

Academic Program Review

Biology, Geology and Environmental Science

Undergraduate Program Self-Study Report

Academic Years 2018-2023

Table of Contents

0 Undergraduate Preface and History	4
0.1 Current Overview of the Department.....	4
0.2 History of Department Organization.....	4
0.3 History of Department Facilities.....	4
0.4 History and Overview of Academic Programs	7
0.5 Summary of Factors Significantly Affecting the Department’s Mission	11
0.6 Previous Undergraduate Program Review, 2018	18
1 Learning Outcomes.....	21
1.1 Learning Outcomes	21
1.2 Evidence Used to Evaluate Achievement	41
1.3 Use of Learning Outcomes for Program Improvement.....	44
1.4 Strategic Plan Alignment	44
1.5 Overall assessment of strengths and weaknesses related to learning outcomes, assessment, major field exams, surveys, and graduate placement	47
2 Undergraduate Curriculum	50
2.1 Curriculum Review and Improvement.....	50
2.2 Course Scheduling and Progress Toward Degrees	61
2.3 Pedagogical and Technological Innovations to Enhance Student Learning	63
2.4 Curriculum Alignment with Program and Student Learning Outcomes.....	67
2.5 Curriculum Content and Current Standards, Practices, and Issues in the Discipline.....	67
2.6 Analytical and Critical Thinking and Problem Solving in the Curriculum.....	68
2.7 Degree Program Designs Provide Students with Solid Foundation.....	69
2.8 Curriculum Progression, Depth, and Rigor.....	70
2.9 Written and Oral Presentation of Results and Ideas	71
2.10 Discipline-Specific Research Strategies.....	72
2.11 Assessment of Curriculum Strengths, Weaknesses, and Recommendations for Change.....	74
3 Student Experience	77
3.1 Student Evaluation.....	77
3.2 Student Exposure to Professional and Career Opportunities	78
3.3 Student Application of Learning Outside the Classroom.....	84
3.4 Student Exposure to Diverse Perspectives and Experiences.....	85
3.5 Student Access to Appropriate Academic Support Services	90
3.6 Department Narrative, Strengths, Weaknesses, and Recommendations for Improvement.....	92
4 Faculty	94
4.1 Faculty Credentials and Quality of Teaching.....	94
4.2 Faculty Number, Workload Expectations, and Teaching Needs.....	100
4.3 Faculty Diversity	111

4.4 Faculty Evaluation System and Faculty Improvement	113
4.5 Faculty Professional Development.....	115
4.6 Faculty Engagement in Planning, Evaluation, and Improvement Processes that Measure and Advance Student Success.....	116
4.7 Assessment of Faculty Strength, Weaknesses and Recommendations for Change	117
4.8 Recommendations for change.....	119
5 Learning Resources.....	121
5.1 Evaluation and Improvement of Equipment and Facilities	121
5.2 Learning and Support Resources to Support Teaching and Learning	129
5.3 Assessment of Learning Resources Strengths, Weaknesses, and Recommendations for Change	137
6 Support.....	141
6.1 Program Budget and Needs	141
6.2 Program Enrollment and Graduation Rates	144
6.3 Program Responsiveness to Local, State, Regional, and National Needs	145
Appendices.....	148

0 Undergraduate Preface and History

0.1 Current Overview of the Department

The Department of Biology, Geology, and Environmental Science (BGE) is one of the largest departments within the College of Arts and Sciences (CAS) at the University of Tennessee at Chattanooga (UTC), offering the BS Biology, BS Geology, BS Environmental Science, and MS Environmental Science degrees. In Fall 2023, the department has more than 800 undergraduate students and 35 MS ESC students with 35 full-time faculty members, two faculty members with administrative appointments, a faculty member with dual appointment in Computer Science and BGE, a department head from another discipline (Chemistry) and three full-time staff. BGE enrolls 22% of the CAS undergraduate majors, which is 8.1% of all UTC students (Fall 2023 data). We also serve other students who have degree requirements that include our coursework (such as Chemistry, Physics, and Psychology), department minors, general education, and service classes for Pre-Nursing, Pre-Physical Therapy, Pre-Occupational Therapy, and Pre-Physician Assistant students. UTC is composed of four colleges (Arts and Sciences, Business, Engineering & Computer Science, and Health, Education & Professional Studies) with a total undergraduate enrollment of 9,982 in Fall 2023. CAS is the largest of the colleges with a Fall 2023 undergraduate enrollment of 3,729. UTC is a public Doctorate/Professional Classification with the additional voluntary/elective Community Engagement Classification.

0.2 History of Department Organization

The department has been reorganized several times in the last 50 years. Prior to 1974, the Department of Biology and the Department of Geology and Geography existed separately with various BA and BS degrees. In 1974, The Environmental Studies degree was created in the Department of Biology, but it was moved to Interdisciplinary Studies in 1978. In 1985, Environmental Studies joined Geology, and then in 1992, it was reunited with Biology as the Department of Biological and Environmental Sciences, converting “Studies” to “Sciences”. In that same year, Geology merged with Physics and Astronomy. In 2015, UTC underwent a campus-wide budget rebalancing which resulted in our current structure, Department of Biology, Geology, and Environmental Science (BGE).

The goal of the BGE merger was to create a unified department that maintains and promotes disciplinary identities, strengths, and resources. BGE consists of one integrated department with three divisions, representing the degree programs: Division of Biology, Division of Geology, and Division of Environmental Science. The divisions are intended to help preserve the disciplinary identity, prestige, and potential of our four degree programs. The merger followed a plan developed by the department and approved by UTC upper-level administrators. The disciplinary differences between Geology and the other two divisions are more distinct than the differences between Biology and Environmental Science. Since our last review, all three disciplines have expanded to work more collaboratively. A detailed timeline of the reorganization and facility locations is shown in Figure 0.1

0.3 History of Department Facilities

During the last 50 years, Biology and Environmental Science (BES) has been located in Holt Hall. Geology was in Grote Hall in the 1970s and then moved to Bretske Hall in 1981. In 2010, following a renovation, Geology moved back to Grote Hall as a part of the Department of Physics, Geology, and Astronomy. Holt Hall was renovated between 2016 and 2019, and the Biology and Environmental Science Divisions moved back into the building during Summer 2019.

0.3.1 Biology and Environmental Science Facility History

Holt Hall was constructed in 1976 and shared with the Departments of English, Philosophy and Religion, and Psychology. Rapid enrollment growth began in the mid-2000s, and BES quickly outgrew its space in Holt Hall. In 2010, BES received additional space in nearby Grote Hall, consisting of three teaching laboratories, one research laboratory, two storage rooms, and two instructor offices. Despite this additional

space, two new tenure-track faculty who joined the department in 2012 were forced to use temporary office and research laboratory space in Collins Street Annex, a separate modular building.

In 2012, due to extreme enrollment growth and deteriorating conditions in Holt Hall, BES was informed that a new life sciences building would be constructed to house the two programs. However, UTC pivoted to develop plans to renovate Holt Hall and assign all space in Holt Hall to BGE. The Holt Hall renovation proceeded in two phases.

Phase I began in May 2016 and involved vacating and renovating the west end of the building. During phase I, BGE faculty were in five separate academic buildings on campus (Holt, Grote, Davenport, Collins Lab Annex, Collins Office Annex). Phase I was completed July 12, 2018. Moving into the renovated space occurred immediately. After Phase I, there were several spaces in which faculty were moved to their final location (they would not have to move after Phase II was complete). However, several faculty did have to move again once Phase II was complete. Punch list items for Phase I were worked on during the following 1-2 years. Phase II began soon after and was completed in June/July 2019. Final moves occurred in the last week of June and first couple weeks of July 2019. At this point, everyone had moved from Davenport Hall and the Collins Annexes to Holt Hall. Of course, for both phases, things were still being worked on/installed while we were occupying the spaces. For both 2018 and 2019, there was a big crunch time between when IT was installed in the classrooms and when the semester started. IT was working in the classrooms throughout August. The punch list from Phase II was ongoing until Fall 2021. This was in large part due to the COVID pandemic. When everything shut down, punch list items could not continue. The Holt Hall renovation had few direct impacts on the Geology faculty and program.

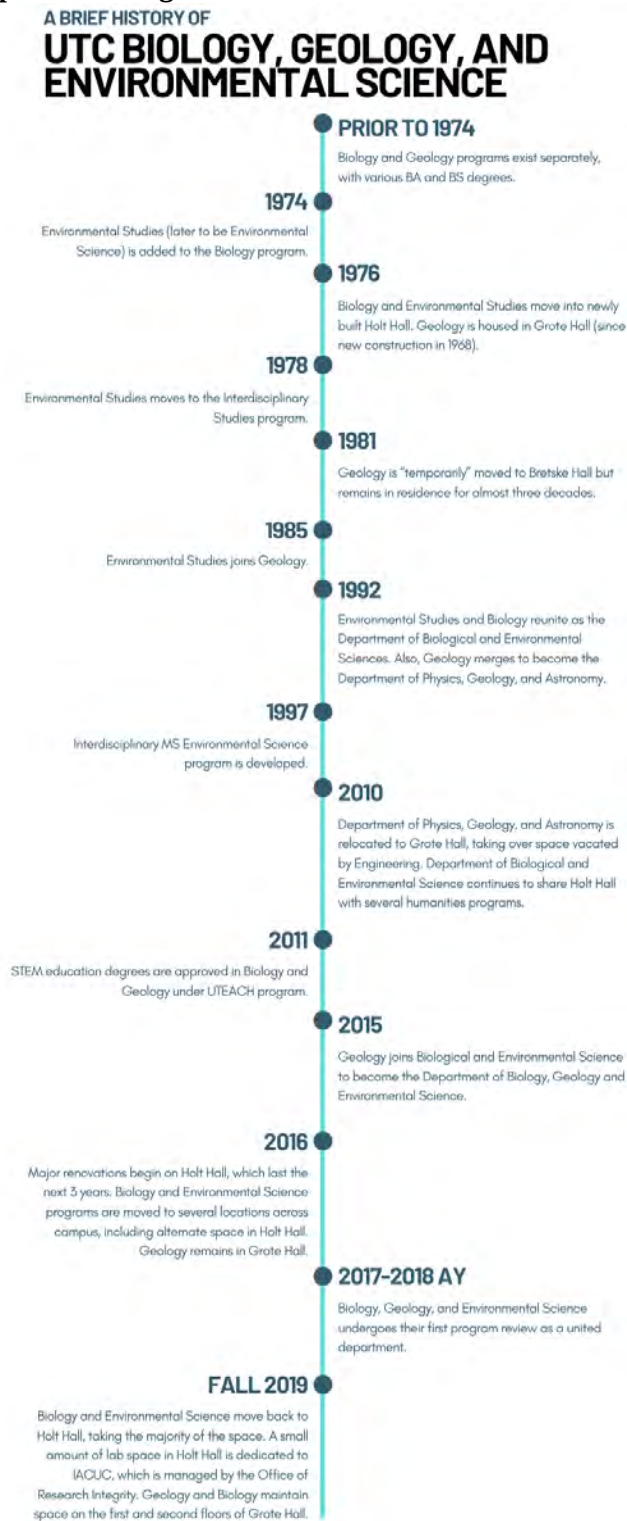
0.3.2 Geology Facility History

Geology moved to the newly built Grote Hall in 1968. In 1981, Geology was displaced from Grote Hall to Bretske Hall, which was meant to be its temporary residence. For nearly three decades, the three to four faculty of the program, a limited support staff, and the laboratory, teaching, and rock preparation and storage space of the program occupied this small, reconfigured dining hall. From 1992 to 2010, the Department of Physics, Geology, and Astronomy was also encumbered by having its constituent programs scattered in widely separated buildings. This was an era of sorely inadequate facilities for the Geology Program and a fragmented academic department.

The 1980's also included a collapse of the oil and gas industry, which precipitated hard times for Geology Programs everywhere. Low enrollments lingered through the turn of the century and made Geology Programs at many institutions susceptible to being eliminated, merged, or modified in response to repeated budget cuts. Remarkably, the Geology Program at UTC is one of few undergraduate-only Geology Programs in the southeastern United States to have survived these difficult times. Many others became more encompassing geoscience degree programs, in which Geology is one of several options.

In Fall 2010, the Geology Program came full circle to reoccupy a refurbished Grote Hall. With this move, the program went from 6,300 square feet of poorly configured floor space, that of a dining facility, in Bretske Hall, to nearly 8,000 square feet of custom-configured floor space in Grote Hall. In the last 13 years, the Geology Program has added two additional research labs on the first floor of Grote. They have also expanded to five tenure track faculty and two non-tenure track faculty. The most recent hire, a structural geologist, has a research lab on the third floor of Holt Hall. The Geology Program has outgrown its expanded space in Grote Hall, and future growth of the program will be limited.

Figure 0.1 Timeline of Department Organization.



0.4 History and Overview of Academic Programs

The department offers BS Biology, BS Geology, BS Environmental Science, and MS Environmental Science degrees. Each degree has several concentrations. More information about the specific concentrations can be found in **Section 2. Curriculum**.

In Fall 2023, BGE enrolled 816 undergraduate students and 30 graduate students. As of Fall 2023, the department has 35 full-time faculty members. There are two additional tenured faculty members with full-time administrative appointments, and a faculty member with dual appointment in Computer Science, all who have limited teaching responsibilities in BGE. In addition, the BGE department head is a tenured faculty member from another discipline (Chemistry). A detailed breakdown of the 35 full-time faculty is as follows:

- 21 Tenure Track (18 BES and 4 Geology)
- 11 Non-tenure Track (9 BES and 2 Geology)
- 3 Non-Tenure Track who are Visiting Faculty (all BES)

Twenty-nine of the full-time faculty are in the Divisions of Biology and Environmental Science and six of the full-time faculty are in the Division of Geology. Several of the non-tenure track faculty also serve additional roles as lab coordinators, including the Anatomy/Physiology Lab Coordinator, the Microbiology Prep Lab Coordinator, and the Introductory Biology Lab Coordinator.

Three full-time staff members support the department: an administrative assistant (Wendy Salazar), an accounting specialist (Kelly Locke), and a faculty associate (Jessica Sanders). The administrative assistant provides general administrative support (communications, copy room, supplies, etc.) and processes travel for all faculty. The accounting specialist administers payroll, personnel paperwork, and manages accounts for state, gift, grant, and scholarships (50-60 separate accounts). The faculty associate is responsible for ordering, safety, equipment, and space.

In total, this is 38 full-time faculty and staff, with three additional tenured faculty who have limited teaching responsibilities. More detail on the faculty and support staff is included in **Section 4. Faculty**. Academic advising for first-time first-year students is managed by the Center for Academic Support and Advising (CASA). After the first year, academic advising in BES is managed by two full-time advisors in the College of Arts and Sciences Advising HUB (Joseph McCauley and Rachel Weibel). Academic advising for Geology is managed by the Geology faculty.

We have seven graduate teaching assistantships (GTAs) funded by the university and one funded by our department online fees. These GTAs are used in various assignments of full-time and half-time to support our graduate students. For Fall 2023, there were five full-time GTAs and four half-time GTAs. Of note, since the last review, the number of funded GTAs from the university has decreased from 11 to 7.

The graduate teaching assistants are supervised by faculty and teach Introductory Biology and Environmental Science laboratories. Adjunct faculty primarily teach Introductory Biology, Geology, and Environmental Science lectures and laboratories as well as non-major general education courses such as Life on Earth (BIOL 1050), Conservation of Biodiversity (BIOL 1100/ESC 1100), Geology of the National Parks (GEOL 1025), and Natural Hazards (GEOL 1030).

All tenure-track (TT) faculty are expected to teach, engage in scholarly activity, and provide university, community, and professional service. All non-tenure-track (NTT) faculty are expected to teach and provide university, community, and professional service. Some of the NTT faculty do participate in research and administration of student internships. Most upper-level undergraduate and graduate classes and laboratories are taught by tenure-track faculty. Occasionally, an upper-level or graduate class will be taught by qualified non-tenure track faculty and adjunct faculty. Teaching loads for tenure-track faculty typically range from

about 7-10 contact hours per semester, while teaching loads for non-tenure track faculty are typically 12 contact hours per semester. Teaching load and workload are discussed in **Section 4. Faculty**.

0.4.1 Biology Program and Degrees

The Biology curriculum has been revised several times over the years. Prior to Fall 1996, the 38-hour Biology major required one course each from a list of courses within the following areas - Botany, Zoology, Population, Chronology, and Physiology. A Molecular area was also included and required students to select two courses from its listing of courses. In Fall 1996, the curriculum was revised to add concentrations to the Biology major. Five concentrations were added - General Biology, Preprofessional, Ecology, Organismal, and Molecular. Within each concentration students were asked to select from one to four courses from offerings listed in four areas - Botany, Zoology, Ecology & Evolution, and Cell & Physiology. A sixth concentration intended to provide future K-12 science teachers with a solid foundation in biology – UTeaChattanooga – was added later. The curriculum also included a BS degree in Medical Technology. The program curricular configuration was either a three plus one program where students spent three years taking relevant university courses at UTC followed by a final year in a clinically based program or a two plus two program where students spent two years at UTC followed by two years in a clinically based program. Although initially successful, the absence of a hospital-based clinical program in Chattanooga diminished the attractiveness of this program to Chattanooga area students due to the added expense of living away from home. The program eventually ended.

Biology enrollment nearly doubled between 2007 and 2013, leading to serious problems caused by the complex curriculum, too few faculty, overwhelming student advising loads, and the inability of the department to offer enough spaces in high demand “bottleneck” courses. In 2013, the curriculum was revised to address these problems. A key change was the reduction from six concentrations to three concentrations. The current undergraduate Biology curriculum requires students to complete general education courses, a common set of required core courses, and a program of study in General Biology, Preprofessional (Pre-medical, Pre-dental, Pre-vet), or STEM Education. Between 2018-2023 (since the last review), there were not any major changes made to the curricula. However, in Fall 2023, a major curriculum change was approved by the department that broadens the course selection and we hope will help reduce persistent bottlenecks. It should also allow students to focus their coursework in an area that will support their postgraduate career or further studies. This change is detailed in **Section 2. Curriculum**.

Biology is one of the largest academic programs at UTC. During the review period, the program has averaged 641 majors and 135 graduates per year. The number of majors has decreased by 175 students over the last five years. This is mainly due to the decrease in students selecting the Pre-Professional Concentration. In fact, the General Biology Concentration has slightly increased. We attribute this decrease in Pre-Professional majors to improved Pre-Health advising and university retention efforts. The university now employs an Assistant Director for Pre-Health Professions. She manages more than 1,000 students who are interested in health careers after graduation. In addition, UTC and CAS have centralized advising. With more focused advising efforts, specifically on retention, students change their major to something better suited to their career goals but are still being retained by the university. Biology has an average retention rate of 59% which is below the average UTC retention rate of 77.6% over the same period. Table 0.1 contains these data for each year of the review period.

Table 0.1 Biology Enrollment and Student Success

Number of	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
Majors (all concentrations)	729	699	647	595	537
General	204	183	218	229	212
Pre-Professional	508	505	416	355	308
STEM	17	11	13	11	5
Graduates (all concentrations)	128	103	125	121	112
General	52	38	35	59	51
Pre-Professional	75	63	88	59	59
STEM	1	2	2	3	2
Biology Retention Rate	59%	59%	60%	61%	57%
CAS Retention Rate	77.6%	78.2%	78.3%	77.0%	N/A
UTC Retention Rate	71.3%	76.7%	73.1%	72.5%	74.3%

0.4.2 Environmental Science Program and Degrees

The Environmental Studies (later to be Science) undergraduate degree was developed in 1974 and became part of the Biology Department. The BS Environmental Studies degree was offered in the 1975-1976 catalog. In 1978, Environmental Studies moved to the Department of Interdisciplinary Studies. In 1985, Environmental Studies joined Geology and Geography. A redistribution of these programs occurred in 1992 and Environmental Studies joined a new Department of Biological and Environmental Sciences. In 1993-1994, the BS Environmental Science degree was offered with eight concentrations in Biology, Chemistry, Engineering Science, Geography, Geology, Mathematics, Physics, and Sociology-Anthropology.

During the 1970s, the department proposed an MS in Biology Program. However, UTC and the University of Tennessee system rejected this proposal, as the Tennessee Higher Education Commission was concerned with program proliferation at the state level. Subsequently, due in part to strong demand in the Chattanooga region, the department proposed an MS in Environmental Science Program that was approved in 1997. The MS program is a broad multidisciplinary program encompassing student research projects ranging from molecular biology studies to environmental policy analysis and remains the only MS Environmental Science Program in Tennessee. More information about this degree can be found in the 2023-2024 MS Environmental Science self-study document.

The BS Environmental Science curriculum was implemented in 2014 and again in 2020 to reconfigure the curriculum, eliminate low enrolled programs, and reduce bottlenecks. Three additional programs were created during these revisions. The current undergraduate BS Environmental Science curriculum requires students complete general education courses and a common set of core courses, and has six concentrations to fit the interests and careers of the students:

- Biodiversity, Conservation, and Natural Resources
- Earth, Atmosphere, and Geological Resources
- Environmental Health
- Environmental Policy and Planning
- Geographic and Cartographic Sciences
- Natural Resource Administration and Enforcement

The Environmental Science program is continuing to grow at UTC. During the review period, the program has seen an average of 234 majors and 21 graduates per year. Environmental Science also has an average retention rate of 69% which is below the UTC retention rate of 74% over the same period. Table 0.2 contains these data for each year of the review period.

Table 0.2 Environmental Science Enrollment and Student Success

Number of	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
Majors	193	231	242	234	268
ESC Graduates	11	15	21	16	44
Environmental Science Retention Rate	64%	73%	69%	64%	73%
CAS Retention Rate	77.6%	78.2%	78.3%	77.0%	N/A
UTC Retention Rate	71.3%	76.7%	73.1%	72.5%	74.3%

Due to the growth in the Environmental Science program, the desire to recruit for the master's program, and a new initiative by the Tennessee Higher Education Commission, Environmental Science developed a Joint Undergraduate to Masters Program (JUMP). This was approved by BGE in Fall 2022 and first appeared in the 2023-2024 undergraduate catalog. Termed TADPOLES (Transformative Academic Development Program on Learning Environmental Science), this combined undergraduate and graduate program allows a current environmental science undergraduate to complete courses that will count towards both an undergraduate and graduate degree. Applications to the combined undergraduate to graduate program is limited to 10 admitted students per academic year, and must comply with all program specific requirements. An undergraduate student may submit their application for review during their junior year. Admission to the program is contingent upon approval of the Environmental Science Graduate Program Director, and the Dean of the Graduate School; and, the student will be admitted to the TADPOLES program as a rising senior, after completion of 90 credit hours. With the permission of the Environmental Science Graduate Program Director, a student may enroll in up to a total of nine hours of graduate course work which will count towards the undergraduate degree and the graduate degree. All undergraduate students must complete their undergraduate major requirements prior to graduation. All graduate courses for which a grade of B or better is earned may be applied to the graduate degree program, provided the student completes the academic program and submits a course substitution for the graduate hours. Any grade lower than a B may only be applied to the undergraduate program. More information on TADPOLES can be found in the [2023-2024 Undergraduate Catalog](#).

0.4.3 Geology Program and Degrees

The University of Chattanooga, predecessor to the University of Tennessee at Chattanooga (UTC), first offered a Bachelor of Arts (BA) degree in Geology in 1939. The BA degree was replaced by the Bachelor of Science (BS) degree in 1980. Two degree options, Geology (BS Geology: Geology) and Environmental Geology (BS Geology: Environmental Geology), were introduced in 2001. A third degree option, STEM education (BS Geology: STEM Education) was added in 2011, shortly after UTC began its UTeach (UTeaChattanooga) Program.

In Fall 2022, the Geology curriculum underwent a significant revision resulting in changes reflected in the 2023-2024 Undergraduate Catalog with goals to

- increase the number of majors in the program,
- update the curriculum according to changes in the field, and
- incorporate the expertise of new faculty in the curriculum.

There are now six concentrations in the BS Geology degree, but more importantly, changes were made to early course curriculum to help with recruitment of students who take non-major geology courses as well to help with roadblocks. These are detailed in **Section 2. Curriculum**. The six Geology concentrations are Geology, Environmental Geology, STEM Geology, Hydrogeology, Geoarchaeology, and Geospatial Science. The Geology curriculum also supports degree programs in Biology, Environmental Science, Civil Engineering, Environmental Engineering, Computer Science, and Middle Grades Education; it provides for a minor in Geology, and some of its courses are certified to satisfy general-education requirements of the university.

This constitutes a strong 84-year history of preparing geologists and geoscience educators for their professional endeavors. The Geology curriculum is currently taught by four TT faculty, two NTT faculty, and three adjunct faculty. We are currently searching to replace an additional TT faculty member who resigned from her position in Summer 2023. The four TT faculty bring a remarkable breadth of expertise to the program, including environmental geology, geographic information systems and geospatial analysis, geomorphology, hydrology, igneous and metamorphic petrology, mineralogy, oceanography, paleontology, petroleum geology, remote sensing, sedimentary petrology, soil science, stratigraphy, structural geology, tectonics, and x-ray diffraction. By virtue of their collective experiences, these faculty also bring knowledge of regional geology to the program. In North America, this includes the Appalachians, the Basin and Range, the Colorado Plateau, and the Rocky Mountains. Elsewhere, this includes western Australia, the Bahamas, Central America, east Africa, the Pyrenees, and Southeast Asia.

Today, Geology is a strong academic program at UTC. During the review period, the program has seen an average of 43 majors and 10 graduates per year. Geology also has an average retention rate of 74% which is below the UTC retention rate of 77.6% over the same period. Table 0.3 contains this data for each year of the review period.

Table 0.3 Geology Enrollment and Student Success

Number of	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
Majors	50	49	45	31	40
GEOL Graduates	16	4	10	6	16
Geology Retention Rate	71%	61%	82%	77%	78%
CAS Retention Rate	77.6%	78.2%	78.3%	77.0%	N/A
UTC Retention Rate	71.3%	76.7%	73.1%	72.5%	74.3%

0.5 Summary of Factors Significantly Affecting the Department's Mission

In 2007, student enrollment in Biology, Geology, and Environmental Science programs began increasing dramatically. By 2013, enrollment in these programs had doubled, and by 2018 the growth trend had leveled off. Between 2018-2023, Biology enrollment decreased, Environmental Science enrollment increased, and Geology enrollment remained constant. The department maintained its teaching, research, and service productivity during the 5-year review period, despite substantial space limitations due to the renovation, budget limitations, and insufficient numbers of faculty and support staff. These factors continue to be opportunities for improvement for the department.

0.5.1 Enrollment

The shift in the number of majors and non-majors taking Biology, Geology, and Environmental Science courses has significantly affected the department's ability to perform its teaching mission. In Fall 2017, BGE enrolled 760 Biology majors, 192 Environmental Science majors, and 44 Geology majors. In Fall 2023, BGE enrolled 537 Biology majors, 268 Environmental Science majors, and 40 Geology majors. The decrease in Biology majors is mainly attributed to an improvement in advising for the Biology Preprofessional Concentration. However, enrollment in Preprofessional service courses has remained consistent over this time, indicating these pre-health students are being retained at UTC, but choosing a different major, see Table 0.4.

Table 0.4 Introductory Biology Enrollment

Enrollment	Fall 2017	Fall 2023
BIOL 1110	580	588
BIOL 1120	114	110
BIOL 1130	149	136
Total	843	834

The department offers multiple courses that are certified for university general education science credit. The courses with asterisks (*) can count towards the major.

- Life on Earth (BIOL 1050/1050L)
- Conservation and Biodiversity (BIOL/ESC 1100)
- Principles of Biology I (BIOL 1110)*
- Principles of Biology II (BIOL 1120)*
- Introduction to Environmental Science I (ESC 1500)*
- Introduction to Environmental Science II (ESC 1510)*
- Geology of the National Parks (GEOL 1025)*
- Natural Hazards (GEOL 1030)*
- Earth's Resources and the Environment (GEOL 1040)*
- Earth and The Environment Lab (GEOL 1105L)
- Physical Geology (GEOL 1110/1110L)*
- Historical Geology (GEOL 1120/1120L)*
- Global Climate Change: Past, Present, and Future (GEOL 2200)
- Oceanography (GEOL 2250)*

The department increased its offerings of BIOL 1050/L and BIOL/ESC 1100 during the review period by increasing the number of lecture sections and offering online sections.

There has been a marked increase in enrollment in our Biology general education lectures and labs, but a small decrease in Environmental Science and Geology general education. Overall, the total number has increased, see Table 0.5. This is mainly due to an addition of Life on Earth, BIOL 1050/L, which is offered asynchronously online. This course is always full, and we have tried to offer more seats each semester to meet the growing demand.

Table 0.5 General Education Enrollment

Enrollment	Fall 2017	Fall 2023
BIOL Gen Ed Lecture Only	78	110
BIOL Gen Ed Lecture/Lab	777	933
ESC Gen Ed Lecture Only	120	139
ESC Gen Ed Lecture/Lab	212	168
GEOL Gen Ed Lecture Only	302	292
GEOL Gen Ed Lecture/Lab	235	191
Total	1724	1833

Due to the increase in Environmental Science majors, we have noticed some roadblocks in the curriculum. Specifically, each concentration requires a methods course from a selection of three courses, Air and Water Pollution Control, Limnology, or Environmental Survey Methods. Due to course prerequisites, most of the students select Air and Water Pollution Control. This course consistently has a waitlist each semester it is offered. In addition, some ESC concentrations require Ecology Lab (BIOL 3070) which is an elective for BIOL majors. Thus, due to the increase in ESC students, we have seen an increase in waitlists for this course as well.

Though enrollment in the major courses for Geology has been consistent, we have a growing problem with Introductory Geographic Information Systems and Remote Sensing (GEOL 2100). This course is required for all Geology and Environmental Science majors as a part of their core courses. The growing number of Environmental Science majors, and the expectation that enrollment will continue to grow will create an increase in the course waitlist. We are currently offering 60 spots every fall but anticipate growth in Fall 2024. Though we have faculty expertise to cover growth, it will shift their teaching away from introductory geology courses.

For Biology majors, one of the limiting factors is available seats in the category courses: Survey, Advanced Ecology and Evolution, and Cell and Physiology. Each semester, we strive to offer enough seats based on predictions from the previous year. However, it can be difficult to schedule class times that do not conflict in such a large department.

Since our last external review, the renovation of Holt Hall has helped improve some of our scheduling issues related to lab space. With the addition of three classrooms that each seat 48 students, we have accommodated larger lectures within our building facilities and taught lectures and labs in the same building. We still have challenges related to staffing which are impacted by limited redundancy in faculty expertise. The geology faculty do not have any redundancy in the TT faculty.

0.5.2 Staffing and Consistent Department Leadership

In 2017, BGE had 30 full-time faculty members, 25 in the Divisions of Biology and Environmental Science and five in the Division of Geology. From 2007 to 2017, Biology and Environmental Science full-time faculty only increased from 17 to 25, representing about a 47% increase in faculty numbers. This was an overall student to faculty ratio of about 38:1 and a student to tenured/tenure-track faculty ratio of over 53:1.

As of Fall 2023, BGE has 35 full-time faculty, 29 in the Divisions of Biology and Environmental Science and six in the Division of Geology. This is a 40% increase over the last six years, which is better than the decade before. When looking at Full-Time Equivalency (FTE), the overall student to faculty ratio is about 24:1, but the student to tenured/tenure-track faculty ratio is 37:1. If the current searches are considered, the student to TT faculty ratio is a little better at 34:1. According to the [National Center for Education Statistics](#), the national public 4-year FTE ratio is 13.7 and the state of TN public 4-year FTE ratio is 13. Even with the increase in faculty that we have had since the last review, these numbers highlight the continuing problem. The department needs additional TT and NTT faculty to teach courses and meet student demand.

Geology also suffers from insufficient faculty, although the problem manifests differently. While the student to faculty ratio is much lower in the Geology Division, due to the much smaller size of the program, faculty are hard pressed to offer courses required for students to progress through the Geology major. Although the Geology faculty have expanded their research space since our last review, they have had historically higher teaching loads than the BES faculty, which results in less time to devote to scholarly activity.

BGE also needs several academic staff to assist full-time faculty with important tasks including animal care, large equipment maintenance, greenhouse management, teaching and learning garden management, and natural history collections management. We currently use lab fees to provide hourly pay for a few graduate students to support the natural history collections. We also enroll undergraduate students in individual studies to participate in animal care, teaching and learning garden management, and natural history collections management.

In addition to the modest changes in the number of instructional positions in the department, the program has experienced turnover in personnel since its last program review:

- Four TT faculty retired. All these positions were searched during the last year of service for the retiring faculty member.
- One TT faculty passed away. This occurred in Fall 2022, and we are in an active search to replace this position; it is currently filled with a visiting lecturer.
- Two TT faculty resigned. One of these positions is in active search, the second is filled with a visiting assistant professor.
- One staff member retired, and the replacement staff member (hired within a month) resigned after 18 months (about one and a half years) in the position. This was a 12-month staff position dedicated to teaching introductory geology labs. This position was converted to a 9-month lecturer position and has been searched and filled.
- The faculty associate/lab coordinator resigned to take another position on campus. The position was split into two positions: a 12-month faculty associate staff and a 9-month lab coordinator lecturer.

The faculty associate position was immediately filled, and the lab coordinator is filled with a visiting lecturer.

The TT faculty hired over the review period increased capacity in cell and physiology and brought fresh expertise and interests; however, one of the new faculty members has since resigned. New TT faculty have added areas of expertise to the department that were previously unrepresented, including: evolutionary ecology of meiofauna, population genomics, biology and biodiversity of fishes, urban ecology using insects as a model, using chemical sedimentary rocks to investigate the geochemical composition of Earth surface environments, hydrology and aqueous geochemistry, and coupling GIS and remote sensing techniques with numerical models to better understand our physical environments and the impact of human-environment interactions.

In this review period, the department underwent changes in leadership. Department Head John Tucker was promoted to a 2-year interim appointment as Associate Dean in Fall 2018. At that time, Dr. Hope Klug was promoted to Department Head. Dr. Klug stepped down in December 2019. Dr. Tucker returned to lead the department in Spring 2020 but continued his role in the college office through June 2020. He subsequently served as BGE Department Head for an additional year. During this period, COVID occurred, and two external Department Head searches were conducted in 2020 and 2021. Both searches failed. In Summer 2021, Dr. Gretchen Potts joined the Department in the head role. She is a tenured Chemistry professor who has previous leadership experience as the Co-Director of the School of Professional Studies and the Program Director of Integrated Studies. The intent was for Dr. Potts to serve as interim Department Head for one year while a third (and hopefully final search) took place. The Dean hired an external search firm, but unfortunately, the search was unsuccessful. Dr. Potts agreed to continue in her role for an additional two years with service ending in Summer 2024. Since that time, Dr. Potts has agreed to extend her tenure as Department Head to Summer 2027.

0.5.3 Space and Facilities

Insufficient, poorly designed, and degraded space negatively impacted BGE's teaching, student learning, and research mission during the previous review period. Since the Holt Hall renovation, BGE has expanded into the entire building. The renovation began in May 2016 and was complete in Summer 2019. The increase in square footage was significant: 29,445 sq. ft. (pre-renovation) to 57,777 sq. ft. (after-renovation). The space was almost doubled between Holt and Grote Halls. Unfortunately, many of the labs were not redesigned (benches were not replaced, facilities were not upgraded). Holt Hall pipes (that were not replaced) continue to cause problems with blockages and low water pressure. Grote Hall, renovated in 2010, has consistent window leaks. There are also problems with humidity (constant leaking from HVAC) in the first-floor labs, which include Anatomy and Physiology. Our spaces are currently full, without any room for expansion. Overall, BGE's teaching, student learning, and research mission continues to be impacted by the building limitations that are an opportunity for improvement.

0.5.4 Budget, Carry-Over, and Start-up

As with previous reviews, the operating budget continues to negatively impact BGE's teaching, student learning, and research mission. Since the department merger in 2015, the budget has not changed significantly, just an increase of \$2,737. Per the [CPI Inflation Calculator](#) on the US Bureau of Labor and Statistics website, the fiscal year 2016 budget, applied July 1, 2015, has the same buying power as \$141,851.32, if applied July 1, 2022.

Two years ago, the UT Board of Trustees approved a lab fee increase that doubled the lab fee from \$25 per course to \$50 per course. This has helped immensely, and we have been able to apply the lab fees to cover salaries for student lab assistants for some of the upper-level labs in all disciplines. We also use lab fees to pay the graduate students who are helping with collections management.

BGE enrolls about 22% of CAS undergraduate majors and about 8.1% of UTC majors. We also offer numerous general education and service courses. The current BGE operating budget is 9.4% of all CAS

operating budgets and 5.3% of operating budgets under Academic Affairs. This does not include salaries, lab fees, or F&As. Table 0.6 shares a budget comparison from prior to the merger in 2015-2016 to 2022-2023. The University does not have a consistent policy in place to allow departments to carryover funds (unless they are restricted), which makes it difficult to plan for future purchases. Neither Academic Affairs nor the Vice Chancellor for Research have funds allocated for startup. Every faculty recruitment is difficult because we must negotiate with the Dean who has a shrinking budget. In the last few years, startups have been generous due to funds made available through offset of federal COVID support funds. Moving forward, this will be a persistent issue. BGE's budget and critical need for substantial increases in funding for department operations, support staff, and major equipment maintenance, repairs, and purchases, is presented in greater detail in **Part 6. Budget.**

Table 0.6 Budget Comparison and Other Factors

Year	2015-2016	2022-2023
BGE Majors (BS and MS)	996	881
FTE Faculty	33.41	37.06
BGE Degrees Awarded (BS and MS)	188	183
BGE Operating Budget	\$114,263	\$117,000
Percent of CAS Operating Budget	12%	9.4%
Percent of Academic Affairs Operating Budget	5.9%	5.3%

0.5.5 Effects of COVID

COVID followed the 4-year Holt Hall renovation that spread BGE faculty, labs, and classrooms among five campus buildings. The COVID pandemic that emerged in Fall 2019 and continued through 2021 occurred when BGE was already experiencing disruptions to program continuity, development, communication, and cohesiveness between faculty and students caused by the renovation. The COVID pandemic exacerbated these challenges and caused additional negative impacts to students, faculty, staff, and administrators at the department and institutional level.

The COVID period was characterized by constantly evolving societal, health, community, and university policies that created uncertainty for faculty, staff, students, and administrators. Like many other institutions, UTC had periods of mandatory masking, COVID testing, limited access, closure, and campus reintegration. Generally, UTC policies emphasized accommodation of students, faculty, and staff individual and family needs (such as child or elder care) and health during this period. The transition to online course delivery coupled with the expectation that faculty accommodate all student circumstances required considerable additional work effort by faculty, staff, and administrators and impacted other areas of responsibility, as well as faculty personal and family health in some instances. Several specific impacts of the COVID pandemic are described below:

- **Travel:** UTC adopted a travel ban for faculty and students, with very limited exceptions. This impacted faculty research, development, and presentation opportunities. Student field trips were also prohibited, which impacted student learning.
- **On Campus Access:** UTC prohibited faculty and students from being on campus, with limited exceptions for essential research activities.
- **Faculty Access Exemptions:** Faculty were required to request permission to access labs and offices to conduct research and other activities. This was a time-consuming process for faculty and department staff and administrators.
- **Student Access Exemptions:** Faculty had to complete a COVID-19 Student Access Exception Request Form justifying an exception for students, which was subject to approval by the department head, dean, and vice-chancellor for research. This was a time-consuming process for faculty and department administrators.

- **Budget:** The BGE budget was frozen as part of a university wide budget freeze, and departments were required to hold back funds should there be a substantial enrollment decline, legislative pullback of funds, or other unanticipated budget shortfalls or necessary expenditures.
- **Student Orientation:** On-campus orientation sessions were cancelled. BGE Head Tucker, Associate Head Brock-Hon, and faculty member Craddock developed a script and recorded a video at the UTC TV studio to provide incoming students with an online orientation to the department. The video replaced the traditional face-to-face orientation during the COVID situation.
- **Faculty and Staff Work from Home Agreements:** Faculty and staff were required to complete work from home agreements subject to approval by the BGE Head, CAS Dean, and Human Resources. This was a time-consuming process for faculty and department administrators.
- **Office Equipment:** Faculty were authorized to take certain UTC equipment home when campus closed (e.g., computers, printers, monitors, desk, chair) and BGE developed a system to track this equipment.
- **Faculty Searches:** Two nearly completed BGE searches to fill a new biology lecturer position and a new geology lecturer were put on hold in March 2020. Search committee members had already received OEI training, reviewed candidate materials, completed Zoom interviews, and selected candidates to invite for on campus interviews.
- **Student Awards Banquet Cancellation:** COVID prevented the department from holding its awards dinner in 2020 and 2021. Nonetheless, the department's Student Awards & Relations Committee identified student recipients for scholarship and recognition awards provided by the department and SGA. BGE faculty reviewed and approved awards and scholarships for 23 outstanding BGE students. Each student was sent an award letter from the head and a framed award certificate.
- **Purchasing:** COVID slowed down purchasing from many vendors. This was time-consuming for the BGE Faculty Associate and required that faculty provide more advance notice of purchase needs.
- **Teaching Lab Improvement:** Faculty were encouraged to request equipment to enhance teaching labs in conjunction with moving back into Holt Hall post renovation. This initiative was hindered by COVID as labs were shifted online and faculty were consumed with the challenges of moving and delivering their classes online.
- **Development:** Normal interactions with Development staff and potential donors did not occur during the year due to COVID. Nonetheless, the BGE Development Committee added a donation tab to the BGE website and obtained a list of over 3,000 alumni from the UTC Development Office. The BGE Newsletter Committee completed a 2020 departmental newsletter and coordinated with the Development Committee to send BGE alumni a link to the electronic newsletter, which included a link to the new clickable tab for donations.
- **Lab Setup and Startup Fund Expenditures:** COVID hampered new faculty expenditures of startup funds to establish research laboratories. The department encouraged several faculty with startup funds to spend their funds if feasible, rather than risk loss of those funds. The department also encouraged those faculty to request extensions if COVID or other factors outside of their control (unfinished labs related to Holt Hall renovation) hindered expenditure of startup funds. Several requests were made and approved by the BGE Head, CAS Dean, and Provost.
- **Online Course Delivery Challenges:** COVID made it very difficult for faculty to teach certain courses. Further, many faculty had no prior experience with online class delivery. When requested by faculty, BGE used bi-weekly funds to pay student teaching assistants to assist faculty with delivery of their courses.
- **Tenure and Promotion Year for Tenure Track Faculty:** Initial appointment letters for TT faculty specify a date by which faculty must apply for tenure and promotion to Associate Professor. Normally, no exceptions are allowed to this mandatory date. UTC Academic Affairs adopted a policy allowing TT faculty to extend this date up to two years to accommodate COVID related hardships. One-year extension requests were automatically approved, while requests for 2-year extensions underwent some review.
- **Course Learning Evaluations:** UTC faculty are evaluated by students in every course they teach. For the COVID years, UTC Academic Affairs suspended consideration of course learning

evaluations by department heads in the annual Evaluation and Development by Objectives (EDO) evaluation, and by Reappointment, Tenure, and Promotion (RTP) Committees and administrators making faculty reappointment, tenure, and promotion decisions.

- **Peer Evaluation of Faculty Instruction:** The Department RTP committee continued to implement the BGE Peer Evaluation of Instruction program for all faculty during their first two years of teaching, despite COVID. Tenured faculty attended virtual lectures and completed an evaluation form provided to new faculty. This may have been unfair, given that the university suspended student teaching evaluations during the pandemic, and the faculty undergoing review had little or no online teaching experience. BGE Bylaws require certain narrative ratings (Excellent or Very Good) during the 3-year period prior to tenure and promotion consideration, and new faculty being peer-reviewed may have been disadvantaged by online evaluations during COVID.
- **Faculty Travel Support Funds:** BGE policy requests that faculty submit internal Faculty Development Proposals, Scholarship, Engagement, the Arts, Research, Creativity, and Humanities (SEARCH) awards (with students), Center of Excellence in Applied Computational Science and Engineering (CEACSE) awards, CAS Faculty Achievement Award (FAA), and Research and Creative Activity (RCA) awards to augment BGE funds to support research and travel to present research findings at scientific meetings, as well as CAS Summer Collaborative Project Awards. In spring 2020, internal awards were halted due to COVID.
- **Shift from Face-to-Face to Online Teaching Modalities:** Most classes in BGE have historically been taught face-to-face. Not surprisingly, most faculty encountered challenges converting from face-to-face to online modalities in such a short timeframe. This change proved particularly challenging for several large enrollment introductory classes. As mentioned above, the department used bi-weekly funds to hire student teaching assistants to help faculty struggling to deliver classes. BGE also approved all requests to purchase classroom technology to support faculty teaching. Further, UTC's Walker Center for Teaching and Learning provided online and real-time phone support to faculty regarding online course delivery and use of Canvas and Zoom. The UTC Library provided microphones to record lectures. When faculty and students began on-campus reintegration, the library also provided remote microphones and equipment to amplify faculty voices constrained by masks and facilitate connectivity to recording devices.
- **Field Stations:** Due to COVID there was no activity regarding the Wisdom Street Wetland, Tennessee River Aquatic Field Station, the Volunteer Army Ammunition Plant (VAAP) upland site, and the VAAP wetland field sites.
- **Online Course Delivery Transition back to Face-to-Face:** In Fall 2021, we transitioned back to on-campus courses taught primarily face-to-face. The UTC course delivery policy evolved from purely online, to hybrid, to face-to-face. Some courses involved face-to-face instruction with simultaneous Zoom and recorded lectures to accommodate students that missed both deliveries with COVID-related absences. This was a very time-intensive period for faculty that demanded enhanced teaching effort and reduced the time available for student mentoring, research, and service.
- **Campus Reintegration Plan:** UTC required BGE and other departments to develop a Student and Faculty On-campus Reintegration Plan subject to UTC approval. Each classroom and lab had to be measured, and reduced capacities and seating locations were determined based on UTC Safety and Academic Affairs guidelines. BGE developed COVID Safety Protocols for all public spaces (halls, front office, classrooms). BGE also adopted BGE COVID Lab Protocols for teaching and research labs that included a Prohibition on Unsupervised Student Access. The BGE Student and Faculty On-campus Reintegration Plan and BGE COVID Lab Protocols are included in appendices [Appendix 0-A](#) and [Appendix 0-B](#), respectively.
- **BGE Travel and Photocopying Expenditures:** Due to COVID, BGE travel and photocopying expenditures were down approximately 75%, which relieved normal BGE budget shortfalls. In all other years, BGE has had to cover shortfalls from BGE gift funds or additional CAS funds.
- **Lab Fee Expenditures:** Lab fee money is essential to achieve the teaching mission of the department. During AY 2020/2021, BGE generated approximately \$90K in lab fees. This money was used to support the teaching of laboratory courses, including purchase of supplies, equipment, and

instruments. The money was also used to cover other expenses related to teaching laboratories such as equipment maintenance contracts, equipment repairs, and hourly pay of student laboratory workers. Due to fewer face-to-face lab sections than normal, expenditures were lower. This was limited to the COVID pandemic years, as the department has always needed all lab fee funds to deliver its laboratory courses with no reserve for instrument maintenance and repair or significant upgrades or improvements.

While COVID impacts were overwhelmingly negative, there were a few short-term and long-term benefits. As noted above, BGE expenditures were lower in certain budget categories during the pandemic. These short savings ended with the campus reintegration of students and faculty. Long-term, the COVID pandemic required faculty to become knowledgeable and proficient with online and hybrid course modalities and electronic meetings. While the face-to-face modality will remain the predominate course delivery approach in the natural and physical sciences, BGE faculty are collectively more adept and accepting of alternate modalities. Electronic meetings, via Zoom or Teams, are much more common, although there remains an overall preference for face-to-face meetings when possible.

0.6 Previous Undergraduate Program Review, 2018

The Biology, Geology, and Environmental Science Department undergraduate and graduate programs were reviewed in Spring 2018 by Dr. Marta Wayne (University of Florida, Biology), Dr. Stephen MacAvoy (American University, Environmental Science), and Dr. Thomas Hickson (University of St. Thomas, Geology). The undergraduate and graduate program reviews were intertwined. Therefore, included is a summary of the reviewer comments for all programs. The reviewers identified strengths and shortcomings of the BGE programs and made several specific recommendations.

The reviewers' general comments for all the undergraduate programs included:

BGE has an exceptionally strong, caring, and productive faculty. Our overall impression is of a faculty that is deeply committed to their students and teaching, while fully embracing the teacher/scholar model. New lab and teaching spaces that will come online shortly will also be a strong asset to the program. We also believe that the merger between geology, biology and environmental science is a real strength, combining these natural science disciplines and allowing for far greater interdisciplinary synergies to flourish. If the faculty can work together to support each other across all three divisions and to reject silo-based thinking, the potential for growth in geology and environmental science may be significant.

The specific recommendations were that:

Geology and Biology faculty need to focus on how they are both very similar, natural science disciplines that strive for the same basic objective: to teach students how to be effective scientists that can address real societal problems and work toward the common good. They need to view the Environmental Science program as their shared responsibility and look for ways for all interested faculty to participate. The disproportionate numbers of Biology faculty can lead to a tyranny of the majority, which should be avoided at all costs. BGE needs to think of creative solutions, documented in their by-laws, to assure that Geology faculty have a strong voice.

The major strength of the Geology program is the incredibly hardworking, caring, passionate and dedicated faculty. They have been working under a very difficult teaching load for over a decade at least, yet they continue to have a positive attitude and support their majors in myriad ways. They have created a program that prepares their majors for careers in geosciences and graduate school. They are a tight knit, very supportive group that exhibits remarkably little tension between them. They really seem to enjoy working together and this creates an esprit d 'corps' that impacts the entire department.

The senior capstone experience is another shining light in this program. It is well thought-out and provides an exceptional learning experience for their majors. This is evidenced by the success of their graduates, who seem to be more than prepared for careers.

Geology has been an exceptionally “good citizen” at the university. The department seeks to support university initiatives, goes out of its way to perform excellent assessment, and has maintained an exceptionally positive attitude during the merger into the BGE Department. Furthermore, Geology faculty have been excellent and conservative stewards of university resources.

Perhaps the single biggest weakness that impacts all aspects of the program is that faculty are significantly overloaded with teaching. As a result, faculty research programs have suffered. This has negative implications for student-faculty collaborative research engagement, creativity in course delivery, community outreach efforts, success in getting external funding, staying abreast of the current status of their field (which negative impacts teaching at all levels), and, perhaps most importantly, faculty morale.

Other weaknesses include:

- Lack of access to computer technology in the department, particularly in introductory courses. We do not feel that it is adequate to have Geology faculty use the SIM center, which is prohibitively far from their teaching and office spaces, has limited student access, and is not really designed for this type of use.
- A tendency to not “toot their own horn.” Faculty need to get the word out about the exciting things they are doing and the relevance of their field.

The goals for the next five years recommended by the reviewers included:

1. Make a stronger effort to pursue community-based and interdisciplinary research and teaching experiences.
2. Consolidate Geology space to allow for some existing space to support research.
3. Teaching equity: Lower teaching load for Geology faculty by switching lab teaching to TAs (additional TAs needed on top of the 11 currently funded).
4. Incorporate more technology (such as GIS and modeling) into all undergraduate labs, particularly in Geology. GIS should be required in the graduate program.
5. Create two GA positions to care for the greenhouse and other infrastructure.
6. Eliminate faculty committee and advising requirements for MS students not on a thesis track. A single internship advisor would administer the internship (external, student driven learning) and receive teaching credit.
7. Eliminate the Learned Discourse. To earn an MS, students should be able to navigate an internship successfully or conduct independent thesis research.
8. Restructure the student fees. The fees right now are about $\frac{1}{3}$ of the graduate TA stipend. Student morale would be improved if the fees were eliminated.
9. Consider offering a GIS certificate as part of the undergraduate program. Students from any division should be able to do this if they wish.
10. Consider developing more shared and flexible lab spaces in the remodeled building.

BGE has worked to address the 5-year goals.

1. BGE has expanded community-based and interdisciplinary research and teaching over the review period. We have faculty who have co-taught courses in the Honors College (Amazing Biology of Fishes with Alda and Klug) and within the department (Paleontology with Bramblett and Manning-Berg). On campus, we have research collaborations with several UTC disciplines, including mathematics, engineering, computer science, sociology, anthropology, political science/public service, and chemistry. Within the community, BGE collaborates in teaching and research with

numerous entities, including the Chattanooga Audubon Society, Reflection Riding Arboretum and Nature Preserve, Lula Lake, TVA, EPB, Chattanooga Zoo, Tennessee Aquarium, Chattanooga Parks and Outdoor Recreation, City of Chattanooga, North Chickamauga Creek Conservancy, Raccoon Mountain Caverns, Great Smoky Mountains National Park, Hamilton County Schools, Highland Biological Station, and the Environmental Protection Agency.

2. Rather than consolidate Geology space, more space was identified for research. There are two additional labs on the first floor of Grote. In addition, the newest TT professor whose area of research is in structure and petrology, received research space on the 3rd floor of Holt Hall.
3. We have worked to lower the teaching load for Geology faculty, but results have been inconsistent. The Geology faculty has revised the curriculum (effective 2023-2024 catalog), which should promote student progression to graduation and reduce loads. We have also begun using lab fees to pay undergraduate students to help with lab preparation. Additionally, we have paid graduate students (per hour) to assist during labs.
4. GIS has been developed into a certificate on campus (IGTLab). It is also a major and a minor in the Geology program. A new introductory GIS course (GEOL 2100 - Introductory Geographic Information Systems and Remote Sensing) is now required for all Environmental Science and Geology majors. This replaced a Maps and Mapping course in the curriculum. We do not have the capacity in the upper-level GIS courses to accommodate this as a requirement for all graduate students, but many of the students do take the advanced courses. We would need to hire an additional GIS faculty member if we were to require the courses of all graduate students.
5. We have lost four graduate teaching assistant (GTA) positions over the review period, so we have not been able to convert GTA positions to help with infrastructure. We are using laboratory fees to pay graduate assistants per hour to help in those capacities.
6. The faculty committee for internship has been eliminated. There is not an overall internship advisor, but individual faculty serve as internship advisors.
7. Learned discourse has been eliminated.
8. Fees are controlled by the UTC administration and the UT-System Board. However, during the review period, there were significant changes to the out-of-state fees which benefited graduate students. Now, there is a discount for regional tuition credit, which applies to students who are residents of Catoosa, Dade, Fannin, Murray, Walker and Whitfield counties in Georgia and Jackson County in Alabama (counties around the borders of Tennessee).
9. We now offer a GIS minor. There is also a GIS certificate that is offered through the IGTLab (it is not an academic certificate).
10. We have two lab spaces that are shared in renovated Holt Hall. One was used by two faculty until most recently when one of the faculty resigned. The other space is being used by a new geology hire and will be available for expansion space for an additional faculty member.

1 Learning Outcomes

The current vision, mission and values of the department were developed in a strategic plan dated 11/09/2018.

Vision: Building on the unique strengths of our faculty, staff, and students, we will be leaders of and advocates for innovative teaching, scientific discovery, and service.

Mission: We are educators and scientists who embrace creativity, intellectual freedom, high academic standards, and diversity of thought and culture. Our mission is to 1) inspire students to become productive, responsible, and engaged members of the scientific community and society, 2) advance the fields of biology, geology, and environmental science by engaging in innovative research and scholarship, 3) be locally and globally engaged scientists who promote education in our community and worldwide, and 4) expand and enhance diversity and inclusivity in the sciences.

Values: Faculty, staff, and students in Biology, Geology, and Environmental Science value:

- Broad scientific education that promotes an appreciation and deep understanding of the natural world
- Freedom of scientific thought
- The scientific process and effective dissemination of knowledge
- Integrity and collegiality
- Cultural diversity and inclusivity of people, thoughts, experiences and talent
- Community and global engagement

The BGE Department established a new strategic plan in 2018. The detailed goals of the plan are found in [Appendix 1-A](#)).

1.1 Learning Outcomes

1.1.1 Biology Learning Outcomes and Assessment

The department established new student learning outcomes (SLOs) in 2014, and these were evaluated until the Spring 2023 semester, when the department updated its curriculum maps for Biology ([Appendix 1-B](#)). These changes corresponded to revised SLOs listed in the following text. We began evaluating these Biology learning outcomes in Fall 2023. The primary mode of assessment is through our classes. Secondly, we rely on other parameters such as ETS Major Field Test, institutional surveys, and informal surveys of students.

1.1.1.1 Biology Learning Outcomes

These student learning outcomes (SLOs) for Biology, as presented below, were established during the 2014-2015 academic year, and were implemented through Spring 2023.

1. Students are able to demonstrate knowledge of and differentiate among the different levels of biological organization (e.g., chemicals, cells, tissues, organs, organ systems, organisms, populations, communities, ecosystems, and biosphere).
2. Students are able to demonstrate knowledge of the three core areas of Biology (ecology, evolution, and genetics) and apply their knowledge to studies of various taxonomic groups (e.g., insects, fishes, mammals, fungi, vascular plants).
3. Students are able to apply their knowledge of cells and organ systems in a variety of biological contexts.

4. Students are able to demonstrate proper laboratory/ field techniques, formulate appropriate questions and hypotheses, collect laboratory/field data, and analyze collected data in a variety of biological contexts.
5. Students are able to communicate biological information effectively.
6. Students are able to retrieve specific information from the scientific literature and are able to evaluate the literature effectively and critically.
7. Students are able to conduct themselves responsibly and recognize the importance of ethical professional behavior.

The following Biology student learning outcomes were approved by the department in Spring 2023 and were implemented in Fall 2023. We hope this streamlined version of outcomes will allow us to better track strengths and opportunities for improvement.

1. **Core Knowledge.** Students demonstrate understanding of core concepts in the discipline as they apply to various levels of biological organization (i.e., from molecules to ecosystems) and taxonomic groups (e.g., viruses, prokaryotes, plants, fungi, insects, fishes, reptiles, birds, mammals, etc.), including structure and function, genetics, evolution, and ecology.
2. **Resources and Tools.** Students use scientific resources to collect biological information, including the literature base, established methodologies and technologies, laboratory and field equipment, and/or computational tools.
3. **Scientific Process.** Students ask and address biological questions by developing hypotheses, designing and conducting relevant empirical and/or theoretical tests, and critically analyzing and interpreting results.
4. **Communication and Engagement.** Students disseminate biological information in various formats (i.e., oral, written) and engage with various audiences (i.e., scientific, general) as is essential to career development in the discipline.

1.1.1.2. Biology Learning Outcomes Assessment

The Biology Learning Outcomes Assessments for the past two cycles (2021-2022, and 2022-2023) were reported in *Anthology - Planning*. Pertinent parts of those reports, including assessment data, are shown in Table 1.1. Overall, since 2021, we have assessed six learning outcomes and 15 classes. Of all these classes, we only had one instance where the criteria for success were not met, and the instructors took follow-up measures. Starting in Fall 2023, we are using revised assessment questions. The new SLO assessment schedule is in [Appendix 1-C](#).

Table 1.1 Assessments of Student Learning Outcomes in the Biology Program for 2021-2022 and 2022-2023.

SLO	Measures and Assessment
Outcome 1. Students are able to demonstrate knowledge of and differentiate among the different levels of biological organization (e.g., chemicals, cells, tissues, organs, organ systems, organisms, populations, communities, ecosystems, and biosphere).	Means of assessment: Student performance on specific exam questions and/or embedded coursework. Criteria for Success: At least 70% of the students will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: BIOL 1130, BIOL 3350, BIOL 4280 2022-2023: BIOL 1130, BIOL 3350, BIOL 4280 2023-2024: not to be assessed. Assessment Data: 2021-2022: BIOL 1130: Question 1: 91.8% correct response; Question 2: 83.6% correct response; BIOL 3350: 67.3% correct (average of 16 questions); BIOL 4280: 84.3% correct (average of 5 questions) 2022-2023: not assessed Follow up actions planned: We are assessing new SLOs, no follow up action planned.
Outcome 2. Students are able to demonstrate knowledge of the three core areas of biology (ecology, evolution, and genetics) and apply their knowledge to studies of various taxonomic groups (e.g., insects, fishes, mammals, fungi, vascular plants).	Means of assessment: Student performance on specific exam questions and/or embedded coursework. Criteria for Success: At least 70% of the students will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: not assessed 2022-2023: BIOL 2080, BIOL 3070, BIOL 4090, BIOL 4190 2023-2024: not to be assessed. Assessment data: 2021-2022: not assessed 2022-2023: BIOL 2080: 74% correct (1 question); BIOL 3070: 93.5% average score on assignment; BIOL 4090: 79.8% average score; BIOL 4190: 72% answered question correctly 2023-2024: not to be assessed Follow up actions planned: We are assessing new SLOs, no follow up action planned.

Outcome 3. Students are able to apply their knowledge of cells and organ systems in a variety of biological contexts.	Means of assessment: Student performance on specific exam questions and/or embedded coursework. Criteria for Success: At least 70% of the students will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: not assessed 2022-2023: BIOL 3250 2023-2024: not to be assessed. Assessment data: 2022-2023: BIOL 3250: Question 1: 96% correct, Question 2: 100% correct, Question 3: 75% correct, Question 4: 92% correct, Question 5: 72% correct, Question 6: 72% correct. Follow up actions planned: We are assessing new SLOs, no follow-up action planned.
Outcome 4. Students are able to demonstrate proper laboratory/field techniques, formulate appropriate questions and hypotheses, collect laboratory/field data, and analyze collected data in a variety of biological contexts.	Means of assessment: Student performance on specific exam questions, lab practicals and/or embedded coursework. Criteria for Success: At least 70% of the students will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: not assessed 2022-2023: BIOL 1110L, BIOL 3260 2023-2024: not to be assessed. Assessment data: 2022-2023: BIOL 1110L: 91% correct; BIOL 3260: 2 lab reports (average = 91.2%) Follow up actions planned: We are assessing new SLOs, no follow-up action planned.

Outcome 5. Students are able to communicate biological information effectively.	Means of assessment: Student performance on specific exam questions, presentations, writing assignments and/or embedded coursework. Criteria for Success: At least 70% of the student will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: not assessed 2022-2023: not assessed 2023-2024: not to be assessed. Assessment data: not assessed Follow up actions planned: We are assessing new SLOs, no follow up action planned.
Outcome 6. Students are able to retrieve specific information from the scientific literature and are able to evaluate the literature effectively and critically.	Means of assessment: Student performance on specific exam questions, writing assignments, oral presentations and/or embedded coursework. Criteria for Success: At least 70% of the students will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: BIOL 1120, BIOL 2100, BIOL 4140 2022-2023: not assessed 2023-2024: not to be assessed. Assessment data: 2021-2022: BIOL 1120: Question 1: 83.3% correct, Question 2: 69% correct; BIOL 2100: Assignment, 86.7% average score; BIOL 4140: Assignment, 86.7 average score. Follow up actions planned: We are assessing new SLOs, no follow-up action planned.
Outcome 7. Students are able to conduct themselves responsibly and recognize the importance of ethical professional behavior.	Means of assessment: Student performance on specific exam questions and/or embedded coursework, student conduct in classroom. Criteria for Success: At least 70% of the students will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: BIOL 3060, BIOL 3070 2022-2023: not assessed 2023-2024: not to be assessed. Assessment data: 2021-2022: BIOL 3060: 1 Question, 42% average score; BIOL 3070: Question 1: 96% average score, Question 2: 92% average score, Question 3: 85% average score Follow up actions planned: We are assessing new SLOs, no follow up action planned.

1.1.1.3 Biology Student Performance on Major Field Tests

Student scores on the ETS Biology Major Field Test (MFT), a standardized exam measuring student knowledge in biological sciences, can be used as indicators to evaluate achievement of the older Biology Program outcomes (Criterion 1.2) and used to strengthen program effectiveness (Criterion 1.3). To measure the BS Biology Program outcomes and effectiveness, MFT scores of UTC Biology students (graduating seniors) were compared against scores in a national database.

The major field test (MFT) schedule is determined by the Tennessee Higher Education Commission (THEC) ([Appendix 1-D](#)). According to the MFT schedule, the ETS Biology Major Field Test was administered to graduating senior Biology majors (n=105) during the 2020-2021 academic year. In 2020-2021, the average UTC ETS Biology Field Test scores aligned with the national average, with the total score at 96.4% of the national average and sub-scores ranging from 89% to 92% of the national average ([Appendix 1-E](#)).

1.1.1.4 Sample Biology Syllabi

Sample course syllabi for Biology courses are provided in [Appendix 1-F](#).

- BIOL 1110L, Principles of Biology I Lab
- BIOL 1120, Principles of Biology II
- BIOL 2060L, Functional Human Anatomy Lab
- BIOL 3060, Ecology

1.1.2. Environmental Science Learning Outcomes and Assessment

The department established new SLOs in 2014, and these were evaluated until the Spring 2023 semester, when the department updated its curriculum maps for Environmental Sciences ([Appendix 1-G](#)). These changes corresponded to revised SLOs listed in the following text. We will begin evaluating these new Environmental Science learning outcomes in Fall 2023. The primary mode of assessment is through our classes. Secondly, we rely on other parameters such as a department written Major Field Test, institutional surveys, and informal surveys of students.

1.1.2.1 Environmental Science Learning Outcomes

These student learning outcomes for Environmental Science, as presented below, were established during the 2014-2015 academic year and were implemented through Spring 2023.

1. Students are able to demonstrate knowledge of the natural world, within the context of key issues of Environmental Science (including human population increase, urbanization, sustainability, resource depletion, and environmental pollution).
2. Students are able to demonstrate knowledge of core areas of Environmental Science (including ecology, survey methodology, environmental resources, environmental law and policy, and environmental ethics) as they exemplify the interdisciplinary nature of the field.
3. Students are able to apply their knowledge towards addressing environmental problems, in a manner consistent with recognizing the unique role humans play in the environment.
4. Students are able to formulate research questions and/or hypotheses, utilize appropriate methodologies, and collect and analyze data toward addressing their questions and/or hypotheses within an environmental context.
5. Students are able to communicate Environmental Science information effectively.
6. Students are able to retrieve specific information from the relevant literature and are able to evaluate the literature effectively and critically.
7. Students are able to conduct themselves responsibly and recognize the importance of ethical professional behavior.
8. Students are able to competently and professionally complete an applied capstone course (senior experience) that stresses experiential learning.

The following Environmental Science student learning outcomes were approved by the department in Spring 2023 and will be implemented in Fall 2023. We hope this streamlined version of outcomes will allow us to better track strengths and opportunities for improvement.

1. **Core Knowledge.** Students demonstrate interdisciplinary knowledge of core areas of environmental science (e.g., ecology, natural resources, law and policy, ethics, etc.) as they apply to understanding the natural world and addressing environmental issues, including human population growth, resource depletion, urbanization, pollution, and sustainability.
2. **Resources and Tools.** Students use resources within an environmental science context to collect information, including the literature base, established methodologies and technologies, laboratory and field equipment, and/or computational tools.
3. **Scientific/Research Process.** Students ask and address questions in environmental science by developing questions and/or hypotheses, designing and conducting relevant investigations with empirical, theoretical, and/or conceptual tests, and critically analyzing and interpreting results.
4. **Communication and Engagement.** Students disseminate environmental science information in various formats (i.e., oral, written) and engage with various audiences (i.e., scientific, general) as is essential to career development in the discipline.

1.1.2.2 Environmental Science Learning Outcomes Assessment

The Environmental Science Learning Outcomes Assessments for the past two cycles (2021-2022, and 2022-2023) were reported in *Anthology - Planning*. Pertinent parts of those reports, including assessment data, are shown in Table 1.2. Overall, since 2018, we have assessed six learning outcomes and 10 classes. Among all these classes, we only had three instances where the criteria for success were not met and each of the instructors took follow-up measures. We are using new student learning outcomes in 2023-2024. The new SLO assessment schedule is in [Appendix 1-C](#).

Table 1.2 Assessments of Student Learning Outcomes in the Environmental Science Program for 2021-2022 and 2022-2023.

SLO	Measures and Assessment
Outcome 1. Students are able to demonstrate knowledge of the natural world, within the context of key issues of environmental science (including human population increase, urbanization, sustainability, resource depletion, and environmental pollution).	Means of assessment: Student performance on specific exam questions and/or embedded coursework. Criteria for Success: At least 70% of the student will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: not-assessed 2022-2023: ESC 1500, ESC 2500 2023-2024: not to be assessed. Assessment data: 2022-2023: [cumulative scores for all questions, unless otherwise noted]. ESC 1500 20 SLO questions (83.5% correct); ESC 2500 2 SLO questions (94.5% correct) ESC 1510, Question 1: 85.7%, Question 2: 71.4%. BIOL 3060, [two sessions] Overall assessment 69% Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.
Outcome 2. Students are able to demonstrate knowledge of core areas of environmental science (including ecology, survey methodology, environmental resources, environmental law and policy, and environmental ethics) as they exemplify the interdisciplinary nature of the field.	Means of assessment: Student performance on specific exam questions and/or embedded coursework. Criteria for Success: At least 70% of the students will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: not assessed 2022-2023: ESC 4070 2023-2024: not to be assessed. Assessment data: 2022-2023: ESC 4070 Question 1: 67% correction, Question 2: 78%, Question 3: 75% Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.

Outcome 3. Students are able to apply their knowledge towards addressing environmental problems, in a manner consistent with recognizing the unique role humans play in the environment.	Means of assessment: Student performance on specific exam questions and/or embedded coursework. Criteria for Success: At least 70% of the students will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: not assessed 2022-2023: not assessed 2023-2024: not to be assessed. Assessment data: not assessed Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.
Outcome 4. Students are able to formulate research questions and/or hypotheses, utilize appropriate methodologies, and collect and analyze data toward addressing their questions and/or hypotheses within an environmental context.	Means of assessment: Student performance on specific exam questions, lab practicals or exercises, and/or embedded coursework. Criteria for Success: At least 70% of the student will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: not assessed 2022-2023: not assessed 2023-2024: not to be assessed. Assessment data: not assessed Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.
Outcome 5. Students are able to communicate environmental science information effectively.	Means of assessment: Student performance on specific exam questions, presentations, writing assignments and/or embedded coursework. Criteria for Success: At least 70% of the students will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: ESC 1500 2022-2023: not assessed 2023-2024: not to be assessed. Assessment data: 2021-2022: ESC 1500: 77.2% correct; ESC 4660: 100% correct; 100% wrote journals, earned A. Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.

Outcome 6. Students are able to retrieve specific information from the relevant literature and are able to evaluate the literature effectively and critically.	Means of assessment: Student performance on specific exam questions, presentations, writing assignments and/or embedded coursework. Criteria for Success: At least 70% of the students will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: ESC 1510, ESC 2500 2022-2023: not assessed 2023-2024: not to be assessed. Assessment data: 2021-2022: ESC 1510: initial: 50% correct; follow-up after further instruction: 97%; ESC 2500: 2 questions, overall 93.7% Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.
Outcome 7. Students are able to conduct themselves responsibly and recognize the importance of ethical professional behavior.	Means of assessment: Student performance on specific exam questions, presentations, writing assignments, conduct and/or embedded coursework. Criteria for Success: At least 70% of the students will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: ESC 1510, ESC 4010, ESC 4840 2022-2023: not assessed 2023-2024: not to be assessed. Assessment data: 2021-2022: ESC 1510: 1 question 77%, ESC 4010: 3 questions, 87%; ESC 4840: 80% Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.

Outcome 8. Students are able to competently and professionally complete an applied capstone course (senior experience) that stresses experiential learning.	Means of assessment: Student performance on specific exam questions, presentations, writing assignments and/or embedded coursework. Criteria for Success: At least 70% of the students will have the correct answers on specific questions designed by instructors to test the specific outcome. Courses Evaluated: 2021-2022: not assessed 2022-2023: ESC 4998 assessed 2023-2024: not to be assessed. Assessment data: 2022-2023: ESC 4998: 100% Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.

1.1.2.3 Environmental Science Student Performance on Major Field Tests

Historically, Environmental Science has not had a Major Field Test, but this has recently changed. Across the last four or so semesters, ESC faculty have been developing and piloting a major field assessment. The first version of the exam was initially constructed in Fall 2021-Spring 2022 by the BS ESC Coordinator, Dr. Bradley Reynolds. The exam drew on many of the core ESC courses, including Introduction to Environmental Science, Principles of Biology, Ecology, Introductory GIS and Remote Sensing, Survey Methods, Environmental Law and Agencies, and Values and the Environment. From there, other faculty were brought in, especially those faculty that teach the core courses to assess and update the exam written by Dr. Reynolds, changing, adding, and subtracting assessment items. Next, outside reviewers were solicited to review and suggest changes (the outside reviewers were Mrs. Jennifer Innes of the Tennessee Department of Environment and Conservation and Dr. Jessica Leet, a research toxicologist with the US Geological Survey). The exam was then submitted to THEC for approval and field testing began with all graduating seniors required to take the exam each fall and each spring. Participation was excellent, given that Dr. Reynolds impressed upon the seniors the importance of the exam as a vehicle that influences the ESC Program's government funding. The exam was first administered in 2022-2023 through Canvas, UTC's online learning management system. The first year is serving as the baseline year for the ESC Major Field Assessment, with the results serving as comparison scores for the 2023-2024 reporting cycle. The pilot scores produced an average of 73.125 out of 100.

1.1.2.4 Sample Environmental Science Syllabi

Sample course syllabi for Environmental Science courses are provided in [Appendix 1-H](#).

- ESC 1510L Introduction to Environmental Science II Laboratory
- ESC 4100 Environmental Law and Agencies
- ESC 1500L Introduction to Environmental Science I Laboratory
- ESC 1500 Introduction to Environmental Science I

1.1.3 Geology Learning Outcomes and Assessment

The department established new SLOs in 2013, and these were evaluated until the Spring 2023 semester, when the department updated its curriculum maps for Geology ([Appendix 1-I](#)). These changes corresponded to revised SLOs listed in the following text. We will begin evaluating these new Geology

learning outcomes in Fall 2023. The primary mode of assessment is through our classes. Secondly, we rely on other parameters such as the Geology ACAT, institutional surveys, and informal surveys of students.

1.1.3.1 Geology Learning Outcomes

These student learning outcomes for Geology, as presented below, were established during the 2013-2014 academic year, and were implemented through Spring 2023.

1. Demonstrate knowledge of fundamental sciences to interdisciplinary studies of the Earth.
2. Apply computational skills to studies of the Earth.
3. Characterize and identify common earth materials (minerals, rocks, fossils, and soils) in situ and in hand specimen.
4. Interpret the genesis of rocks and minerals of common rocks and of common associations of minerals, fossils, and rock structures.
5. Relate imperceptibly slow geologic processes to the enormous scale of geologic time and the energy gradients that drive them.
6. Critically assess geology-related issues that impact society, using their knowledge of geology.
7. Formulate a reasonable model of geologic structure, geologic process, and/or geologic history based on spatially, geometrically and/or temporally related data.
8. Design and conduct geologic research, using their knowledge, skills, and critical thinking abilities.
9. Communicate geotechnical information by written, oral, and graphical means.

The Geology curriculum went through extensive curriculum changes in 2022-2023. As a result, new student learning outcomes were developed and approved by the department in Fall 2022. These new Geology SLOs will be implemented in Fall 2023. We hope this streamlined version of outcomes will allow us to better track strengths and opportunities for improvement.

1. Characterize and identify common geologic materials (e.g. minerals, rocks, fossils, and soils) in field and/or laboratory settings.
2. Describe slow, commonly imperceptible, geologic processes in the context of the enormous scale of geologic time, and the energy gradients that drive them
3. Apply their knowledge of geology and systems thinking to critically assess problems that impact society.
4. Use spatially, geometrically, and/or temporally related data to formulate conceptual and/or computational models to effectively interpret geologic structures, geologic processes, geologic history and/or the genesis and evolution of geologic materials and structures.
5. Demonstrate critical thinking through effective design and execution of geologic research.
6. Effectively communicate geotechnical information by written, oral, and graphical means.

1.1.3.2 Geology Learning Outcomes Assessment

The Geology Learning Outcomes Assessments for the past two cycles (2021-2022, and 2022-2023) were reported in *Anthology - Planning*. Pertinent parts of those reports, including assessment data, are shown in Table 1.3. Overall, since 2018, we have assessed four learning outcomes and 13 classes. Among all these classes, all the criteria for success were met. We have revamped our program learning outcomes with the goal of continuous student improvement in all areas. We will be using new student learning outcomes in 2023-2024. The new SLO assessment schedule is in [Appendix 1-C](#).

Table 1.3 Assessments of Student Learning Outcomes in the Geology Program for 2021-2022 and 2022-2023.

SLO	Measures and Assessment
Outcome 1. Demonstrate knowledge of fundamental sciences to interdisciplinary studies of the Earth..	Means of assessment: Student performance on comprehensive exam or embedded course work Criteria for Success: At least 80% of students will achieve a grade of 60% or better on exam questions or coursework specifically designed to assess this outcome in each of these classes. Courses Evaluated: 2021-2022: not assessed 2022-2023: not assessed 2023-2024: not to be assessed Assessment data: not assessed Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.
Outcome 2. Apply computational skills to studies of the Earth..	Means of assessment: Student performance on comprehensive exam or embedded course work Criteria for Success: At least 80% of students will achieve a grade of 60% or better on exam questions or coursework, specifically designed to assess this outcome, in each of these classes Courses Evaluated: 2021-2022: not assessed 2022-2023: not assessed 2023-2024: not to be assessed Assessment data: not assessed Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.

Outcome 3. Characterize and identify common earth materials (minerals, rocks, fossils, and soils) in situ and in hand specimen..	Means of assessment: Student performance on comprehensive exam or embedded course work Criteria for Success: At least 70% of students will achieve a grade of 60% or better on exam questions or coursework specifically designed to assess this outcome in each of these classes. Courses Evaluated: 2021-2022: not assessed 2022-2023: not assessed 2023-2024: not to be assessed Assessment data: not assessed Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.
Outcome 4. Interpret the genesis of rocks and minerals of common rocks and of common associations of minerals, fossils, and rock structures.	Means of assessment: Student performance on specific exam questions and/or embedded coursework. Criteria for Success: At least 80% of students will achieve a grade of 60% or better on exam questions or coursework specifically designed to assess this outcome in each of these classes. Courses Evaluated: 2021-2022: not assessed 2022-2023: GEOL 4550, Remote Sensing for Geoscientists 2023-2024: not to be assessed Assessment data: 2021-2022: not assessed 2022-2023: 13 out of 15 (87%) students earned a score of 60% or better on this assessment. Two students earned below 60%. Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.

Outcome 5. Relate imperceptibly slow geologic processes to the enormous scale of geologic time and the energy gradients that drive them.	Means of assessment: Student performance on comprehensive exam or embedded course work. Criteria for Success: At least 80% of students will achieve a grade of 60% or better on exam questions or coursework specifically designed to assess this outcome in each of these classes. Courses Evaluated: 2021-2022: not assessed 2022-2023: not assessed 2023-2024: not to be assessed Assessment data: not assessed Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.
Outcome 6. Critically assess geology-related issues that impact society, using their knowledge of geology.	Means of assessment: Student performance on comprehensive exam or embedded course work. Criteria for Success: At least 70% of students will achieve a grade of 60% or better on exam questions or coursework, specifically designed to assess this outcome, in each of these classes. Courses Evaluated: 2021-2022: GEOL 1110L (Physical Geology Lab) GEOL 4530 (GIS for Geoscientists), GEOL 2100 (Introductory GIS and Remote Sensing) 2022-2023: not assessed 2023-2024: not to be assessed. Assessment data: 2021-2022: Introduction of this outcome (#6) was assessed in GEOL 1110L (Physical Geology Lab) during the Spring of 2022. This is the lab for a large general education class populated overwhelmingly by students with majors other than Geology. The assessment was based on Lab #11, the subject of which was Climate Change. Of 144 students, 117 (81%) achieved an average grade of 60% or better. Of 144 students, 118 completed the lab; 26 received a grade of zero for not turning it in. Of 118 students that completed the lab, 117 (99%) achieved an average grade of 60% or better. By all measures, the CFS was substantially exceeded for this assessment. Competency for this outcome (#6) was assessed in GEOL 4530 (GIS for Geoscientists) during the Spring of 2022, based on a combination of questions related to this outcome on both lecture and lab exams.

	Of 12 students in GEOL 4530, all 12 took both lecture and lab exams. Of the 12 students that took both exams, all 12 (100%) achieved a combined score of 60% or better. Of 12 students in GEOL 2100, 9 were geology majors. All 9 geology majors took both exams. All 9 geology majors (100%) achieved a combined score of 60% or better. By all measures, the CFS was substantially exceeded for this assessment. 2022-2023: not assessed Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.
Outcome 7. Formulate a reasonable model of geologic structure, geologic process, and/or geologic history based on spatially, geometrically and/or temporally related data.	Means of assessment: Student performance on comprehensive exam or embedded course work. Criteria for Success: At least 80% of students will achieve a grade of 60% or better on exam questions or coursework specifically designed to assess this outcome in each of these classes. Courses Evaluated: 2021-2022: not assessed 2022-2023: not assessed 2023-2024: not to be assessed Assessment data: not assessed Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.
Outcome 8. Design and conduct geologic research, using their knowledge, skills, and critical thinking abilities.	Means of assessment: Student performance on specific exam questions, embedded coursework, and/or poster or oral presentations. Criteria for Success: At least 70% of students will achieve a grade of 60% or better on exam questions, embedded coursework, and/or poster or oral presentations specifically designed to assess the introduction and practice of this outcome in GEOL 2100 and GEOL 3540. At least 70% of faculty judgements will meet or exceed expectations for research presented by students at the conclusion of GEOL 4900, for each of the performance criteria described in the scoring rubric. Courses Evaluated: 2021-2022: GEOL 2100 (Introductory GIS and Remote Sensing, GEOL 3540 (Sedimentary Rocks and Stratigraphy), and GEOL 4900 (Senior Research Project) 2022-2023: GEOL 4900 (Senior Research Project) 2023-2024: not to be assessed.

	Assessment data: 2021-2022: Introduction of this outcome (#8) was assessed in GEOL 2100 (Introductory GIS and Remote Sensing) during the Fall of 2021, based on a combination of questions related to this outcome on both lecture and lab exams. Of 19 students in GEOL 2100, 17 took both lecture and lab exams. Of the 17 students that took both exams, 13 (76%) achieved a combined score of 60% or better. Of 19 students in GEOL 2100, 5 were geology majors. All 5 geology majors took both exams. All 5 geology majors (100%) achieved a combined score of 60% or better. With respect to the class as a whole, the CFS was met (slightly exceeded). With respect to geology majors, the CFS was substantially exceeded. Practice of this outcome (#8) was assessed in GEOL 3540 (Sedimentary Rocks and Stratigraphy) during the Spring of 2022, based on a project that caused students to identify a particular depositional environment and to consider potential evidence in the rock record that could be used to identify the environment. All 18 students in GEOL 3540 were Geology majors. All 18 students in GEOL 3540 completed the project. Of 18 students that completed the project, 17 (94%) achieved an average grade of 60% or better. By all measures, the CFS was substantially exceeded for this assessment. Competency for this outcome (#8) was assessed in GEOL 4900 (Senior Research Project, formerly Senior Seminar), a capstone course populated entirely by BS Geology students, during the Spring of 2022 by faculty of the Geology Program using a scoring rubric. Eight (8) senior-level BS Geology students completed GEOL 4900 during the Spring of 2022. Percent's (%'s) of 57 faculty judgments that met or exceeded expectations for each research-related criterion are as follows: Criterion#1, Problem to be solved, 93% Criterion#2, Methodology, 98% Criterion#3, Data analysis, 95% Criterion#4, Conclusions, 86% average of 4 criteria, 93.0% The CFS was substantially exceeded for all criteria assessed. 2022-2023: Nine (9) senior-level BS Geology students completed GEOL 4900 during the Spring of 2023.

	Percent's (%) of 44 to 54 faculty judgments that met or exceeded expectations for each research-related criterion are as follows: Criterion#1, Problem to be solved, 93% Criterion#2, Methodology, 89% Criterion#3, Data analysis, NA (see note) Criterion#4, Conclusions, 84% average of 3 criteria, 88.7% The CFS was substantially exceeded for all criteria assessed. Note: Criteria #3 (data analysis) was not explicitly assessed. A variant of the rubric, in which criteria #3 was part of criteria #4, was used. Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.
Outcome 9. Communicate geotechnical information by written, oral, and graphical means.	Means of assessment: Student performance on specific exam questions, embedded coursework, and/or poster or oral presentations. Criteria for Success: At least 70% of students will achieve a grade of 60% or better on exam questions, embedded coursework, and/or poster or oral presentations Courses Evaluated: 2021-2022: GEOL 1110 (Physical Geology), GEOL 4070 (The Dynamic Earth), GEOL 4900 (Senior Research Project) 2022-2023: GEOL 4900 (Senior Research Project) 2023-2024: not to be assessed. Assessment data: 2021-2022 Introduction of this outcome (#9) was assessed in 4 sections of GEOL 1110 (Physical Geology) during the Fall of 2021. This is a large general education class populated overwhelmingly by students with majors other than Geology. The assessment was based on an activity, an assignment, or an exam question that caused students to describe and/or discuss the passage of seismic waves through the layered structure of Earth. In Section 0, 48 of 59 students completed the assessment, 30 (63%) of which achieved a grade of 60% or better. In Section 1, 48 of 61 students completed the assessment, 39 (81%) of which achieved a grade of 60% or better. In Section 2, 53 of 61 students completed the assessment, 40 (75%) of which achieved a grade of 60% or better. In Section 3, 21 of 37 students completed the assessment, 13 (62%) of which achieved a grade of 60% or better. Overall, (4 sections, combined), 122 (72%) of 170 students that completed the assessment achieved a grade of 60% or better.

	The CFS was met or exceeded for this assessment for 2 of the 4 sections and for the total enrollment of all 4 sections. Practice of this outcome (#9) was assessed in GEOL 4070 (Dynamic Earth) during the Spring of 2022, which had a much smaller enrollment than normal. The assessment was based on an exam question that caused students to describe relationships among plate boundary types and a pole of rotation or the significance of the P-wave velocity profile in terms of Earth structure. Of 6 students (total enrollment), only 1 was a geology major. Of 6 students (total enrollment), all 6 (100%) achieved a grade of 60% or better. The single geology major achieved a grade of 80%. The CFS was substantially exceeded for this assessment, for both the class as a whole and for the single geology major. Competency for this outcome (#9) was assessed in GEOL 4900 (Senior Seminar), a capstone course populated entirely by BS Geology students, during the Spring of 2022 by faculty of the Geology Program using a scoring rubric. Eight (8) senior-level BS Geology students completed GEOL 4900 during the Spring of 2022. Percent's (%'s) of 56 faculty judgments that met or exceeded expectations for each research-related criterion are as follows: Criterion#1, Organization, layout, design, 100% Criterion#2, Written communication, 100% Criterion#3, Oral communication, 100% Criterion#4, Graphical communication, 98% Criterion#5, Demonstrated knowledge, 96% Criterion#6, Professionalism, 100% average of 6 criteria, 99.1% The CFS was substantially exceeded for all criteria assessed. 2022-2023 Competency for this outcome (#9) was assessed in GEOL 4900 (Senior Research Project, formerly Senior Seminar), a capstone course populated entirely by BS Geology students, during the Spring of 2023. The assessment was conducted by faculty of the Geology Program using a scoring rubric. Nine (9) senior-level BS Geology students completed GEOL 4900 during the Spring of 2023. Percent's (%'s) of 56 faculty judgments that met or exceeded expectations for each communication-related criterion are as follows: Criterion#1, Organization, layout, design, 100%

	Criterion#2, Written communication, 98% Criterion#3, Oral communication, 100% Criterion#4, Graphical communication, 96% Criterion#5, Demonstrated knowledge, 98% Criterion#6, Professionalism, 100% average of 6 criteria, 98.7% The CFS was substantially exceeded for all criteria assessed. Follow up actions planned: We have developed new student learning outcomes, and these will be implemented in 2023-2024.

1.1.3.3 Geology Student Performance on the Geology Area Concentration Achievement Tests (ACAT) as the Major Field Test

The Area Concentration Achievement Test (ACAT) in Geology was administered as a means of outcomes assessment from 1998-1999 through 2010-2011 and has been administered nearly every year since then as a major field test (MFT). For each assessment cycle, the ACAT was administered as a pretest and as an outcomes (senior) test. Second-year students took the pretest at the start (first week) of Mineralogy (GEOL 3410). Prospective graduates (seniors) took the outcomes test at the conclusion of the program, commonly as students of Sedimentary Rocks and Stratigraphy (GEOL 3540), Structural Geology (GEOL 4510), or Field Methods in Structural Geology (GEOL 4520). Both the pretest and the outcomes test consist of mineralogy, petrology, stratigraphy, and structural geology content areas. Results are reported as normalized standard scores and percentiles for each content area and as overall scores. Standard scores are based on a mean of 500 and a standard deviation of 100. Reference group sizes ranged from 124 to 516.

Overall and content-area scores for the 6-year period of this review (2018 to 2023) are shown in Table 1.4. The percentile rank is provided in parenthesis. Fifty-nine students took the pretest during this period, with a mean of 401 and a mean percentile of 16.6%. During the self-study, there were two years when the senior exam was not given. See the notes in Table 1.4. However, 26 students did complete the test during this period with a mean overall score of 510 and a mean percentile of 54%. This is the same mean overall score from our last self-study, but the percentile has raised by four percentage points.

Table 1.4 Average ACAT Content-Area and Overall Scores for 2018 through 2023. The percentile rank is in parentheses.

Cycle		n	Mineral.	Petrol.	Strat.	Struct.	Overall
2018-2019	pretest	10	130 (24 th)	560 (73 rd)	428 (24 th)	415 (20 th)	426 (23 rd)
	outcomes	13	518 (57 th)	518 (57 th)	503 (51 st)	499 (50 th)	494 (48 th)
2019-2020	pretest	15	391 (14 th)	529 (61 st)	409 (18 th)	411 (19 th)	393 (14 th)
	outcomes		Not available due to COVID				
2020-2021	pretest	15	451 (31 st)	488 (45 th)	416 (20 th)	458 (34 th)	419 (21 st)
	outcomes	7	555 (71 st)	559 (72 nd)	590 (42 nd)	516 (56 th)	510 (54 th)
2021-2022	pretest	6	420 (21 st)	501 (50 th)	441 (28 th)	431 (25 th)	398 (15 th)
	outcomes	6	571 (76 th)	582 (79 th)	553 (49 th)	497 (49 th)	526 (60 th)
2022-2023	pretest	7	367 (9 th)	463 (36 th)	413 (19 th)	467 (37 th)	369 (10 th)
	outcomes		Not available because structure and sed/strat classes were not taught.				

1.1.3.4 Sample Geology Syllabi

Sample course syllabi for Geology courses are provided in [Appendix 1-J](#).

- GEOL 1110L Physical Geology Lab
- GEOL 1120 Historical Geology
- GEOL 3410 Mineralogy
- GEOL 4800 Research Design
- GEOL 4510 Structural Geology
- GEOL 3540 Sedimentary Rocks and Stratigraphy
- GEOL 3420 Petrology
- GEOL 4900 Senior Research Project

1.2 Evidence Used to Evaluate Achievement

1.2.1 Institutional and Informal Department Surveys

UTC's Office of Planning, Evaluation, and Institutional Research administers the National Survey of Student Engagement (NSSE) to students concerning overall satisfaction with their educational experience. Overall, Biology, Geology, and Environmental Science students were satisfied with their educational experience at UTC. Results for 2023 for Biology and Environmental Science are presented in Tables 1.5 and 1.6, respectively. Geology results for 2022 are presented in Table 1.7 as the 2023 survey did not have the minimum level of respondents.

Table 1.5 2023 NSSE results for Biology (numbers are given as percentages).

Question 1: How would you evaluate your entire educational experience at this institution?			
Response Options	UTC (%)	CAS (%)	BIOL (%)
Very little	3.4	4.1	1.8
Sometimes	12.7	10.8	18.2
Quite a bit	51.2	51	58.2
Very much	32.7	34.2	21.8
Question 2: If you could start over again, would you go to the same institution you are attending now?			
Response Options	UTC (%)	CAS (%)	BIOL (%)
Very little	4.3	4.5	0.0
Sometimes	12.6	12.0	14.5
Quite a bit	44.2	43.1	45.5
Very much	39.0	40.4	40.0

Table 1.6 2023 NSSE results for Environmental Science (numbers are given as percentages).

Question 1: How would you evaluate your entire educational experience at this institution?			
Response Options	UTC (%)	CAS (%)	ESC (%)
Very little	3.4	4.1	0.0
Sometimes	12.7	10.8	19.4
Quite a bit	51.2	51.0	51.6
Very much	32.7	34.2	29.0
Question 2: If you could start over again, would you go to the same institution you are attending now?			
Response Options	UTC (%)	CAS (%)	ESC (%)
Very little	4.3	4.5	6.5
Sometimes	12.6	12.0	25.8
Quite a bit	44.2	43.1	35.5
Very much	39.0	40.4	32.3

Table 1.7 2022 NSSE results for Geology (numbers are given as percentages).

Question 1: How would you evaluate your entire educational experience at this institution?			
Response Options	UTC (%)	CAS (%)	GEOL (%)
Very little	2.1	1.6	10.0
Sometimes	16.7	18.3	10.0
Quite a bit	52.4	51.3	40.0
Very much	28.9	29.0	40.0
Question 2: If you could start over again, would you go to the same institution you are attending now?			
Response Options	UTC (%)	CAS (%)	GEOL (%)
Very little	4.3	3.3	10.0
Sometimes	14.0	15.1	10.0
Quite a bit	44.8	46.0	20.0
Very much	36.9	35.6	60.0

Informal summaries of recent graduates of our programs conducted in Fall 2021, Spring 2022, Fall 2022, and Spring 2023 revealed that students valued their BGE experience. Impressions of our faculty, course content, and support systems were generally positive. Critical comments were focused on challenges of learning from online courses during the COVID pandemic, some issues of poor advising, and a perceived lack of emphasis on pre-professional courses. Surveys also revealed that graduates are seeking a diversity of career-enhancing or employment options including pursuing graduate or professional schools, medical-related work (including sales of medical equipment), environmental consulting/advocacy, and animal rehabilitation.

1.2.2 Placement of Students in Graduate and Professional Programs

Department faculty compile a list of all the undergraduate majors that gain admission to graduate or professional programs. This information is voluntary/self-reported by the students and is gathered by faculty members. The original lists include the names of the students and the programs to which they have

been admitted. Tables 1.8, 1.9, and 1.10 summarize these data for the past five years for each program. Each table shows the overall number of undergraduate majors who graduated each year, the number who were admitted to graduate programs, the number admitted to professional programs or discipline-related employment, and the percentage of the total graduates who entered graduate or discipline-related employment. We suspect that employment numbers are falsely low due to self-reporting. This is why the informal survey was implemented by the department head in Fall 2021. Unfortunately, the survey is also not required and as a result, the response rate is only about 20%. New methods for capturing this information need to be implemented, perhaps as a component of major field testing. Beginning in Fall 2023, UTC began asking graduating seniors about post-graduation plans as part of their required senior exit exam. This should improve response rates and provide results that better reflect what students are actually doing once they graduate.

Table 1.8 Graduates in Biology Continuing onto Graduate or Professional Schools.

Year	# Graduating Majors	# Entering Graduate Programs	# (%) Entering Professional Schools/Industry
2018-2019	145	3	13 (11.0%)
2019-2020	128	1	21 (17.2%)
2020-2021	151	0	19 (12.6%)
2021-2022	142	2	17 (13.4%)
2022-2023	110	2	14 (14.5%)

Table 1.9 Graduates in Environmental Science Continuing onto Graduate School or ESC-related Employment.

Year	# Graduating Majors	# (%) Entering Graduate Programs or ESC-related Employment
2018-2019	11	**
2019-2020	15	3 (20.0%)
2020-2021	21	1 (4.8%)
2021-2022	16	2 (12.5%)
2022-2023	44	2 (4.5%)

**Data were not available

Table 1.10 Graduates in Geology Continuing onto Graduate School or Geology-related Employment.

Year	# Graduating Majors	# Entering Graduate Programs or Geology-related Employment	% Entering Graduate or Geology-related Employment
2018-2019	16	1	6.25%
2019-2020	4	3	75.00%
2020-2021	10	**	**
2021-2022	6	2	33.33%
2022-2023	16	3	18.75%

**Data were not available

Given the large number of students in our program, we have not conducted formal surveys of employer satisfaction of our graduates. This is an opportunity for improvement moving forward.

1.3 Use of Learning Outcomes for Program Improvement

In all programs, we assessed all learning outcomes of the last five years. Through those assessments we were able to identify a few areas that required program improvement. For instance, here is a list where the outcomes were not achieved for Biology and Environmental Science over the last two years. All the outcomes were achieved for Geology.

- Biology SLO1: 2021-2022: BIOL 1130: Question 1: 91.8% correct response; Question 2: 83.6% correct response; BIOL 3350: 67.3% correct (average of 16 questions); BIOL 4280: 84.3%
- Biology SLO6: 2021-2022: BIOL 1120: Question 1: 83.3% correct, Question 2: 69% correct; BIOL 2100: Assignment, 86.7% average score; BIOL 4140: Assignment, 86.7 average score.
- Biology SLO7: 2021-2022: BIOL 3060: 1 Question, 42% average score; BIOL 3070: Question 1: 96% average score, Question 2: 92% average score, Question 3: 85% average score
- Environmental Science SLO1: 2022-2023: [cumulative scores for all questions, unless otherwise noted]. ESC 1500 20 SLO questions (83.5% correct); ESC 2500 2 SLO questions (94.5% correct) ESC 1510, Question 1: 85.7%, Question 2: 71.4%. BIOL 3060, [two sessions] Overall assessment 69%
- Environmental Science SLO2: 2022-2023: ESC 4070 Question 1: 67% correction, Question 2: 78%, Question 3: 75%

In all instances, one part of the assessment did not achieve 70%. Those are underlined in the list above. Follow-up measures were taken based on the assessments, however the SLOs have not yet been reassessed so there is not an accounting of how the changes affected learning. Furthermore, we have written new SLOs for all three programs. The intent of the new SLOs is to streamline assessment and allow for more regular tracking of how changes affect student learning.

1.4 Strategic Plan Alignment

1.4.1 BGE Alignment with UTC Strategic Plan

The university's strategic plan is in [Appendix 1-K](#). The BGE programs align well with the university's vision, mission, and values. A comparison of the two is shown in Table 1.11. In terms of Vision, our advocating for innovation, scientific discovery and service aligns well with the university vision for student engagement and inspiring change. In terms of Mission, our departmental aim to inspire and embrace diversity aligns well with the university mission to embrace diversity and inclusion. Our mission also emphasizes the promotion of education that engages and enriches the community. In terms of Values, our efforts contribute to a broad education and nurtures scholarship and innovation. The department's curriculum, student learning outcomes, and expectations align well with the University's strategic plan and BGE embraces the opportunity to improve our department based on the goals of these strategic plans.

Table 1.11 Comparison of UTC's Vision, Mission, and Values to BGE.

Alignment	UTC	BGE
Vision	We engage students, inspire change and enrich community.	Building on the unique strengths of our faculty, staff, and students, we will be leaders of and advocates for innovative teaching, scientific discovery, and service.
Mission	The University of Tennessee at Chattanooga is a driving force for achieving excellence by actively engaging students, faculty and staff, embracing diversity and inclusion, inspiring positive change and enriching and sustaining our community.	We are educators and scientists who embrace creativity, intellectual freedom, high academic standards, and diversity of thought and culture. Our mission is to 1) inspire students to become productive, responsible, and engaged members of the scientific community and society, 2) advance the fields of biology, geology, and environmental science by engaging in innovative research and scholarship, 3) be locally and globally engaged scientists who promote education in our community and worldwide, and 4) expand and enhance diversity and inclusivity in the sciences.
Values	• We believe that students are the reason our institution exists. • We affirm the essential function of a liberal arts education. • We commit to transformational engagement with our community. • We nurture a culture of creativity, scholarship and innovation. • We embrace diversity and inclusion. • We pursue excellence in all that we do. • We live integrity and civility.	Faculty, staff, and students in Biology, Geology, and Environmental Science value: • Broad scientific education that promotes an appreciation and deep understanding • of the natural world • Freedom of scientific thought • The scientific process and effective dissemination of knowledge • Integrity and collegiality • Cultural diversity and inclusivity of people, thoughts, experiences and talent • Community and global engagement

1.4.2 BGE Alignment with CAS Strategic Plan

The College of Arts Sciences (CAS) Strategic Plan is in [Appendix 1-L](#). The vision of the College of Arts and Sciences through its strategic plan is also directly related to our program goals:

“The enduring vision of UTC's College of Arts and Sciences is...to transform lives through a modern liberal arts and sciences education.”

Our program directly relates to the education of sciences majors. Table 1.12 highlights how our programs directly align with College of Arts and Sciences mission and values. In terms of Mission, our departmental mission aligns with the CAS mission regarding advancing knowledge through research, critical thinking, and engagement with a diversity of people. In terms of Values, both the CAS and

department emphasize cultural and intellectual diversity, inclusion, deep understanding, and engagement with the community. Additionally, we value freedom of intellectual expression and scientific thought.

Table 1.12 Alignment of departmental and College of Arts and Sciences mission and values.

Alignment	CAS	BGE
Mission	• provide an environment for intellectual curiosity and a foundation for life-long learning, thinking, reflection, and growth • equip students with transferrable skills—critical thinking, communication, and complex problem solving skills—that are needed to adapt and succeed in a rapidly evolving world • advance cultural and intellectual diversity (<i>e.g.</i>, studying competing theories as well as intellectual advancements within and beyond Western traditions) • advance new knowledge through research (theoretical and applied) and creative activities • advance integrated service as a part of personal and social responsibility	We are educators and scientists who embrace creativity, intellectual freedom, high academic standards, and diversity of thought and culture. Our mission is to 1) inspire students to become productive, responsible, and engaged members of the scientific community and society, 2) advance the fields of biology, geology, and environmental science by engaging in innovative research and scholarship, 3) be locally and globally engaged scientists who promote education in our community and worldwide, and 4) expand and enhance diversity and inclusivity in the sciences.
Values	Faculty, staff, and students in the College of Arts and Sciences value a positive work and learning environment as we likewise embrace cultural and intellectual diversity and practice innovative teaching and mentorship. We value a foundational education that leads to a life that is enriched by continuous learning. We value scholarly research and creative expression. We value being engaged with the Chattanooga community, as well as our regional and global partners and our ever-expanding intellectual communities. As such, our values are summed up in four words: collaboration, inclusion, creativity, and innovation.	Faculty, staff, and students in Biology, Geology, and Environmental Science value: • Broad scientific education that promotes an appreciation and deep understanding • of the natural world • Freedom of scientific thought • The scientific process and effective dissemination of knowledge • Integrity and collegiality • Cultural diversity and inclusivity of people, thoughts, experiences and talent • Community and global engagement

1.5 Overall assessment of strengths and weaknesses related to learning outcomes, assessment, major field exams, surveys, and graduate placement

1.5.1 Biology and Environmental Science Student Learning Outcomes

Over the review period, we have formally assessed all of the biology learning outcomes at least once and five of the seven SLOs multiple times. In Environmental Science, we have assessed all the SLOs at least once and four of the eight SLOs two or more times. Due to the volume of SLOs for both programs, we have not adequately been able to track changes over the review period due to the lack of multiple assessments. In both Biology and Environmental Science, new student learning outcomes were approved by the department in 2023. These changes reflected efforts to simplify the process and improve the quality of assessment. Starting in Fall 2023, these new learning outcomes will be used to assess the program. Our goal is to assess all student learning outcomes within a three-year window.

Program Strengths: Assessment data indicate that our students meet expectations for most SLOs. Faculty have responded to low SLO assessment scores by revisiting the material and reassessing. In Spring 2023, the BGE assessment committee revised the SLOs in a way that made assessment manageable and useful. Overall, the revisions reflect the department's willingness to respond to limitations and SLOs that were difficult to assess.

Program Weaknesses: There is concern among the BGE faculty regarding the poor quantitative skills of students. The department has promoted various ways to increase student success including supporting a Sustainable Mocs Residential Learning Community which serves all three of our programs with one residential space and common classes. We have also developed a course 'How to Learn Biology' (BIOL 1000) for underperforming students in introductory biology. Enrollment in the course is targeted at incoming freshmen and students who retake BIOL 1110. New SLOs should help us to assess the impact of these changes.

1.5.2 Biology and Environmental Science Major Field Tests

We used to give the exam regularly and included it as part of the program assessment, but since the implementation of the 2014 learning outcomes, its value is unclear. We were asked by the state to give the MFT again in 2020-2021 (Biology) and 2023-2024 (Environmental Science).

Program Strengths: Although student scores were slightly below the national average for the Biology major field test, the difference was negligible. We have written a major field test for ESC, because one did not previously exist. Pilot data is available, and we will be able to compare new data in 2023-2024.

Program Weaknesses: We remain unconvinced whether the major field tests provide data that are useful for the assessment of the Biology Program. While the data show that our biology students scored slightly below the national average, it is hard to know if this decline represents a knowledge deficiency. We also have no national data from the new Environmental Science MFT, because it was written by our own faculty. Another issue is that our graduating seniors in both disciplines take the exam and know that it is of no consequence to their graduation or acceptance into graduate/professional programs. Some students make a serious effort while taking the MFT, but others simply provide random answers on the multiple-choice questions. In other words, we feel that we cannot make any serious inference for the status of our Biology and Environmental Science Programs (in comparison with other schools or previous years) by examining the results of the MFT.

1.5.3 Geology Student Learning Outcomes

The Geology program has a long history of enduring outcomes. As part of a significant revamp of the Geology curriculum, new learning outcomes were generated. Previously, nine student learning outcomes were assessed for the program. SLO 8 (Design and Conduct Geologic Research) and SLO 9 (Communicate geotechnical information) have been assessed each year allowing for comparable assessment data, which is a fundamental strength.

Program Strengths: A strength that is unique to the most recent assessment cycles relates to the enrollment in GEOL 4800 (fall cohort) and GEOL 4900 (spring cohort). These courses are used to assess competency of learning outcomes. Fall 2021 cohort had nine students and Fall 22 cohort had 10 students. Spring 22 cohort had eight students and Spring 23 cohort had nine students. Because SLO 8 and SLO 9 are assessed in both of these courses, we can track how changes impacted learning. A strength identified in the assessment shows that students were able to identify a suitable problem to be solved and the majority of students exceed the criteria for assessment.

Program Weaknesses: Assessment results for a small program, such as Geology, are particularly sensitive to outlying individuals and are difficult to interpret. This is a fundamental and unavoidable weakness of outcomes assessment based on relatively few students. Understanding this, faculty of the program are conservative in their responses to assessment results. The record enrollment in GEOL 4900, described above as a strength of the most recent two assessment cycles, was instrumental in identifying a potential weakness of the program. A weakness observed through the data is a lower percentage of students able to express their conclusions consistent with their data. We have administered the Geology ACAT since 1998 as it was used in learning outcome assessment. It was transitioned to the MFT in 2012 and has served in that role for the last 11 years.

1.5.4 Geology Major Field Test

The Geology program utilizes the ACAT exam as a long-running assessment of student learning, specific to geology concepts.

Program Strengths: We have over 20 years of data for a test used to assess student learning. Students are given a pre-test in their Mineralogy course and an outcomes test in their senior year. This long-term assessment gives us an opportunity to look at trends and make changes to the curriculum based on the results.

Program Weaknesses: We do not track pre-test data directly to outcomes, meaning there is not a direct correlation made for each student in a cohort. A better accounting of data would help strengthen its use. In years when we don't teach the courses in which it is assessed, the test has not been given. We need a consistent method of administering this test.

Similarly to Biology and Environmental Science, we recognize a potential weakness in its use of the ACAT as a major field test (MFT). Considering that results of this test have no impact on students' records of academic achievement or their future success in their professions, they have little incentive to perform well, other than their loyalty to the program. Results of the Spring 2022 ACAT outcomes (senior) test, for example, include those of one individual whose overall score corresponds to the 24th percentile. Potential carelessness of test takers could explain such low scores among others that are much higher.

1.5.5. Surveys and Graduate Placement

National Survey of Student Engagement (NSSE) results (Section 1.5) and student response to an informal survey sent to alumni by the BGE Department Head were used to assess student satisfaction with our program.

Program Strengths: NSSE results indicate student satisfaction with the program. In addition, most of the student comments on the informal survey were positive. Students acknowledged strengths including opportunities for research, faculty support, and preparation for career. In the NSSE survey, the percentage of most positive responses for Geology was above that for the College and University. Students are consistently attending professional and graduate programs.

Program Weaknesses: The main student concerns included lack of support during COVID and lack of diversity among graduate faculty. This data is difficult to collect because we do not have a dedicated faculty member for this task. Self-reporting surveys can also be biased. For example, students who left UTC unsatisfied may not be inclined to respond to requests to complete informal surveys. In the NSSE survey, the percentage of most positive answers for Biology and Environmental Science was below that for the College and University. We lack quantitative data on student progression to graduate and professional programs. The data are highly variable and do not indicate improvement over a five-year period. However, we rely mostly on self-reporting or information from a small number of faculty. Most faculty do not have time to compile the kind of dataset we need to understand how our program impacts student placement after graduation.

1.5.6 Synopsis

Formal data from SLOs and survey responses suggest our department is adequately preparing students for professions in BGE. Recent MFT suggests our BIOL students perform slightly below the national average and our GEOL students perform slightly above the national average. Data do not yet exist for the ESC MFT. Understanding this trend is difficult because student performance on exams may be biased by factors such as lack of motivation to complete the exam. Surveys suggest that students are somewhat to highly satisfied with the BGE programs. Student placement data are very limited and suggest a relatively small percentage of graduates enter graduate or professional schools. However, we view these data with skepticism. We lack the resources necessary to sufficiently collect data on student enrollments in these professional or graduate programs. This task is too difficult given our other job responsibilities.

2 Undergraduate Curriculum

The Department of Biology, Geology, and Environmental Science offers three degree programs: BS Biology, BS Geology, and BS Environmental Science. All three degrees have multiple concentrations that allow students to focus on a particular sub-discipline. In addition, the Department also offers minors in Biology, Geology, Environmental Science, and Geographic Information Science.

2.1 Curriculum Review and Improvement

2.1.1 Review of Degree Programs Across BGE Majors

2.1.1.1 *Biology*

The Department of Biology, Geology, and Environmental Science offers three degree concentrations under the Biology major: General, Preprofessional, and STEM Education, as well as a minor in Biology. The 2023-2024 UTC catalog describing courses of study in the Biology major and minor programs and a list of undergraduate courses is available online:

- [Biology: General Biology, BS](#)
- [Biology: Preprofessional, BS](#)
- [Biology: STEM Education, BS](#)
- [Biology Minor](#)

2.1.1.2 *Environmental Science*

The Department of Biology, Geology, and Environmental Science offers six degree concentrations under the Environmental Science major, as well as minors in Environmental Science and Geographic Information Science. The 2023-2024 UTC catalog describing courses of study in the Environmental Science major and minor programs and a list of undergraduate courses is available online.

- [Environmental Science: Biodiversity, Conservation and Natural Resources, BS](#)
- [Environmental Science: Earth, Atmosphere, and Geological Resources, BS](#)
- [Environmental Science: Environmental Health, BS](#)
- [Environmental Science: Environmental Policy and Planning, BS](#)
- [Environmental Science: Geographic and Cartographic Sciences, BS](#)
- [Environmental Science: Natural Resource Administration and Enforcement, BS](#)
- [Environmental Science Minor](#)
- [Geographic Information Science Minor](#)

2.1.1.3 *Geology*

The Department of Biology, Geology, and Environmental Science offers six concentrations under the Geology major: Environmental Geology, Geoarchaeology, Geology, Geospatial Science, Hydrogeology, and STEM Education, as well as a minor in Geology. The 2023-2024 UTC catalog describing courses of study in the Geology major and minor programs and a list of undergraduate courses is available online.

- [Geology: Environmental Geology, BS](#)
- [Geology: Geoarchaeology, BS](#)
- [Geology: Geology, BS](#)
- [Geology: Geospatial Science, BS](#)
- [Geology: Hydrogeology, BS](#)
- [Geology: STEM Education, BS](#)

- [Geology Minor](#)

The complete list of all course offerings can be found by clicking on ‘Display courses for this department’ under the Biology, Geology, and Environmental Science section in the [2023-2024 Undergraduate Catalog](#).

2.1.2 University Requirements

The university degree requirements are detailed in the [2023-2024 catalog](#). The major highlights include a 2.0 GPA, 120 hours, 45 hours at a four-year institution, and the last 24 hours at UTC. Included in these requirements are the General Education courses, which were most recently reviewed and updated in 2023 (GE23).

- Writing and Communication (6 hours)
- Humanities and Fine Arts (12 hours)
- Natural Sciences (7-8 hours)
- Behavioral and Social Sciences (6 hours)
- Quantitative Reasoning (6 hours)
- Individual and Global Citizenship (3 hours)

To learn more specifics about GE23, visit the [2023-2024 catalog](#) pages that address it.

2.1.3 Departmental Requirements Across BGE Degree Programs

2.1.3.1 Biology Major Requirements

During the review period, the Biology degree requirements remained mostly unchanged. New courses were created, and a few small improvements were made to existing courses, but the structure of the degree remained the same. Table 2.1 shows the main Biology structure for each concentration. It should be noted that during Fall 2023, the Department approved drastic changes to the upper-level requirements for all three concentrations within Biology. These changes, described in section 2.1.6, will take effect in the 2024-2025 catalog and should help improve our retention and graduation rates.

Table 2.1 BS Biology Degree Structure by Concentration

Category	General	Preprofessional	STEM
Introductory Biology (BIOL 1110, 1120, 1130)	3	3	3
Core (Ecology – BIOL 3060, Genetics – BIOL 3250, Evolution – BIOL 3350)	3	3	3
Ecology Lab (BIOL 3070) and Genetics Lab (BIOL 3260)	Electives	Electives	Required
Survey	2	1	2 (one Botany and one Zoology)
Advanced Ecology and Evolution	1	1	1
Cell and Physiology	1	2	1

For the General Biology concentration, majors are required to take 40 hours of Biology courses, including three Introductory Biology courses, three Core courses, two Survey courses, one Cell and Physiology course, and one Advanced Ecology and Evolution course. Beyond this, students may self-select other courses from these categories to fulfill the 40-hour requirement.

Additionally, Biology majors must complete a minimum of four Biology courses above the 4000-level and earn a minimum grade of a “C” in the core courses. No more than two hours of Seminar or four hours

of Independent Study may be counted toward the 40-hour requirement for the major. Program requirements from departments outside of ours include Scientific Writing or Departmental Thesis, one year of a foreign language, math through Calculus, Introductory Statistics, General Chemistry (I and II), Organic Chemistry (I and II), and two semesters of Physics or Geology.

For the Preprofessional Concentration, majors are required to take one Survey Course and two Cell and Physiology courses. They must take General Chemistry (I and II), Organic Chemistry (I and II), Biochemistry, and a Physics sequence (i.e., they cannot substitute the Geology sequence for Physics).

For the STEM Concentration, majors must take Genetics and Ecology laboratories (the previous two concentrations treat the labs for these courses as electives). Within the Survey category, they must take two courses, specifically a Botany course and a Zoology course. Within the Cell and Physiology category, the one required course is BIOL 4220 (Principles of Microbiology). They are also required to take one Advanced Ecology and Evolution course. For the education portion of the degree, students must take the STEM sequence:

- STEM 1030 (Step One/Step Two: Inquiry-Based Mathematics and Science Teaching)
- STEM 2010 (Knowing and Learning)
- STEM 2020 (Classroom Interactions)
- STEM 3010 (Perspectives on Science and Mathematics)
- STEM 3020 (Research Methods in Science)
- STEM 4010 (Project Based Instruction)
- STEM 4020r (Apprentice Teaching)
- EDUC 4170 (Technology and Learning)

For admission to the Teacher Education Program (TEP), students must earn a minimum 2.75 cumulative grade point average, a 2.75 GPA average on all courses taken at UTC, a 2.75 GPA in education courses with no grade lower than C, and a 2.75 GPA in content area courses with no grade lower than C. For licensure, in addition to the Department and University requirements, students must earn a minimum 2.75 cumulative GPA, a 2.75 GPA on all courses taken at UTC, a 2.75 GPA in STEM courses with no grade lower than C, and a 2.75 GPA in licensure content area courses with no grade lower than C.

2.1.3.2 Biology Minor Requirements

For a Biology minor, a student must complete 20 hours of Biology classes, including the three-course Introductory Biology sequence and at least nine hours at the 3000 level or above. Further, they must maintain a 2.0 GPA in the minor. The Biology minor is described in the 2023-2024 catalog, https://catalog.utc.edu/preview_program.php?catoid=45&poid=8288&returnto=1794.

2.1.3.3 Environmental Science Major Requirements

All Environmental Science majors are required to complete the core curriculum, consisting of required courses, a senior experience, and courses in each specific concentration of study (Biodiversity, Conservation and Natural Resources; Earth, Atmosphere, and Geological Resources; Environmental Health; Environmental Policy and Planning; Geographic and Cartographic Sciences; and Natural Resource Administration and Enforcement).

Programs facilitate exploration of subdisciplines within Environmental Science. They reflect the interdisciplinary nature of Environmental Science and allow majors to choose an area of study of particular interest. The program requirements consist of:

- ENGL 2820 (Scientific Writing) or ESC 4995r (Departmental Thesis)
- MATH 1130 (College Algebra) and MATH 1830 (Calculus for Management, Life, and Social Sciences) or MATH 1710 (Precalculus I), MATH 1720 (Precalculus II), and MATH 1950 (Calculus with Analytical Geometry I)

- MATH 2100 (Introductory Statistics)

In addition, students are required to take 34 to 35 hours of core courses including:

- ESC 1500/1510 (Introduction to Environmental Science I and II)
- BIOL 1110 (Principles of Biology I)
- BIOL 1120 (Principles of Biology II)
- GEOL 2100 (Introductory Geographic Information Systems and Remote Sensing)
- BIOL 3060 (Ecology)
- BIOL 3070 (Ecology Laboratory)
- ESC 4100 (Environmental Law)
- ESC 4840 (Values and the Environment)

Furthermore, students may select one of the three methods courses:

- ESC 3400 (Environmental Survey Methods, ESC 3600 (Air and Water Pollution Control), or ESC 4520 (Limnology and Reservoir Ecology)

Besides the common core of courses there are a myriad of courses offered in the Department to fulfill specific needs for each of the six existing Environmental Science Concentrations. Please review each concentration in the catalog to get a full list of requirements.

- [Environmental Science: Biodiversity, Conservation and Natural Resources, BS](#)
- [Environmental Science: Earth, Atmosphere, and Geological Resources, BS](#)
- [Environmental Science: Environmental Health, BS](#)
- [Environmental Science: Environmental Policy and Planning, BS](#)
- [Environmental Science: Geographic and Cartographic Sciences, BS](#)
- [Environmental Science: Natural Resource Administration and Enforcement, BS](#)
- [Environmental Science Minor](#)
- [Geographic Information Science Minor](#)

Finally, all Environmental Science majors complete a required Senior Experience (2-credit minimum) that can be met by taking any combination of the following courses that meet the two-credit minimum:

- ESC 4800 - Seminar on the Environment
- ESC 4910r - Environmental Science Internship (Specific Agency, etc.)
- ESC 4920 - Advanced Applications of Remote Sensing and Geographic Information Systems (Required for students in the Geographic/Cartographic Sciences program)
- ESC 4960r - Environmental Field Camp
- ESC 4995r - Departmental Thesis
- ESC 4997r - Research
- ESC 4998r - Individual Studies
- BIOL 4995r - Departmental Thesis
- BIOL 4997r - Research
- BIOL 4998r - Individual Studies
- GEOL 4995r - Departmental Thesis
- GEOL 4997r - Research
- GEOL 4998r - Individual Studies

2.1.3.4 *Environmental Science Minor Requirements*

The Department offers two minors within the Environmental Science Program: Environmental Science Minor and Geographic Information Science Minor.

For the Environmental Science minor, a student must complete 20 hours of Environmental Science and maintain a minimum 2.0 GPA. The coursework includes ESC 1500 and ESC 1510. The remaining 12 hours must be filled with Environmental Science courses at the 3000-level or above (Biology 3060 Ecology can also be used in the Environmental Science Minor, given that Ecology has such a close relationship with Environmental Science). The ESC minor is described in the [2023-2024 catalog](#).

For the Geographic Information Science Minor, students must complete 19 hours and maintain a minimum 2.0 GPA. The coursework includes:

- CPSC 1100 (Fundamentals of Computer Science)
- GEOL 2200 (Introductory Geographic Information Systems and Remote Sensing)
- MATH 1830 (Calculus for Management, Life, and Social Sciences), or MATH 1730 (Combined Precalculus)

Students need to take eight hours of advanced GIS and Remote Sensing courses, selecting from one of the two options:

- Advanced GIS/Remote Sensing Courses Option 1
 - o ESC 4650 (Remote Sensing and Imagery Analysis) or GEOG 4650 (Remote Sensing and Imagery Analysis)
 - o ESC 4660 (Geographic Information Systems) or GEOG 4660 (Geographic Information Systems)
 - o ESC 4920 (Advanced Applications of Remote Sensing and Geographic Information Systems)
- Advanced GIS/Remote Sensing Courses Option 2
 - o GEOL 4530 (Geographic Information Systems for Geoscientists) and
 - o GEOL 4550 (Remote Sensing for Geoscientists)

The GIS minor is described in the [2023-2024 catalog](#).

2.1.3.5 *Geology Major Requirements*

Students majoring in all Geology concentrations, with the exception of Geology: STEM education, are required to complete the following to graduate:

- The first course in sequence (CHEM 1110/L, PHYS 1030/L or PHYS 2300/L, and BIOL 1110 or ESC 1500).
- One course as a second sequence from CHEM 1120/L, PHYS 1040/L or PHYS 2310/L and BIOL 1120 or ESC 1510.
- MATH 1730 (Combined Precalculus) or MATH 1950 (Calculus with Analytic Geometry)
- ENGL 2810 (Technical Writing) or ENGL 2820 (Scientific Writing)

Additionally, they must take 32 hours of Geology courses that include four credits of introductory classes, choosing from:

- GEOL 1025 (Geology of the National Parks) with GEOL 1110L (Physical Geology Lab)
- GEOL 1030 (Natural Hazards) with GEOL 1110L (Physical Geology Lab)

- GEOL 1110 (Physical Geology) with GEOL 1110L (Physical Geology Lab)
- GEOL 1040 (Earth's Resources and the Environment) with GEOL 1105L (Earth and the Environment Lab)
- GEOL 2200 (Global Climate Change: Past, Present, and Future) with GEOL 1105L (Earth and the Environment Lab)
- GEOL 2250 (Oceanography) with GEOL 1105L (Earth and the Environment Lab)

and

- GEOL 1120 (Historical Geology) and GEOL 1120L (Historical Geology Lab)

As part of the core Geology curriculum, all students are also required to take the following courses for 24 credits:

- GEOL 2100 (Introductory Geographic Information Systems and Remote Sensing with Lab)
- GEOL 3410 (Mineralogy and Lab)
- GEOL 3540 (Sedimentology and Stratigraphy)
- GEOL 4080 (Earth Surface Processes)
- GEOL 4510 (Structural Geology)

and

- GEOL 4800 (Research Design)
- GEOL 4900 (Senior Research Project) Or GEOL 4995r (Department Thesis)

Besides the common core of courses there are a myriad of courses offered in the Department to fulfill specific needs for each of the five Geology Concentrations (except STEM). Please review each concentration in the catalog to get a full list of requirements.

- [Geology: Environmental Geology, BS](#)
- [Geology: Geoarchaeology, BS](#)
- [Geology: Geology, BS](#)
- [Geology: Geospatial Science, BS](#)
- [Geology: Hydrogeology, BS](#)

The Geology: STEM Education Concentration aligns with the requirements for the STEM degrees on campus. For admission to the Teacher Education Program (TEP) they must earn a minimum 2.75 cumulative GPA, a 2.75 average on all courses taken at UTC, a 2.75 in education courses with no grade lower than a C, and a 2.75 in content area courses with no grade lower than C. In addition to the department and university requirements, there are the following minimum requirements for graduation with licensure: 2.75 cumulative average, 2.75 at UTC, 2.75 average in STEM courses with no grade lower than C, 2.75 average in courses in licensure content area course with no grade lower than C.

Geology: STEM Education students must also take 36 hours of Geology courses that include four credits of introductory classes, choosing from:

- GEOL 1025 (Geology of the National Parks) with GEOL 1110L (Physical Geology Lab)
- GEOL 1030 (Natural Hazards) with GEOL 1110L (Physical Geology Lab)
- GEOL 1110 (Physical Geology) with GEOL 1110L (Physical Geology Lab)
- GEOL 1040 (Earth's Resources and the Environment) with GEOL 1105L (Earth and the Environment Lab)

and

- GEOL 1120 (Historical Geology) with GEOL 1120L (Historical Geology Lab)

As part of the core Geology curriculum, all students are also required to take the following courses for 24 credits:

- GEOL 2100 (Introductory Geographic Information Systems and Remote Sensing with Lab)
- GEOL 3410 (Mineralogy and Lab)
- GEOL 3540 (Sedimentology and Stratigraphy)
- GEOL 4080 (Earth Surface Processes)
- GEOL 4510 (Structural Geology)

and

- GEOL 4800 (Research Design)
- GEOL 4900 (Senior Research Project)
- Or
- GEOL 4995r (Department Thesis)

Additional requirements include:

- GEOL 2200 (Global Climate Change: Past, Present, and Future)
- GEOL 2250 (Oceanography)
- GEOL 3070 (Geology of Tennessee)
- CHEM 1110/L (General Chemistry I and Lab)
- CHEM 1120/L (General Chemistry II and Lab)
- BIOL 1110 and BIOL 1120 (Principles of Biology I and II) or PHYS 1030/L (General Physics-Mechanics and Heat and lab) and PHYS 1040/L (General Physics-Electromagnetism and Optics) or (PHYS 2300/L Principles of Physics-Mechanics and Heat and Lab) and PHYS 2310/L (Principles of Physics-Electricity and Magnetism and Lab)
- ASTR 1010/L (Introduction to Astronomy-The Solar System and Lab)
- MATH 1730 (Combined Precalculus) or MATH 1950 (Calculus with Analytic Geometry I with Lab)
- MATH 2100 (Introductory Statistics)

As part of their STEM requirements, students must complete:

- STEM 1030 (Step One/Step Two: Inquiry-Based Mathematics and Science Teaching)
- STEM 2010 (Knowing and Learning)
- STEM 2020 (Classroom Interactions)
- STEM 3010 (Perspectives on Science and Mathematics)
- STEM 3020 (Research Methods in Science)
- STEM 4010 (Project Based Instruction)
- STEM 4020r (Apprentice Teaching)
- EDUC 4170 (Technology and Learning)
- EDUC 4420 (Professional Seminar)

2.1.3.6 Geology Minor Requirements

For a Geology minor, a student must take a total of 18 hours of Geology classes. They choose one introductory course with a lab and GEOL 1120 (Historical Geology) and GEOL 1120L (Historical Geology Laboratory), plus 10 additional hours of Geology courses at the 3000-4000 level.

2.1.4 General Education Courses Across BGE Programs

All UTC students are required to take 7-8 hours of courses in the Natural Sciences. The purpose of this category is to allow students to participate in the systematic ways in which human beings analyze the physical universe, to appreciate the achievements of the human mind in comprehending the universe, and

to understand the significant role of the natural sciences in human development. The Natural Science Student Learning Outcomes are described in the catalog as lecture and lab courses:

Lecture/Non-lab courses:

1. Students will explain how scientific knowledge develops over time as new evidence emerges.
2. Students will demonstrate scientific literacy by locating, evaluating, interpreting, and applying scientific information/data.
3. Students will explain how scientific developments impact society.

Corequisite lab courses:

1. Students will demonstrate the connection between scientific theory and application.
2. Students will apply the methods of science by testing hypotheses and reporting the results.

BGE has numerous courses approved for the GE23 curriculum. These are listed in the [2023-2024 catalog](#).

General education courses are reviewed year over a 5-cycle for recertification. These procedures and the recertification schedule can be found [here](#). Because UTC adopted new General Education requirements in 2023, all the courses were certified in the newest General Education, GE23.

2.1.4.1 Biology General Education Courses

Biology offers the following General Education courses in the Natural Sciences:

- BIOL 1050 and 1050L (Life on Earth Lecture and Lab)
- BIOL 1100/ESC 1100* (Conservation of Biodiversity)
- BIOL 1110 and 1110L (Principles of Biology I Lecture and Lab)
- BIOL 1120 and 1120L (Principles of Biology II Lecture and Lab)
- BIOL 2100 and 2100L (Microbiology and Health Lecture and Lab)

All BIOL courses (except for BIOL 1120) were recertified with the GE14 recertification in 2022-2023. BIOL 1120 is undergoing GE14 recertification in this academic year, 2023-2024.

2.1.4.2 Environmental Science General Education Courses

The departmental Environmental Science Program offers the following General Education courses in the Natural Sciences:

- ESC 1100/BIOL 1100 (Conservation of Biodiversity)
- ESC 1500 and 1500L (Introduction to Environmental Science I Lecture and Lab)
- ESC 1510 and 1510L (Introduction to Environmental Science II Lecture and Lab)

All the ESC courses were recertified with the GE14 recertification in 2022-2023.

2.1.4.3 Geology General Education Courses

The Geology Program offers the following General Education (Gen Ed) courses in the Natural Sciences category. The program has made significant changes to the alignment of their curriculum so that all of the Geology general education courses offered can fulfill the requirements of the Geology degrees. This change was made to focus on recruiting in the general education courses. Students can now take any of

the following courses to earn Gen Ed lecture credit and when paired with a lab, will receive general education Natural Science with a lab credit:

- GEOL 1025 (Geology of the National Parks) paired with GEOL 1110L (Physical Geology Laboratory)
- GEOL 1030 (Natural Hazards) paired with GEOL 1110L (Physical Geology Laboratory)
- GEOL 1110 (Physical Geology) paired with GEOL 1110L (Physical Geology Laboratory)
- GEOL 1040 (Earth's Resources and the Environment) paired with GEOL 1105L (Earth and Environment Lab)
- GEOL 2200 (Global Climate Change: Past, Present, and Future) paired with GEOL 1105L (Earth and Environment Lab)
- GEOL 2250 (Oceanography) paired with GEOL 1105L (Earth and Environment Lab)
- GEOL 1120 and 1120L (Historical Geology Lecture and Lab)

All above GEOL courses were recertified with the GE14 recertification in 2022-2023, except GEOL 1025 and GEOL 2250, which are undergoing GE14 recertification in this academic year, 2023-2024.

2.1.5 Service Courses Across BGE Programs

2.1.5.1 *Biology Service Courses*

Biology offers the following service courses:

- BIOL 2060 (Functional Human Anatomy)
- BIOL 2080 (Human Physiology)
- BIOL 2100 (Microbiology and Health)

Since these courses are required prerequisites for Nursing, Physical Therapy, and UTC Natural Sciences Secondary Education majors, the content of the courses gives students skills and depth of knowledge to ensure success in these majors. Frequent dialog between BGE faculty who teach these service courses and faculty of UTC's Nursing, Physical Therapy, and Secondary Education Programs ensures that these service courses fulfill educational expectations.

2.1.5.2 *Environmental Science Service Courses*

The Environmental Science Major offers the following service courses:

- ESC 1100 (Conservation of Biodiversity)
- ESC 1500 (Introduction to Environmental Science I)
- ESC 1510 (Introduction to Environmental Science II)

These courses benefit Health and Human Performance: Sport, Outdoor Recreation, and Tourism Management, Engineering, and the Middle Grades Education: Mathematics programs.

In addition, the following service courses specifically benefit the Civil Engineering Program with an Environmental Concentration:

- ESC 3400 (Environmental Survey Methods)
- ESC 3600 (Air and Water Pollution Control)
- ESC 4520 (Limnology and Reservoir Ecology)
- ESC 4100 (Environmental Law and Agencies)

- ESC 4840 (Values and the Environment)

The content of the courses gives students skills and depth of knowledge to ensure success in their majors. To assure effectiveness of the service courses to the overall education of different majors that benefit from them, faculty from all the departments involved maintain frequent dialog and coordination of the courses with BGE faculty.

2.1.5.3 Geology Service Courses

Geology offers the following service courses beyond General Education:

- GEOL 1110/1110L (Physical Geology Lecture and Lab) are required or are an option for 10 other majors at UTC.
- GEOL 1120/1120L (Historical Geology Lecture and Lab) are required or are an option for three other majors.

Geology courses also serve as requirements for a few Environmental Science concentrations. The program offers Hydrogeology, Earth Surface Processes, Applied Environmental Geochemistry, Hydrologic Modeling, GIS for Geoscientists, and Remote Sensing for Geoscientists at both graduate and undergraduate levels.

2.1.6 Curriculum Improvement and Review

Content and organization of the Department's curriculum is reviewed regularly. Faculty members wishing to propose a curriculum change must submit a curriculum proposal as either an information item (editorial change in course catalog) or a full proposal (new course proposal, change to core courses, etc.). The Department Curriculum and Planning Committee reviews and votes on proposed changes in the curriculum. If the Department committee votes in favor of a proposal, the proposal moves on for approval by the Department faculty. If approved by the Department faculty, the proposal is then sent to the College Curriculum Committee, College Dean, Records Office, Provost, and the University Curriculum Committee for final approval.

2.1.6.1 Biology Curriculum Improvement

In Fall 2023, the department voted to overhaul the Biology curriculum to increase student retention, ease the scheduling of classes, and allow more flexibility on upper-level Biology classes. Prior to that, the last major Biology curriculum changes were made in 2013. Below, we provide details for each concentration update.

General Biology Concentration: Until this year, students were required to take the Introductory Biology sequence (three classes), the core sequence (Ecology, Evolution, and Genetics), one Cell/Physiology class, two Survey classes, and one Advanced Ecology and Evolution class. Following the 2023-2024 program revisions, students may take any 2000/3000/4000 class (16 hrs. required at the 4000 level) to fulfill 20 hrs. in Biology after they finish the intro and core sequence. These changes (if approved at the university level) were necessary because Survey classes were creating a bottleneck and students had a hard time graduating on time. Additionally, these new changes will allow students more flexibility in the 4000-level classes they want to take and could potentially allow them to specialize in the specific areas they are interested in.

Preprofessional Concentration: Like the General Biology Concentration, Preprofessional students are required to take the Introductory Biology sequence (three classes), the core sequence (Ecology, Evolution, and Genetics), and one Advanced Ecology and Evolution class but must also take two Cell/Physiology classes and one Survey class. Following the 2023-2024 program revisions, students are still required to take two Cell/Physiology classes but may take any 2000/3000/4000 class (16 hrs. required at the 4000 level) for the remaining 20 hrs. in Biology.

Our department hopes that these changes will help us retain more Preprofessional students. We have seen a general decline in these majors, which does not align with the number of students seeking professional school admittance.

STEM Concentration: This concentration is a joint effort between BGE and the School of Education. Several updates were advised by Education to align with program requirements and student teaching in the last semester. From the Biology side of the curriculum, we streamlined the upper-level Biology requirements similarly to the General Biology Concentration, discontinued requirement of the Ecology and Genetics labs, and reduced the overall hours of the degree to 124.

Along with the development and implementation of the new Biology curriculum, several new courses were added since the last review to facilitate student progression to graduation: Ant Ecology, Cancer Biology, Deja Flu: Epidemiological Impacts of Emerging and Reemerging Infectious Diseases, Ecology of Rarity, Pollinator Biology, Field Botany, History of Evolutionary Thought, and Meiofauna Biodiversity. Several were developed by new hires who had specific expertise.

2.1.6.2 Environmental Science Curriculum Improvement

During the review period, the Environmental Science curriculum was revised to remove roadblocks, eliminate outdated programs, add new programs, and strengthen the required and elective offerings within several programs. Specifically, the Engineering Science Concentration was deactivated due to the Engineering Program retiring many of the courses required for the completion of the degree. Environmental Health (formerly the Chemistry Concentration), Environmental Policy and Planning (formerly the Sociology/Anthropology Concentration), and Natural Resources Administration and Enforcement (new) are concentrations that did not exist in their current forms, if at all, before our last major curriculum change. The Biodiversity, Conservation, and Natural Resources Concentration and the Earth, Atmosphere, and Geological Resources Concentration replaced the Biology and Geology concentrations, respectively. In addition to changes in the Environmental Science majors, the list and classification of courses students must take to fulfill the requirements of each were classified into categories. Students are now required to have a specific number of courses credits per category of courses. Such an organization is intended to ease the selection of courses.

Another very important change made during the last review period is the addition of a spatial science component to the Environmental Science core curriculum. Geospatial science is a key tool associated with environmental science. GEOL 2200 (Introduction to Geographic Information Systems and Remote Sensing) replaced Geography 2210 (Maps and Mapping) in the core, and it gives students a solid foundation with spatial tools and computer-based technologies that are used to study the environment.

2.1.6.3 Geology Curriculum Improvement

Review of the Geology curriculum occurs several times each semester through formal and informal discussion between Geology faculty regarding program Student Learning Outcomes and reflection on the results of that assessment. Other changes to the curriculum stem from conversations with students and recent alumni of the program and from the last program review.

The Geology curriculum underwent a significant revision resulting in changes reflected in the 2023-2024 Undergraduate Catalog with goals to

1. increase the number of majors in the program,
2. update the curriculum according to changes in the field, and
3. incorporate the expertise of new faculty in the curriculum.

On February 1-2, 2020, Geology faculty began the curriculum revision process by participating in a travelling workshop titled “Building Stronger Geoscience and Environmental Science Departments and

Programs” led by two facilitators from the National Association of Geoscience Teachers (NAGT). However, after a productive workshop weekend, the COVID pandemic brought curriculum revision activities to a halt. Supported by a College of Arts and Sciences Summer Collaborative Project Grant in Summer 2022, Geology faculty restarted curriculum revision efforts. During that time, faculty reviewed the 2021 publication of the [Vision and Change in the Geosciences: The Future of Undergraduate Geoscience Education](#). From this, the Geology curriculum redesign was based on new program learning outcomes. A summary of key curriculum changes is listed below. Nearly 40 curriculum proposals were submitted, and changes were implemented in the 2023-2024 catalog.

Summary of key Geology Curriculum Changes to the BS Geology degree:

- (1) Opened all introductory courses to count towards first course in the major. Previously, only Physical Geology and Lab counted as the gateway course into the major. Any students who took other introductory-level general education natural science courses in geology, and wanted to change their major, would have to go back and re-take the Physical Geology course. We opened the existing courses (Geology of the National Parks, Oceanography, and Global Climate Change: Past, Present and Future) and created new courses (Natural Hazards, Earth Resources and the Environment, and Earth and Environment Lab), all of which count towards the major. To ensure key, core information is learned in these courses that will allow the students to succeed as they progress through the major, the following content is covered in all courses: early Earth and Earth systems, plate tectonics, Earth layers and structure, rocks and the rock cycle, academic understanding of minerals (definition and general classification), basic understanding of geologic time, introduction of geologic time scale and general relative age principles.
- (2) Removed the prerequisite of Physical Geology for Historical Geology.
- (3) Modified the math requirements to include a choice of either MATH 1730 (Combined Precalculus) or MATH 1950 (Calculus with Analytical Geometry). We noted in the catalog that students should consult their Geology advisor to determine which math course “best suits their post-graduation plans.”
- (4) Modified the science requirements to include the first course in General Chemistry and General Physics (option of algebra or calculus-based) and General Biology I or Environmental Science I. In addition, students must choose one second sequence course from the three first sequence science courses chosen.
- (5) Added the option of Technical Writing in the ‘Writing in the Discipline Category’ so that students can choose between it or Scientific Writing depending on their post-graduation plans.
- (6) Created a core set of classes that is required for majors in all Geology concentrations. These include Introductory Geographic Information Systems and Remote Sensing, Mineralogy, Sedimentology and Stratigraphy, Earth Surface Processes, and Structural Geology.
- (7) Modified the concentration requirements for Geology: Geology and Geology: Environmental Geology degrees.
- (8) Created three new concentrations: Geology: Geoarchaeology (in partnership with the Anthropology Program), Geology: Hydrogeology, and Geology: Geospatial Science.
- (9) Modified Geology: STEM Education to reflect changes to the STEM Education requirements and the Geology core curriculum.

2.2 Course Scheduling and Progress Toward Degrees

2.2.1 Biology Scheduling and Progress Toward Degrees

The Department offers many courses on a regular basis (every semester, every year, or every other year), allowing students to make reasonable progress toward their degree. The number of Biology majors has decreased over the last five years (Table 2.2). However, the program still has more than 500 majors,

which continues a high demand for certain courses, particularly upper-level courses, that often fill quickly during registration. To meet the need, we now offer several summer classes, more lab sections, larger lecture enrollment, and online options. Curriculum changes implemented during the Fall 2023 cycle will provide more flexibility for Biology students. We anticipate that all students who need 4000-level Biology classes will be able to enroll. The demand for service courses has remained stable during the last five years.

Table 2.2 BS Biology Enrollment Data 2018-2023.

Concentrations/Minor	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022	Fall 2023
General	204	183	218	229	212	201
Preprofessional	508	505	416	355	308	300
STEM Education	17	11	13	11	5	8
Minor	55	83	103	110	110	87
Total	784	782	750	705	635	596

2.2.2 Environmental Science Scheduling and Progress Toward Degrees

BGE offers multiple sections of introductory level and service courses every semester, including summer semesters, thereby increasing a student's opportunity to progress through the curriculum and graduate on time. From 2018-2023, the number of students majoring in Environmental Science increased by about 17% (Table 2.3). The most recent curriculum revision eliminated a non-functional track (as previously mentioned), revised the other tracks to avoid or provide alternatives to bottleneck courses, and added a new track in Natural Resource Administration and Enforcement. The curriculum changes have streamlined progression through the degree tracks. We have also begun to offer several online core and service courses during fall, spring, and summer semesters, increasing access to both UTC and transient students.

Table 2.3 B.S. Environmental Science Enrollment Data 2018-2023

Concentrations/Minors	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022	Fall 2023
Biodiversity, Conservation and Natural Resources	125	148	156	160	188	179
Earth, Atmosphere, and Geological Resources	12	18	15	11	11	12
Environmental Health	4	15	17	11	9	9
Environmental Policy and Planning	28	33	37	34	38	35
Geographic and Cartographic Sciences	6	4	3	3	5	13
Natural Resource Administration and Enforcement (new 2021)				2	12	21
ESC Minor	20	30	29	31	21	15
GIS Minor	5	5	6	6	12	17
Total	172	253	263	258	296	288

2.2.3 Geology Scheduling and Progress Towards Degree

The program offers required courses on a regular basis (every semester, every year, or every other year). A scheduling matrix ([Appendix 2-A](#)) summarizes the frequency with which required courses in the Geology curriculum are offered and when students of each graduating class should take them. During advisement, faculty advisors use the matrix to create a course plan for majors, thus helping students to enroll in required courses and make reasonable progress toward their degree. Since Fall 2016, there has been an overall relative decrease in majors (Figure 2.4 and Table 2.4); however, the average number of majors between Fall 2010 and Fall 2023 is 45, compared to 42 current majors as of Fall 2023, showing a consistent number of majors averaged over the past 13 years. The new curriculum revamp is intended to increase the number of majors, attracting not only majors from within UTC, but new first year majors and transfers from outside of UTC.

Figure 2.4 BS Geology majors Fall 2010-Fall 2023

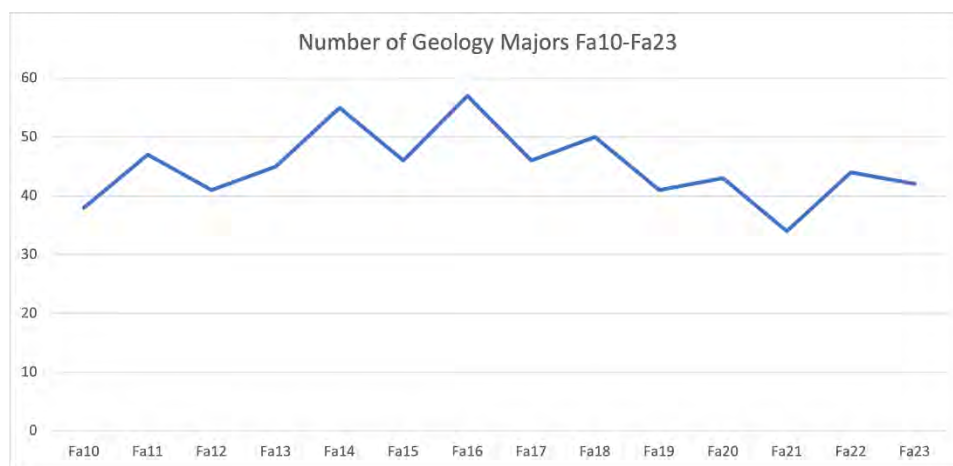


Table 2.4 BS Geology Concentration Enrollment Data 2018-2023

Concentrations/Minors	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022	Fall 2023
Geology	34	26	27	18	26	26
Environmental Geology	15	14	15	15	18	13
STEM Education	1	1	1	1	0	1
Geoarchaeology*						
Geohydrology*						1
Geospatial Science*						1
GEOL minor	7	11	6	7	6	7
Total	57	52	49	41	44	49

*New concentration beginning Fall 2023

2.3 Pedagogical and Technological Innovations to Enhance Student Learning

2.3.1 Pedagogical Innovations to Enhance Student Learning

The greatest pedagogical enhancements to BGE curriculum came in the Fall of 2023 with the changing of the Biology curriculum as described in section 2.1.6.1, and in the Geology Program curriculum revamp (2.1.6.3) that was enacted in Fall 2023. The updated curriculum will increase student retention, ease the scheduling of classes, and allow more flexibility on upper-level Biology classes. For Geology, the new curriculum will allow for a smoother transition into the major and offer new pathways of concentration.

The Environmental Science curriculum has been enhanced as well. One program was removed (Engineering Science) and another introduced (Natural Resource Administration and Enforcement). Courses were also regrouped into different categories to facilitate better selection of classes for students, especially in Environmental Policy and Planning.

Changes to pedagogy within the classroom are made by individual faculty in response to Course Learning Evaluations that are administered at the end of each semester. Faculty reflect on student feedback during their annual review and modify accordingly for the next semester. Changes in Geology courses have also been made in response to discussions around the program Student Learning Outcomes. Enhancements to the Geology curriculum came largely with the addition of new faculty, Drs. Ashley Manning-Berg, Stephanie DeVries, and Jennifer Taylor, who brought astrobiology, climate change, aqueous geochemistry, hydrologic modeling courses, and more to the program. Five Geology courses are designated “Beyond the Classroom Experiential Learning Courses.” This designation indicates that students participate in experiential learning through real-life application of course content. Several Geology faculty incorporate high impact practices such as research projects and ePortfolios into their courses.

Some pedagogical changes have occurred in courses with the incorporation of the Canvas platform that is required across the University. Several courses use Canvas to assign quizzes, discussion boards, and electronic homework to assess content knowledge in courses. Changes to Environmental Science courses have primarily been initiated by individual instructors. For example, Dr. Reynolds has altered some of the writing assignments in ESC 1100 to better reflect and satisfy the new General Education requirements. He has also added a new lab exercise in ESC 1510 along with new, more modern case studies to the lecture portion of that course. Additionally, he has been experimenting with more class discussion as opposed to traditional lectures and has opted for more Think-Pair-Share exercises (mostly revolving around the case studies). As the ESC Laboratory Coordinator, Dr. Reynolds has incorporated more videos, carefully selected to enhance student learning, into the ESC 1500 Laboratories.

Besides these fundamental changes to the Biology, Geology and Environmental Science curricula, BGE faculty have a strong record of using innovative techniques to teach in the classroom, lab, and field. For example,

- BIOL 1000 (How to Learn Biology) was developed to help improve student success in BIOL 1110. This is based on the book “Teach Yourself How to Learn” by Saundra McGuire. It is taught asynchronously online during the first part of term. It incorporates SLOs from the BIOL 1110 to teach students how to learn.
- BIOL 1050 (Life on Earth) faculty adopted the transparency in learning and teaching (TILT) framework for online class discussions.
- BIOL1110 (Principles of Biology I) faculty used a 'dynamic lecturing' approach (Lecture + Active Learning) in which students regularly participate in learning activities like self-reflection (minute papers), think-pair-share, group discussion and problem solving, polling, and physical re-enactments of biological/natural processes.
- BIOL/ESC/GEOL 1250 (First Year Experience) students completed a team building exercise in the Challenger Center.
- BIOL 3070 (Ecology Lab) students conducted a long-term study (three years) of decomposition in Warner Park bioretention gardens in collaboration with Chattanooga Parks and Outdoors or mapped invasive plant species occurrence at Reflection Riding.
- BIOL 4070 (Entomology) had weekly black light collecting events at the city cemetery across the campus.

- BIOL 4460 (Global Change Biology) students worked in small groups to prepare a learning module on an assigned topic, including a lecture, guided reading, discussion, and interaction activity.
- BIOL 4480 (Ant Ecology), BIOL 4210 (Animal Physiology) and BIOL 4020 (Meiofauna Biodiversity) students had a joint poster presentation to present their results from their individual projects during lab.
- BIOL 4540 (Plant Ecology) students worked in small groups to conduct research to investigate the ability of federally endangered plants to adapt to change.
- BIOL 4999 (Ecology of Rarity) students worked in small groups to prepare a learning module on an assigned topic, including a lecture, guided reading, discussion, and interaction activity.
- In ESC 1510 (Introduction to Environmental Science I), case studies were updated and modernized; in ESC 1500L (Environmental Science I Lab), short videos were incorporated in lab exercises to enhance learning.
- In ESC 1510L (Introduction to Environmental Science II Lab), a new field-based sampling lab was introduced on community structure.
- ESC 2500 (World Resources) students contributed their own independent research to a shared Google slides presentation in preparation for an in-class discussion on the pros and cons of topics such as "Nuclear Energy" and "Recycling".
- GEOL 1110 (Physical Geology) high impact practices (HIP) were implemented through ePortfolios, a semester-long research project, and a partial flipped-classroom style for content delivery.
- In GEOL 3070 (Geology of Tennessee), HIPs were implemented through ePortfolios.
- In GEOL 3220 (Soil Properties, Genesis and Development Across the Landscape), an Experiential Learning course, HIPs were implemented through ePortfolios, a research project, and partial flipped-classroom style for lectures.
- In GEOL 3410 (Mineralogy), an Experiential Learning course, HIPs were implemented through ePortfolios, a semester research project, and partial flipped-classroom style for lectures; additionally, students collected data remotely using an Electron Microprobe and SEM at Florida International University to examine their project samples.
- In GEOL 4080 (Earth Surface Processes), an Experiential Learning course, HIPs were implemented through ePortfolios, and partial flipped-classroom style for lectures.
- Both GEOL 4900 (Senior Research Project) and GEOL 4960 (Geology Field Experience) are Experiential Learning courses.

2.3.2 Technological Innovations to Enhance Student Learning

Perhaps the single most important technological advantage over the last five years has been the installation of new podia/computers in all lectures and labs in Holt and Grote Halls. Additionally, BGE has a new (as of 2019) computer lab that is frequently updated with software needed for various classes. Some of the labs also have microscopes that can be projected. Classroom podium/projectors are managed by campus IT. Laboratory podium/projectors (TVs) are managed by the department. If they fail, we are responsible for the cost of replacement. This has been handled through laboratory fees. The cost of these technological upgrades was split between the Department and IT. During the last few years, many microscopes were acquired to replace microscopes that had been damaged from years of heavy use, as well as to include additional microscopes with improved features. Specifically, over the last two years, the College of Arts and Sciences has supported the purchase of almost \$90K in new microscopes for the labs.

Office, teaching, and laboratory spaces in Grote Hall have computers and document projectors in all classrooms, and in most, those feed into overhead ceiling-mounted projection systems. The technology in the main teaching classrooms has all been updated in the last two years. We have a rock prep room

complete with saws of several sizes, thin-section preparation equipment, and a sonic bath. With the hire of a new faculty member, there is a recent addition of a shaker table and a Franz magnetic separator. In our geochemistry laboratory, we have two fume hoods, one of which has positive pressure. An HP Designjet Z5200 Postscript plotter is used by students in the seminar series courses and in GIS for Geologists for their final presentations. All BGE students may use the plotter for presentation of their research at professional meetings. Dr. Brock-Hon uses the Holt computer lab for Mineralogy, Earth Surface Processes, and Soils courses. Dr. Hossain uses the SIM Center computer lab and geospatial software for his GIS and Remote Sensing courses. The Geology introductory lab space contains monitors and a podium system that allows students to share group work via the Vivi system. Geology courses are also able to use new microscope cameras on three microscopes that allow students to see the projected image as a group and on the classroom screen. Fifteen new iPads/iPencils (purchased in Spring 2023) have been implemented into the Geology Program to allow for a more interactive class experience and the ability to view real-time data and imagery during class and lab time.

2.3.3 Developing Technological Skills

Across the BGE Department, a variety of opportunities are provided for students to learn and practice computer and technology skills. Curriculum content of departmental courses requires students to perform web-based research and to access designated websites to obtain course assignments, reference materials, and grades. In addition, depending on their academic concentration, students are required to integrate a variety of technologies, computer skills, and analytical software to address relevant issues and scientific queries in Biology, Environmental Science, and Geology. There are courses in all majors that are technology driven or technology dependent that require such computer and technology skills. In Biology and Environmental Science, most upper-level courses contribute to advancing the technological skills of our students. Specific examples of building technological skills in Biology and Environmental Science coursework include:

- Use of Excel to complete a variety of statistical analyses in ESC 1510 (Environmental Science II) such as descriptive statistics, scatterplots, correlation coefficients, and student t-tests
- Use of spreadsheet, graphing, and statistical analysis programs for students enrolled in BIOL 3060/3070 (Ecology), BIOL 4280 (Cell Biology), ESC 3400 (Environmental Survey Methods), ESC 4650 (Remote Sensing and Imagery Analysis), and ESC 4660 (Geographic Information Systems)
- Use of software platforms and applications in bioinformatics in the BIOL 4260 (Cell Biology) and BIOL 4200 (Molecular Genetics) laboratories to predict the 3D structure of proteins based on known gene sequences, design and execute mutagenesis strategies for protein engineering, and search a variety of cell and molecular databases
- Use of student prepared podcasts or presentations that become part of the weekly course content in BIOL 4590 (Advanced Topics in Evolutionary Ecology)

In Geology, examples of courses that contribute to students' technological skills include GEOL 3410 (Mineralogy), GEOL 4080 (Earth Surface Processes), GEOL 4530 (GIS for Geoscientists), and GEOL 4550 (Remote Sensing for Geoscientists). Specific examples of building technological skills in Geology coursework include:

- Remotely accessing a Scanning Electron Microscope to analyze project samples in Mineralogy
- Heavy use of Google Earth and data from the National Geologic Map Database as well as other online data to solve problems in Earth Surface Processes
- As of the 2023-2024 academic year, all Geology majors must take a course in GIS (Introductory GIS) as part of the requirement for the major.

2.4 Curriculum Alignment with Program and Student Learning Outcomes

Section 1. Learning Assessment details how the specific course work aligns with the student learning outcomes. A curriculum map for Biology is provided in [Appendix 1-B](#), a curriculum map for Environmental Science is provided in [Appendix 1-G](#), and a curriculum map for Geology is provided in [Appendix 1-I](#).

2.5 Curriculum Content and Current Standards, Practices, and Issues in the Discipline

The curriculum is designed to emphasize fundamental principles of Biology and Environmental Science in a variety of contexts. Faculty develop syllabi each semester that clearly outline the student learning outcomes for each course, as well as the standards and expectations for the student. Current standards and practices are rigorous and provide the opportunity for students to utilize critical thinking and the principles from their past coursework. All content within the curriculum has the goal of cultivating students who are competitive and competent so they will ultimately be successful in the career of their choice. Issues in the discipline are utilized as learning tools in the classroom and laboratory setting to enhance student comprehension and awareness. Keeping curriculum content and practices current ensures students are well-equipped for their future careers.

At all levels of the curriculum, there is a strong emphasis on hands-on, inquiry-based investigative activities in the laboratory and field setting. During UTC's last Quality Enhancement Plan, [UTC's Think Achieve program](#) was developed to promote Active Experiential Learning. There are several courses in the department that have obtained the certification for providing active experiential learning.

- BIOL 1140 (Urban Gardening)
- BIOL 4170 (Ornithology)
- BIOL 4335 (Wildlife Education and Rehabilitation)
- BIOL 4370 (Urban Gardening-Organoponics)
- BIOL/ESC 4540 (Plant Ecology)
- GEOL 3220 (Soil Properties, Genesis, and Development Across the Landscape)
- GEOL 3410 (Mineralogy)
- GEOL 4080 (Earth Surface Processes)
- GEOL 4900 (Senior Research Project)
- GEOL 4960r (Geology Field Experience)

Through curriculum proposals suggested by a sole faculty member or by the whole department, a single course or the complete program may be subjected to changes to better align with current standards and to prepare our students to compete in the professional world. Major curriculum changes in Biology occurred in fall of the 2023-2024 academic year, and in Environmental Science during the 2021-2022 academic year. Particular courses were added or modified annually to enhance our program of studies. Each faculty works to stay current and bring the highest level of knowledge to their students. There are many classes that introduce reading and discussion of current issue publications in both lectures and seminar classes. With the recent significant revamp of the Geology curriculum and changes driven by the "Vision and Change in the Geosciences: The Future of Undergraduate Geoscience Education" document, we re-evaluated the core concepts for success and core competencies in our program. From this, we made adjustments to our Program Learning Outcomes and, as a result, our core courses within the degree. One key addition to our Program Learning Outcomes is "Outcome #3: Apply knowledge of geology and systems thinking to critically assess problems that impact society." We also added GEOL 2100 (Introduction to GIS and Remote Sensing) as a required course for all students in the major because of this technology and its application to the field. We have already seen the benefit of adding this skillset to our program, with a number of recent graduates employed because of their GIS skills. While we cannot

focus on one type of employment for our Geology majors, we endeavor to include many of these skills in our curriculum. Select examples of how Geology courses help build these skills in students includes:

- Critical thinking applied through data-set analyses in Mineralogy, GIS, Remote Sensing, Structural Geology, and Paleontology.
- Field methods through field investigations are taught in many classes including Petrology, Structure, Earth Surface Processes, Soils, and culminates in Field Methods in Structural Geology.
- Written and oral communication skills are practiced in many classes including Soils, Earth Surface Processes, Dynamic Earth, Sedimentology and Stratigraphy, and culminate in our seminar research and presentations.

2.6 Analytical and Critical Thinking and Problem Solving in the Curriculum

The ability to think critically is an essential component of science. Critical thinking skills enable students to determine whether they accept, reject, or suspend judgment about a problem, as well as assess the degree of confidence with their acceptance or rejection of the problem.

Activities in the classroom and laboratory refine students' critical thinking skills by encouraging independent thinking, creating an awareness of the strengths and limitations of using the scientific method, and developing intellectual perseverance. Assignments are designed to engage students in the scientific endeavors of critiquing texts and articles, evaluating the credibility of sources of information, interpreting data, making predictions, proposing experiments to address specific hypotheses, and generating and assessing solutions.

Development of critical thinking skills in the laboratory is encouraged by implementation of hands-on and inquiry-based activities in the lab that require students to interpret, analyze, evaluate, and explain ideas, processes, or problems that occur in nature.

Examples of how Biology courses promote critical thinking include activities such as:

- Identifying unknown bacterial cultures in BIOL 4200 (Microbiology)
- Identifying unknown insect families in BIOL 4070 (Entomology)
- Discussing the newest papers in BIOL 4590 (Advanced Ecology and Evolution)

Examples of how Environmental Science courses promote critical thinking include:

- Discussions on philosophy and ethics in ESC 4840 (Values and the Environment)
- Discussion on case studies in ESC 4100 (Environmental Law and Agencies)
- Using fruit fly cultures in Introduction to Environmental Science I and II labs to study basic population dynamics, ultimately analyzing a real data set before providing written commentary in a formal lab report. Students visit cemeteries and use the headstone data to construct survivorship curves. They construct a hypothesis and then test that hypothesis, concerning the impact of metal cations on lichens. They do a very authentic toxicity test where they use two-cycle semi logarithmic graph paper along with water fleas to determine the Lethal Concentration 50 of a salt solution. They go 'into the field' to measure trees and determine how much CO₂ each tree has absorbed (a carbon sequestration exercise) to see if planting a lot of little trees makes up for the destruction of one big tree. They also use lichens and methylene blue in a hypothesis driven exercise designed to determine whether the valence of a metal influences cation uptake by lichens. These are just a few of the activities done in ESC to promote critical thinking.

Select specific examples of how courses in the Geology curriculum foster analytical and critical thinking and problem solving include:

- Mineral identification of a set of 50 unknown minerals via their properties in Mineralogy
- Assessment of soil development from soil data collected by students in the lab and field as part of the Soils course
- Investigation of an unknown feature given in Geomorphology; students must propose hypothesis of the feature's formation and determine the methods by which they would investigate its genesis and development
- Mapping of geological units in an area and interpreting their subsurface geometry, etc., through measurements and observations in Field Methods
- Generation of their own research from hypothesis, through testing by collection of real-world data, generation of results, and offering of preliminary conclusions occurs in the required capstone course sequence of GEOL 4800 (Research Design) and GEOL 4900 (Sr. Research Project).

2.7 Degree Program Designs Provide Students with Solid Foundation

The BS degrees offered by the Department are united by a common set of educational goals as stated in the Departmental Goals ([Appendix 1-A](#)). Programs and courses have been developed with academic excellence as a goal, thereby giving students the experience of a superior quality education. As students progress through the Department's courses, they are provided with the opportunity to develop a firm grasp of the philosophy and methods of science, as well as an awareness of the importance of critical thinking and lifelong learning. As is appropriate for any natural science curriculum, hands-on/inquiry-based laboratory and field experiences are heavily emphasized. Each course offers exposure to both traditional information and contemporary frontiers in Biology, Environmental Sciences, and/or Geology. Ample opportunities exist for students to actively participate in the scientific process by becoming involved in collaborative research projects with individual faculty members. The Department's courses also serve to prepare students successfully for their post-graduate occupations – whether in the work force or graduate/professional education. In addition to the formal course work, faculty introduce many other activities that enhance the quality of the course and preparedness of our students such as engaging students in their research activities, making field visits to different sites, and inviting guest speakers.

In the Geology Program, students are active in their education and are provided multiple opportunities to engage in research, thus building on the foundation of basic Geology concepts learned through coursework in the program. The program is designed to progress students through the core courses of Geology and to learn the skills and tools of our science. In these courses, students are introduced to, practice, and become competent at these skills (as outlined in program SLOs in **Section 1 Learning Assessment**). During their senior year, students are required to take a two-course seminar series where they apply their base knowledge of geologic concepts, processes, and analytical skills to identify and solve a problem through an individual research project. The solid foundation that is laid by the program coursework allows the student to apply what they have learned throughout their academic experience to perform this research. Students also have opportunities to work with faculty on research, and many of these have resulted in presentations at professional meetings. Examples of recent senior research projects conducted by Geology students with faculty, some of which have been presented at professional meetings, include:

- Application of remote sensing to study the potential impact of 2020 wildfire events on the glaciers of Mount Baker, Washington
- Microplastics in a small stream: Storm response in a tributary to the Tennessee River

- Analysis of water samples and speleothem inside Racoon Mountain Caverns
- Experimental decomposition to understand ancient patterns in microbial preservation.
- Structural analysis of the Lookout Valley anticline
- Signal Mountain septic tanks and their potential runoff into Mountain Creek

These research opportunities not only give Geology students the ability to apply their foundation of knowledge learned in the program but allow them to expand upon this knowledge through application.

The curriculum in Biology, Environmental Science, and Geology is strong and reflects current standards, practices, and issues in the discipline.

2.8 Curriculum Progression, Depth, and Rigor

All majors in the Department have a detailed, rigorous, and sequential list of courses for each concentration in the major. Students are required to take these courses in a consecutive manner starting with the introductory courses which provide them with pre-requisites to enroll in the most advanced courses as they progress through their programs. In addition to introductory courses in the fields of study, other essential courses across disciplines such as Chemistry, Mathematics, English, and Physics may be required prior to taking some advanced courses in the majors. This strategy assures better preparation and a higher chance of success.

2.8.1 Biology Curriculum Progression, Depth, and Rigor

Biology students begin with two semesters of introductory Biology in a mixed majors setting followed by a third majors only introductory course focused on an introduction to animal and plant physiology and anatomy. Concurrent with the third semester of introductory Biology, our students begin taking the core courses of Ecology, Evolution, and Genetics. Following the core sequence, students begin taking upper-level Biology classes (as explained in section 2.1.3.1) to fulfill their Biology requirements.

2.8.2. Environmental Science Curriculum Progression, Depth, and Rigor

Similarly, students of Environmental Science begin with two semesters of introductory Environmental Science in a mixed and non-major setting, followed by the core courses that serve to provide a well-rounded view of topics crucial to Environmental Science. These topics include environmental law, environmental ethics, remote sensing, GIS, basic biology, scientific writing, statistics, calculus, and ecology. Students then complete a series of courses specific to their chosen concentration in the discipline. As a capstone experience, all seniors are required to complete a Senior Experience. This Senior Experience can take the form of research with a professor, an independent study, study abroad, or an internship in the larger Hamilton County (or beyond) community. As ESC majors progress through the various levels (from 1000- to 4000-level courses), the courses become more technical and more complex, in a manner consistent with the typical development of the student. Both depth and breadth are emphasized, and rigor is maintained by an accomplished and talented faculty.

2.8.3. Geology Curriculum Progression, Depth, and Rigor

Geology majors begin with two semesters of introductory Geology in a mixed majors and non-majors setting. The two-semester sequence was organized as Physical Geology and Historical Geology until the curriculum overhaul. Now, students have a choice of several courses in the major (See 2.1.6.3). Students are advised to take the prerequisite Chemistry I and lab courses before their 2nd year in the program to prepare them for Mineralogy. As a capstone experience, we require seniors to take Research Design, where they practice designing a scientific research project and develop presentation skills, and Senior Research Project, where they conduct original research on a focused topic and hone presentation skills. Geology

upper level required courses within each concentration allow students to select courses where they can investigate topics and regions in more depth. In terms of rigor, students must earn a ‘C’ or better in Historical Geology to enroll in Paleontology and a ‘C’ or better in Mineralogy, before proceeding to the next courses in the program. This sets high expectations that we hope students carry through their academic pursuits.

2.9 Written and Oral Presentation of Results and Ideas

Rhetoric & Composition I and II (ENG 1010 and 1020) introduce UTC students to basic written and oral communication skills. The Department’s introductory Natural Sciences lab courses (BIOL 1110L, BIOL 1120L, ESC 1500L, ESC 1510L, GEOL 1105L, GEOL 1110L and GEOL 1120L) incorporate writing and include a formal lab report. The lecture sections also include a writing component. Further details about written and oral presentations are provided below for each program.

2.9.1 Biology and Environmental Science Written and Oral Presentation of Results and Ideas

All Biology and Environmental Science majors take an intensive writing course in fulfillment of program requirements. This requirement may be met by completing Scientific Writing (ENGL 2820), or Departmental Honors (BIOL/ESC 4995). In addition, upper-level courses are designed to advance students’ abilities to express scientific knowledge effectively. Upper-level courses require students to create essays, research papers, lab notebooks, lab reports, literature reviews, critiques of journal articles, and give oral and/or poster presentations. For example, formal laboratory reports, written in the format of professional journal articles, are required elements for several introductory labs (BIOL 1110, BIOL 1120, and ESC 1510), elective labs (BIOL 3070 and BIOL 3260), and upper-level lab courses. Students in Immunology (BIOL 4120) and Virology (BIOL 4470) must participate in several formal discussions of recent articles dealing with discipline specific research topics and develop written reports summarizing these articles. Moreover, the relatively smaller class size of most upper-level courses provides opportunities for professors and students to interact and engage in discussions concerning current topics. For instance, in Ecology Laboratory (BIOL 3070), Soil Resources (BIOL/ESC 4680), Behavioral Ecology (BIOL 4310), Meiofauna Biodiversity (BIOL 4020), Pollinator Biology (BIOL 4100), Introductory Animal Physiology (BIOL 4210), and Ant Ecology (BIOL 4480), among other courses in the Department, students perform small research experiments, then have an oral or poster presentation at the end of the semester. This approach has helped students develop their research method skills and improve their public speaking and communication skills. Students in Environmental Law and Agencies (ESC 4100) and Values and the Environment (ESC 4840) are assigned specific roles and tasked with verbally advocating their interests during a mock public hearing or debate involving environmental ethical, law, and policy issues. This approach helps refine student public speaking skills and provides experience in a simulated real-world situation involving persons with diverse interests.

2.9.2 Geology Written and Oral Presentation of Results and Ideas

Geology majors are required to take Scientific Writing (ENGL 2820) or Technical Writing (ENGL 2810), which serve as prerequisites to the capstone research courses. Multiple courses in Geology require students to present their work in written and oral form. For example, Dr. Brock-Hon’s soils class conducts a research project where students present their hypotheses, methodology, data, and conclusions at the end of the semester as a formal presentation and submit their final product as a research report. Another example is Dr. Hossain’s GIS course, where students present their final project as a poster presented to the faculty and students of the program. Most impressively, each student who graduates from the Geology Program must conduct a one-semester research project that they design and carry out. During the semester prior to this research, students conduct literature searches and build a hypothesis that they will test. At the end of the research semester, students present their work as a poster (modeled after GSA’s poster sessions) to the faculty and students of the program. This ensures that every student has the opportunity to design

and conduct research and present that research both orally and in written format. This is a proud tradition of the Geology Program.

All upper-level Geology courses are designed to advance students' abilities to express scientific knowledge effectively. Most upper-level courses require students to do one or more of the following: create essays, research papers, lab reports, literature reviews, critiques of journal articles, and give oral presentations and/or poster presentations. Moreover, the relatively smaller class size of most upper-level courses provides opportunities for professors and students to interact and engage in discussions concerning current topics. Several courses also require students to provide a written reflection on their learning in an ePortfolio.

2.10 Discipline-Specific Research Strategies

At all levels of the curriculum, there is a strong emphasis on hands-on, inquiry-based investigative activities in laboratory and field settings. In the introductory courses, many investigative lab exercises require students to formulate hypotheses, design experiments, and collect and analyze data. Having the three majors in the Department facilitates cross-collaboration between different programs. There are examples of many collaborative projects that include Biology, Environmental Science, and Geology faculty. Many peer review publications, posters, and oral presentations have flourished from such collaborations.

Students can work with individual faculty members on research projects while earning credit (BIOL/ESC/GEOL 4997 or BIOL/ESC/GEOL 4998). Those who register for individual studies or research credit must complete an individualized course contract. This in-depth, independent research gives students valuable experience with laboratory and/or field equipment. During the last five years, 594 BGE students completed Research or Individual Study projects. Students enrolled in the University Honors College are required to complete a research project which includes a written thesis and an oral examination and defense of the thesis. Students of any major who are in the University Honors program conduct research with Department faculty members who serve as directors of their projects. Other students who are not in the University Honors program may also complete a written thesis and an oral examination to earn Departmental Honors. Additionally, the Office of Undergraduate Research and Creative Endeavors (URaCE) awards highly competitive SEARCH Awards (\$1,000 maximum) to fund wages, related travel, equipment, and supplies to qualified students. During the last five years, BGE faculty have directed 30 SEARCH awards and 113 Departmental Honors projects.

Initiatives often start with individual students who approach members of the faculty to express their interest in getting involved in a specific research subject. Many of these students successfully complete their research programs and present their findings at various regional and national scientific events including the Tennessee Academy of Science, The Association of Southeastern Biologists (ASB), the American Society of Plant Biologists (ASPB), and the Geological Society of America (GSA).

Students are encouraged to participate in internships to gain real-world experience in their field of study. They enroll in BIOL/ESC/GEOL 4998 for a maximum of four credit hours when a cooperative arrangement is made between UTC and an agency, organization, group, or business. This experience is designed to "provide students with a learning, observing, and work experience through direct contact with individuals working on problems related to their field." Internships may be paid or unpaid. Locations of the internships are mostly in the Chattanooga area; however, some students travel not only across the country but also to other countries for work-related experience. A faculty member in the Department must approve the internship and agree to serve as faculty coordinator. An internship contract must be completed and signed by the student, on-site supervisor, and faculty coordinator. Internships require a minimum of 30 hours of work per hour of credit earned. Students are also required to maintain a log of activities completed during the internship and must submit a final report at the end of the semester. An evaluation form is filled out by the supervisor and submitted to the faculty coordinator (this evaluation

may also take the form of an email). The student's grade is based on the quality of the student's work and the final report. During the last five years, 98 BGE majors were placed in internships at a variety of locations including the Chattanooga Zoo, Tennessee Valley Authority, Reflection Riding Arboretum and Nature Center, City of Chattanooga, Tennessee Aquarium, and Tennessee Department of Environment and Conservation, along with many other agencies and entities.

2.10.1 Biology and Environmental Sciences Field Work

In addition to experimental exercises conducted inside a laboratory facility, upper-level Biology and Environmental Science courses include fieldwork. Below are some examples of fieldwork experience through various classes.

- Students enrolled in Ornithology go into the field every lab period and have participated in a trip to Belle Baruch Field Station at Pawley's Island, South Carolina.
- Students enrolled in Mycology, Herpetology, and Ichthyology spend more than half of their lab sessions in the field.
- The Mammalogy course includes a significant field component, including a weekend trip to the Nantahala National Forest in Graham Co., North Carolina.
- In Limnology, students become knowledgeable of the physical, chemical, and biological characteristics of inland water ecosystems by collecting, analyzing, and interpreting data in local Chattanooga freshwater ecosystems.
- Students enrolled in Tropical Marine Ecology are required to participate in a one-week experience at a field station in the Bahamas (either the Gerace Field Station on San Salvador Island or the Forfar Field Station on Andros Island).
- A specialized class tour of the Tennessee Aquarium gives students of Comparative Vertebrate Zoology, Herpetology, and Ichthyology an opportunity to observe behavioral and physiological aspects of aquatic species. These trips instruct students in proper data collection techniques. Subsequent analysis of the data further trains students in classification and identification of specimens, interpretation of results, and formation of conclusions.
- In Ecology Lab, students conducted a long-term study (three years) of decomposition in Warner Park bioretention gardens in collaboration with Chattanooga Parks and Outdoors or mapped invasive plant species occurrence at Reflection Riding.

2.10.2 Geology Field Work

Diverse experiential learning opportunities are inherent to the Geology Program with opportunities for research (as discussed above) and through course embedded field trips and labs. Geology field trips in the curriculum help enforce basic concepts and processes that provide the foundation for research opportunities. Field trips allow students to reinforce their observation skills, practice sampling and collecting geologic data for later analyses, and be immersed in discussion at the location of interest. For example, the Geology Program conducts a spring seminar Field Experience course that culminates in a 10–14-day field trip to various places such as the Desert Southwest of the United States, and international destinations such as Costa Rica and Spanish Pyrenees. More recently, a trip to study the Geology of Scotland has been added. These field trips allow students to observe and examine a diversity of earth materials, structures, rock-types and relationships, landscapes, and soils, etc.

Select locations visited in Geology course field trips include:

- Building stone and UTC campus geology (Physical Geology and Earth and Environment Labs)
- Tellus Science Center (Historical Geology)
- Vulcan Bartow, GA Quarry; Ducktown Mining District; Ocoee River Gorge (Mineralogy)

- Trench deposits near Woodstock, GA; Metasedimentary rocks of the Ocoee Series at Chilhowie Dam; Chunky Gal Mountain, NC (Petrology)
- Cretaceous fossils at Coon Creek Science Center; Devonian fossils of Ross Formation western TN (Paleontology)
- Linville Falls and Blue Ridge, GA (Structural Geology)
- Deformed rocks near Chickamauga Lake; Woodall Shoals near Clayton, GA; various locations near Chattanooga for group projects (Field Methods)
- Various locations atop the Cumberland Plateau and eastern Highland Rim (Earth Surface Processes)
- Soddy and Hixson Wildlife Management Areas (Soils)
- Various sites along urban rivers and streams (Hydrogeology)

2.11 Assessment of Curriculum Strengths, Weaknesses, and Recommendations for Change

Having well-prepared senior students increases not just departmental graduation rates, but also the students' ability to secure a position after graduation, either in a graduate or professional program or in a career within their field.

2.11.1 Biology Curriculum Strengths

Strengths of the Biology curriculum include numerous opportunities for students to explore different topics within their chosen program. General Biology students and Preprofessional students both have the chance to select from various upper-level courses to meet graduation requirements. This flexibility provides students with a broader awareness and deeper understanding of principles fundamental to Biology by increasing the number and variety of scenarios when students must apply these principles. Furthermore, the curriculum facilitates an appropriate progression from introductory Biology to upper-level and highly specialized courses over a four-year period.

Students are well-prepared for upper-level courses by the requirements of the introductory Biology sequence and the core courses (Genetics, Ecology & Evolution), and are less likely to struggle and need to repeat a course. Their strong academic foundation allows them to be more confident in their skills and to take advantage of internship and research opportunities, thus making them more competitive.

2.11.2 Environmental Science Curriculum Strengths

The field of Environmental Science is broad and interdisciplinary. To that end, we offer six different concentrations. All ESC concentrations require the same core classes that not only provide students with the foundation they need but expose them to different disciplines that make Environmental Science so unique and valuable. Furthermore, the curriculum facilitates an appropriate progression from introductory courses to upper-level and highly specialized courses over a four-year period. The strong academic foundation the curriculum provides allows students to be more confident in their skills and to take advantage of internship and research opportunities, thus making them more competitive. The Environmental Science Program takes advantage of many favorable conditions that Chattanooga and surrounding areas have to offer. The presence of biologically rich rivers and streams, mountains, ridges and valleys, and forests present our Environmental Science Program with a biological landscape that enriches the program. Chattanooga's history as an industrial city with associated legacy pollution and recent initiatives to become a more sustainable city aligns well with the programs of study in the Environmental Science Program. These local and regional conditions offer numerous research opportunities for students and faculty to explore different topics within their chosen program.

2.11.3 Geology Curriculum Strengths

The personalized education inherent in the smaller Geology Program, along with direct faculty advisement of majors, allows for close ties to students within the program and for feedback in courses about the curriculum. The ability for faculty to meet and discuss student learning outcomes and their impact on student learning through assessment has allowed for changes in pedagogy, incorporation of technology, etc., within the classroom. Geology has a strong field component. The close proximity of three geologic provinces provides field areas that are geologically diverse, and students can easily conduct field exercises nearby. These good exposures provide opportunity to develop strong field skills such as using the Brunton compass, measuring sections, identifying rock types and depositional environments, measuring joint planes, generating data for stereographic projections, and identifying soil types. These skills are applied in a variety of fields including stratigraphy, structural geology, paleontology, economic geology, petrology, and soils, among others. Geology faculty work hard to incorporate critical thinking and problem-solving based activities in each Geology course.

2.11.4 Curriculum Weaknesses and Recommendations for Change

2.11.4.1 Bottleneck Courses

A principal challenge in the curriculum of Biology, Geology, and Environmental Science Programs, is the high demand for upper-level courses. To address this problem, all three program areas (Biology, Environmental Science, and Geology) have undergone major recent Curriculum changes. In Biology, the curriculum was updated during the Fall 2023 for all three concentrations (General, Preprofessional, and STEM) and we are hopeful that the new curriculum will reduce bottlenecks we had experienced in the past with students unable to enroll in Survey classes. Additionally, recent changes in the prerequisites of many upper-level Biology classes should make it easier for our students to enroll in these classes.

In Environmental Science, enrollment continues to grow, even while the other programs either decline or remain steady. More students produce more demand, which is hard to meet given the limited number of current ESC faculty in place combined with the absence of any new hires. Such a situation results in bottlenecks, especially in the Survey courses. Additional faculty would allow for additional coverage and potentially new courses. In Environmental Science, notably in Policy and Planning, the curriculum has been adjusted to provide more flexibility in terms of the choices offered to students. The spatial science courses (Remote Sensing and GIS) have been re-envisioned to eliminate scheduling conflicts. Currently, the different versions of the courses (ESC vs. GEOL) do not align in terms of credit hours (3 vs. 4). The respective courses across the two disciplines are interchangeable, and it would behoove the department if the courses aligned more in terms of credit hours and intent, with the key faculty then being able to teach either course interchangeably.

In Geology, we currently have one person to teach petrology, structural geology, and dynamic earth (Plate tectonic) courses. In the future, and with the growth of the program, we hope to add faculty who will help relieve the burden and offer expanded courses in this area. The Geology faculty have also discussed the need for someone trained in geoscience education who may be able to work with local high schools, boost recruiting efforts and community engagement, and bring more underrepresented students into our science. The Geology program also lacks key instruments that are critical for faculty research and student research training. When Dr. Mies retired in Spring 2023, the in-house XRD system was also retired. The current faculty have plans to write grants and acquire a new XRD, along with a handheld XRF. Drs. Manning-Berg and Brock-Hon have also submitted two NSF MRI proposals to acquire an Environmental SEM with no success. They plan to renew their efforts in Spring 2024.

2.11.4.2 New Faculty

In Biology, one of our biggest issues regarding curriculum is that we do not have enough faculty to teach Cell and Physiology classes. Our Biology program has been experiencing a steady decline in the number of Preprofessional students enrolled; and, according to our Biology advisors, one of the reasons for that decline has been the lack of Cell/Physiology classes and related research opportunities. While the logical solution would be to hire more Cell/Physiology faculty, it is hard to justify to university administrators the hiring of additional Biology faculty when the number of students decline in the major.

In Environmental Science, since the last program review, we have not hired any new tenure-track faculty and we have only hired one non-tenured faculty. One of our Environmental Science colleagues recently passed away. In the interim, this position was filled with a visiting lecturer for two years. We are currently searching for a tenure-track replacement. Our Environmental Science program has shown robust growth since 2018 and we desperately need more tenure-track faculty to teach in areas such as Climate Change and Wildlife Conservation. An additional difficulty in properly addressing an environmental science curriculum exists in the very nature of environmental science itself. It is incredibly broad and interdisciplinary, and having the expertise on hand to adequately address the many different aspects of environmental science is nearly impossible. For this reason, Environmental Science has always relied on course offerings from other departments. Unfortunately, we have very little control over the curriculum of other departments and unexpected changes to their curriculums/course offerings often prompt the need for revisions in ESC curriculum. It takes time for such changes to occur, making the necessity of countless petitions, at least in the short term, unavoidable.

In Geology, since our last program review, three full professors and one lab coordinator retired. Fortunately, these vacancies were filled, and we have added a Geology lecturer. This has helped the geologists even out course loads comparable to the Biology and Environmental Science faculty loads. We are currently searching for a hydrogeologist to replace a faculty member who resigned in Summer 2023.

3 Student Experience

3.1 Student Evaluation

Students in BGE evaluate their learning through Course Learning Evaluations. In addition, National Survey of Student Engagement (NSSE) is distributed to first-year students and seniors each year.

3.1.1 Course Learning Evaluations

Each semester, students are given the opportunity to evaluate their learning in their courses, except contract courses such as thesis, dissertation, independent study, clinical, co-op, exchange, and student teaching. The Office of Accreditation and Assessment (OAA) administers the course learning evaluations using online survey software. Additional questions may be added by departments. The questions in each area are shared in Table 3.1.

Table 3.1 Course Learning Evaluations

Focus Area	Questions
Course Learning Outcomes	1. I have read and understand the course learning outcomes in the syllabus and/or in Canvas. 2. The course content addresses the course learning outcomes. 3. The course structure (organization) helps me in achieving the course learning outcomes. 4. I believe that I am achieving the course learning outcomes.
Student Contributions to Learning	1. I keep up with all course readings and the work assigned. 2. How much time outside of class do you work each week? 3. How many classes did you miss? 4. In this class, did you use any of the following resources (Choose all that apply)?
Course Content and Delivery	1. The course encourages my use of critical thinking skills. 2. The way this course is delivered encourages me to be actively engaged. 3. Please mark all types of pedagogy that were used in the course. 4. Please list components of this course not listed above that assisted with your learning.
Course Instruction	1. The instructor assists students with achieving the course learning outcomes. 2. The instructor provides constructive feedback on graded coursework. 3. The instructor responds to questions and emails within the time frame stated in the syllabus.
Course Changes and Improvements	1. What are the strengths of this course? 2. What changes, in any, would you make to the course that would aid in your learning?

Course learning evaluations are opened to students three weeks prior to the last day of regular classes (and close before final exams begin). Students are emailed with instructions on how to access course evaluations through the student MyMocsNet portal. They have until the end of the last day of classes to complete their ratings.

After final grades are due, course learning evaluation results are available to faculty. Results are only available for classes with five or more responses or at least a 50% response rate.

These data are reported by faculty in their annual performance reports and are used to improve course instruction for following semesters. In their performance reports, BGE faculty must report and reflect upon these results, and are recommended to make comments on how they plan to address strengths and/or weaknesses in the course based on the evaluations. Data are compared with College of Arts and Sciences and university results. These data are also summarized for courses and instructors and made available to students through their MyMocsNet portal. Course learning evaluations results for 2018-2023 are reported in **Section 4.4 Quality of Instruction**.

3.1.2 National Survey of Student Engagement (NSSE)

The NSSE is administered each year by OAA and is available to all first year and senior students. This survey is used to determine the extent to which the students are actively engaged in various aspects of their undergraduate education. The survey contains questions about students' satisfaction with UTC, curriculum, faculty involvement, and cultural experience. Questions from this survey (Likert-like scale) that directly relate to the quality of faculty teaching effectiveness are:

1. Quality of interactions with faculty members.
2. Talked about career plans with faculty members or advisor.
3. Worked with faculty member on activities other than coursework (committees, student groups, etc.).
4. Discussed course topics, ideas, or concepts with a faculty member outside of class.

The number of students who took the NSSE was very low considering the total number of majors in the department with only 49-140 taking the survey annually between 2019-2023. NSSE data are presented in more detail in Tables 1.5 and 1.6 in **Section 1.5 Institutional and Informal Department Surveys**.

3.2 Student Exposure to Professional and Career Opportunities

3.2.1 Biology and Environmental Science Building Professional Skills

A key step in success in a science career is hands on experience in the lab and/or field. The Biology, Geology, and Environmental Science department offers a wide variety of professional and career opportunities in the form of internships, seminars, field trips, conference attendance, and conference participation. BGE students can participate in original research with faculty members through multiple avenues including the university's Scholarship, Engagement, the Arts, Research, Creativity, and Humanities (SEARCH) Award, Departmental Individual Studies (BIOL 4998), and Department Honors Thesis (BIOL 4995). Since 2018, 16 students earned Departmental Honors upon graduation. Twenty-two students received grants from the SEARCH award program (19.5% of all awards to the university) between 2018-2023. Seven hundred and twelve (712) students (all disciplines) have been mentored in Individual Studies and Undergraduate Research as part of their graduation requirement ([Appendix 4-L](#)). In Fall 2022, the department launched Sustainable Mocs, a residential learning community (RLC), for biology, geology, and environmental science majors. The RLC introduces students to the interdisciplinary nature of the department and provides numerous opportunities for them to interact with the BGE community and with the scientific community outside of UTC. One of the highlights of the Sustainable Mocs RLC is the experiential learning component that provides opportunities for students to engage with regional aquariums, museums, natural areas, and zoos. Similarly, other students (primarily ESC students in their efforts to satisfy their Senior Experience requirement) have participated in several internships at the [Chattanooga Zoo](#), the Environmental Protection Agency (EPA), the Tennessee Department of Environment and Conservation (TDEC), the [Tennessee Valley Authority \(TVA\)](#), [Chattanooga Arboretum](#),

[Tennessee Aquarium](#), and [City of Chattanooga](#), providing hands on experience with non-profit agencies. Additionally, other locations for recent ESC student internships include but are not limited to Neel-Schaffer, the Army Corps of Engineers, Whippoorwill Farm Day Camp, Walt Disney World Horticulture, Mitigation Resources of North America, OtherWay of London, Tennessee Wildlife Resources, Harrison Bay State Park, and Gaia Environmental Consulting. This list effectively underscores how our ESC students complete internships with a wide array of diverse agencies. The students are truly limited only by their own imaginations and their ultimate career aspirations (it is always appropriate to make sure an accepted internship merges well with what the student ultimately wants to do as a career). During the current review period, 149 undergraduate students gave academic and scientific presentations at professional conferences and through opportunities provided on campus. These are reported in [Appendix 4-M](#) for all disciplines.

3.2.2 Geology Building Professional Skills

For students to be successful and adept at relating to professionals in and out of career settings, the Geology Program works to prepare students for future opportunities by training them in field data collection and research design, implementation, data synthesis, and presentation. In some courses, students are required to build an ePortfolio where they reflect on their learning, show examples, and list skills learned in the course. This encourages professional communication of their learning and provides expanded information on their scholarship that can be linked in a resume and used in graduate school and job applications. Students are also given opportunities to meet with practicing Geology professionals in and out of the classroom. Opportunities outside of the classroom are available through student club activities, speakers, and involvement in professional organizations.

Skills necessary to work and relate on a professional level are practiced throughout the Geology curriculum. Most labs require some form of group work in the classroom or lab setting. The ability to work collaboratively is very important when working on a professional level. All students in the Geology Program practice their communication skills with presentations in required and elective courses. For example, oral presentations are required in Sedimentology and Stratigraphy (GEOL 3540), Earth Surface Processes (GEOL 4080), Soil Properties, Genesis, and Development Across the Landscape (GEOL 3220), Geology Field Experience (GEOL 4960), Research Design (GEOL 4800), and Senior Research Project (GEOL 4900). Students practice their scientific writing skills in Research Design and Senior Research Project with submittal of a research grant proposal and written presentation of research on a poster. The capstone courses require students to formulate a research hypothesis, design a project to test the hypothesis, collect data, and make preliminary interpretations on that data. Students make class presentations on background information and data collection during the semester. At the conclusion of the semester, students present their detailed research project to the department as a poster during a poster session where they must communicate their science orally to session attendees. With their capstone research projects, most students choose projects within the local area, and must work to figure out field logistics and site access, thus encouraging interaction outside the university community. Because projects must be completed within one semester, they must also work on time management skills. Field note-taking skills are critical for students who plan to work as professional geologists. Most Geology courses with a field component require students to maintain a field notebook evaluated as part of their grade. Multiple Geology classes contain problem-based lab exercises where students are presented with, or collect their own, real-world data. For example, Dr. Brock-Hon's Soil Properties, Genesis, and Development Across the Landscape students spend four days collecting soil data and samples from a field site. They choose which lab analyses to perform and collect their lab and field data to make interpretations on formation of the soils before presenting their final interpretations to the class. Students in GIS and Remote Sensing must prepare a thematic map for Tennessee using real data such as geologic map data, seismic hazard info, and other geographically derived data relevant to the map.

Several Geology courses are designated as Experiential Learning, or Think Achieve, courses. This designation indicates that the course “promotes hands-on experiences that build competence and critical thinking.” The courses designated as Experiential Learning are: Mineralogy, Earth Surface Processes, Soil Properties, Genesis, and Development Across the Landscape, Geology Field Experience, and Senior Research Project.

Over several years, Dr. Brock-Hon’s Earth Surface Processes students have had the opportunity to learn about geophysical techniques applied to geomorphic questions alongside project geophysicists from a local geotechnical company. Mineralogy students have worked with the Southside Chattanooga Lead Superfund Site on lead contamination in soils, and they have received samples from TDEC. This interaction with Geology professionals in-and-out of the classroom has allowed them to work and learn alongside Geology professionals in a field setting. Recently, Dr. Brock-Hon brought a local professional from Terracon to discuss the use of drones in research. Some students watched a drone survey take place in the field alongside this professional during active research. Dr. DeVries’ students collected streamflow data in the field with a USGS technician. In Dr. Manning-Berg’s Paleontology course, students toured museums and interacted with paleontologists in a lab setting. In her Astrobiology course, students were able to speak with one of the scientists who helps operate the Mars Rovers. Dr. Hossain’s upper-level GIS and Remote Sensing courses required emailing or speaking with GIS professionals to acquire data, thus practicing their professional communication skills.

3.2.3 Student Clubs, Building Professional Skills

Biology, Geology, and Environmental Science supports a wide array of student clubs and organizations, and these groups help expose students to professional and career opportunities appropriate to the field. Participation also ensures that students are exposed to diverse perspectives and experiences through extracurricular activities.

- ASPRS Chapter: The University of Tennessee at Chattanooga (UTC) Chapter of the American Society of Photogrammetry and Remote Sensing (ASPRS) is an administrative sub-unit of the Mid-South Region. The purpose of the Chapter is to function in support of the Region and Society as outlined in Article II of the Society Bylaws. This chapter provides the students of BGE and UTC with the opportunities: (1) to advance scientific knowledge in the various disciplines of photogrammetry and remote sensing including, but not limited to, aerial surveying and mapping, photo interpretation, spatial information management, and the related sciences in furtherance of the public welfare and in the interests of those who practice in the profession and those who use its services and products; (2) to encourage public programs relating to photogrammetric and remote sensing endeavors such as mapping, charting, cadastral surveying, and resource and environmental surveys and studies, working with governmental and private organizations in furthering such programs; (3) to foster understanding and cooperation and to expedite the exchange of knowledge and ideas among the members of the Society and with those of other national and international organizations with similar or related interests; (4) to contribute to the education of the general public about the nature of, and benefits to be realized from, the products and services provided by the profession; (5) to further the national and international recognition and understanding of the profession and its various disciplines; (6) to establish and maintain a code of ethics for the profession; (7) to establish and apply standards for competence and performance for the various disciplines represented in the Society as appropriate to the welfare of the general public; (8) to hold meetings for the exchange of scientific and technical information and for the exhibit of products and services; (9) to encourage, publish and distribute books, periodicals, treatises and other scholarly and practical works applicable to the disciplines in the Society; (10) to encourage and support education programs essential to the development and maintenance of the profession; and (11) to recognize and honor the leaders of the

profession.

- Association of Southeastern Biologists, Geological Society of America: Students in the program are encouraged to become student members of the Association of Southeastern Biologists (ASB) or Geological Society of America (GSA), depending on their disciplinary area. Annually, our department sends 8-12 students (grad + undergrad) to ASB and GSA meetings. At meetings, students may attend career, diversity, or workshop-like luncheons, meet with professionals working in their respective fields of interest, interact with and learn about prospective employers, and meet potential graduate school mentors. Even more, many students gain the confidence to talk with other professionals and this reinforces their confidence and future interview ability.
- Beta Beta Beta (Tri-Beta): Tri Beta is an honor society for students, particularly undergraduates, dedicated to improving the understanding and appreciation of biological study and extending boundaries of human knowledge through scientific research.
- Ecological Decisions for a Global Environment (EDGE): EDGE promotes sustainable living on the UTC campus and greater Chattanooga area. The club fosters interactions among faculty, students, environmental professionals, and the community to promote discussions on management, conservation, and sustainability. EDGE is open to all majors and meets every other Tuesday during the fall and spring semesters. EDGE hosts events like Compost-O-Ween, where every fall, pumpkins are collected from the general community for composting. EDGE also hosts litter clean-ups throughout Chattanooga and surrounding areas. EDGE promotes sustainability on campus through supporting recycling, composting, and clean energy. EDGE is a voting member of the Environmental Task Force responsible for dispersal of Green Fee Funds.
- Geology Club: The UTC Geology Club, open to all UTC students, provides opportunities for Geology majors to promote geology and interact with non-majors. In turn, the club gives non-majors who either do not want to change their major, or are too far along in their major to change, opportunities to experience geology. The Geology Club focuses on having fun while learning about geology and participating in geology-based activities. Club members also provide services to the department and community by offering tutoring assistance, performing outreach to local schools and organizations, and helping interpret geology for local organizations and businesses. Outreach events have included participation in the Chattanooga Road Scholar “Generations Day” Program to answer questions about local geology, set up a display about the geology of the moon, and engage with community members who attended a Barnard Astronomical Society event for the “International Observe the Moon Night”. Club members also manned a table at the local Farmer’s Market “Smart is Cool” event to talk about geology. Additionally, students enjoy social activities such as camping and mineral hunting with others who are interested in geology.
- GIS Club: The purpose of University of Tennessee at Chattanooga (UTC) Geographical Information Systems (GIS) Club is to engage the students of UTC to accomplish the following geospatial technology related activities: (1) to advance scientific knowledge in the various disciplines of GIS and remote sensing including, but not limited to, digital mapping, image/photo interpretation, spatial information management/analysis, and the related sciences in furtherance of the public welfare and in the interests of those who practice in the profession and those who use its services and products; (2) to encourage public programs relating to GIS and remote sensing endeavors such as mapping, charting, cadastral surveying, and resource and environmental surveys and studies, working with governmental and private organizations in furthering such programs; (3) to foster understanding and cooperation and to expedite the exchange of knowledge and ideas among the members of the club and with those of other national and international organizations with similar or related interests; (4) to serve

the members and the public as a central source of information, reference, and consultation on the disciplines represented in the club; (5) to contribute to the education of the general public about the nature of, and benefits to be realized from, the products and services provided by the geospatial profession; (6) to further the national and international recognition and understanding of the geospatial profession and its various disciplines; (7) to establish and maintain a code of ethics for the profession; (8) to hold meetings for the exchange of scientific and technical information and for the exhibit of products and services related to different state of the art geospatial technologies; (9) to encourage, publish and distribute books, periodicals, treatises and other scholarly and practical works applicable to the disciplines in the campus student community; (10) to recognize and honor the leaders of the profession.

- Iota Beta: Iota Beta is UTC's chapter of the Society of Sigma Gamma Epsilon (SGE) which recognizes scholarship and professionalism in the Earth Sciences. This chapter, in its third year, is still relatively new and has been focused on recruitment. Geology and Environmental Science students who meet specific SGE requirements are invited to participate. SGE emphasizes providing service to the local community and our chapter has adopted a local waterway at Rainbow Lake. Each year, students spend a few Saturdays cleaning up the area before going for a hike.
- Pre-Professional Clubs: Several pre-professional clubs on campus are advised by BGE faculty. These include Pre-Medical Society, Pre-Dental Society, and Pre-Optometry Society. Other UTC pre-professional organizations such as Pre-Pharmacy, Pre-Physician Assistant, Pre-OT/PT, and Remote Area Medical Clinic clubs are advised by other departments. All plan regular activities to enrich students in their designated area. Professionals present at meetings and provide mentoring and shadowing opportunities. These clubs are united by a Pre-Professional Council managed by the Assistant Director for Pre-Health Advising. To learn more about the Pre-Health Advising, visit <https://www.utc.edu/enrollment-management-and-student-affairs/pre-health-professions-advising>.
- Wildlife Zoology Club: The UTC Wildlife Zoology Club (WZC) was established as a departmental and UTC club in 2012. The club has been quite popular and successful throughout the years and has exposed interested students to a wide variety of experiences such as service projects at wildlife rehab facilities, birdhouse builds, behind the scenes field trips at zoos, a wetland restoration project, departmental service projects, and community outreach initiatives. The club has likewise been active in hosting wildlife-related speakers. Perhaps the most notable feature of the UTC WZC is that it is now an official student chapter of the internationally known Wildlife Society, which is perhaps the oldest and most important wildlife organization in existence. All officers must be paying members of the Wildlife Society. For three years, the Club operated under the guidance of The Wildlife Society as a probationary chapter (20-21, 21-22, 22-23). To be an official student chapter, the WZC was required to meet all Wildlife Society deadlines, submit the necessary financial and annual reports, and host a speaker that was also a member of the Wildlife Society each year. Across the last three years, the WZC hosted Jamie Feddersen, Tennessee Wildlife Resources Agency Certified Wildlife Biologist, who talked about mallards and migratory gamebirds, Jeremy Hooper, Tennessee Department of Environment and Conservation, who talked about urban coyotes, and Erin Patrick, Wildlife Society Tennessee Chapter President and Knoxville District Supervisor of USDA Wildlife Services, who talked about her experiences in the field and a variety of career opportunities through the US Department of Agriculture. Soon, the WZC will host Tish Gailmard, American Red Wolf SAFE Education Task Force and Reflection Riding Arboretum, who will speak about red wolves. Perhaps the most notable task completed by the WZC in the last year was their participation in the annual Wildlife Society Southeastern Conclave at Cleveland State Community College. Colleges and

universities from across the southeast competed in quiz bowl and other wildlife-focused events. This was the first Conclave for the UTC WZC and an important networking event. The WZC Conclave team was entirely female and comprised mostly of Environmental Science majors. The team had a respectable showing in telemetry, archery, and rifle.

- **Women in Natural Sciences (WINS):** WINS student organization supports women who are pursuing careers in the natural sciences through a variety of educational, mentoring, networking, and community-building opportunities. Led by student officers and advised by BGE faculty, WINS delivers programming and participates in outreach activities each semester that promote the achievements of women scientists and highlight the challenges and rewards associated with being a woman in science. Examples include topical monthly meetings, tabling events during Women's History Month, movie screenings, and participation in relevant Chattanooga community events. During the 2023-24 academic year, WINS is planning to sponsor a symposium during Women's History Month at the Association of Southeastern Biologists meeting in Chattanooga that will feature UTC women scientists describing their current research in biology and how it has been inspired by the past work of women in the field. Through this symposium, WINS aims to elevate the significant and diverse contributions of women in the biological sciences to a broad audience.

3.2.4 Sustainable Mocs Residential Learning Community (RLC)

In the 2022-2023 academic year, BGE initiated Sustainable Mocs RLC, a residential learning community. The community enrolls freshmen from all programs within the department. Students enrolled in a First Year Experience class must take other General Education classes together as a cohort. Sixteen students enrolled in the program for the inaugural year, increasing to 20 in the current year (2023-2024). Each semester, multiple activities such as advising, social events, and field trips with behind-the-scenes tours (TN Aquarium, Chattanooga Zoo, Tellus Museum) are planned. Data provided by the Dean of the College of Art and Sciences indicated that students enrolled in RLCs had a 4.5% increase in retention (over normal Fall to Spring freshmen retention) and higher GPAs than freshmen not enrolled in an RLC.

3.2.5 Teaching and Learning Garden

The L.L. Roper Teaching and Learning Garden (TLG) is housed in the College of Arts & Sciences and managed by Dr. Jose Barbosa in BGE. The garden demonstrates our commitment to learning by doing (i.e., engaged or experiential learning) and to interdisciplinary connections across the College. The garden is, in many ways, the embodiment of both the arts and the sciences. Students work in this space, getting their hands dirty as they interact with the subjects of study--plants, soil, food scarcity, and more. Through their work, students make connections across the natural sciences, the social sciences, the humanities, and the arts. Since its inception in May 2016, the Teaching and Learning Garden has had a great impact on the community and our students. The TLG donates fresh, agrochemicals-free produce from the garden to the Chattanooga Community Kitchen ([CHATT Foundation](#)) every semester. The Urban Gardening courses (BIOL 1140 and BIOL 4370) are taught every semester and are open to all UTC students. Course activities are distributed among two field plots: a larger plot of 636 m² (about twice the area of a tennis court) and a smaller plot of 120 m² (about half the area of a tennis court). In addition, the greenhouse contiguous to Holt Hall is fully dedicated to supporting urban gardening activities. Students mainly use this facility for seedling production during winter and maintaining the germplasm collection of some tropical and medicinal plants. The TLG has opened a window of opportunities for successful multidisciplinary collaborations across campus and grants applications to many federal agencies including the USDA. In 2022, we secured funding for Agriculture & Nutrition for Girls While Encouraging Leadership & Stem-Enrichment (ANGELS). This project endeavors to complement traditional and non-traditional STEM-education with experiential agricultural activities to promote a successful middle school to college pathway leading to STEM-related careers. A great deal of collaboration will be established

between BGE and two community partners (Hope for the Inner City and Wild Violet Permaculture) and two high schools in Hamilton County (The Harrison Bay Future Ready Center (HBFRC) and STEM School of Chattanooga). Through this partnership, UTC BGE students and engineering Mechatronics students will be mentoring high school students. Together, through hands-on experience, teamwork, empowerment, and peer-to-peer interaction, UTC and high school students will design and implement in-school and community activities. In this project, they will improve, adapt, and test a farm MULE (Mobile Utility Learning Equipment) created by the HBFRC high school students, in the Teaching and Learning Garden. Also, in collaboration with students and faculty of the Mechatronics program, we plan to scale up a FarmBot to be adapted for the TLG.

3.2.6 BGE Fall Festival

For the last several years, BGE has organized a fall student-focused social event called Fall Festival. This is an opportunity for all students and faculty to come together and socialize while participating in fun activities and trivia. Several student-led groups such as EDGE, WINS, Geology Club, Wildlife Zoology Club, and pre-professional clubs along with campus offices (such as the Graduate School and the CAS Advising Hub) attend. In Fall 2023, we gave away plants from the Teaching and Learning Garden and collected donations.

3.2.7 BGE Awards Banquet

Each academic year culminates with an awards banquet in celebration of multiple achievements by outstanding undergraduate and graduate students. Approximately 30 honorees and their guests are provided an opportunity to engage with peers, faculty, and staff over dinner. During the awards presentation, accomplishments of each awardee are highlighted onstage by a BGE faculty member. Recipients of scholarships in each BGE discipline are recognized; and, in addition to those who have distinguished themselves academically, students are rewarded for contributions to the department in areas of research, leadership, and service as well as perseverance in their academic pursuits even when faced with extreme challenges. The banquet has an added benefit of exposing students to a wide variety of research and service projects at both the undergraduate and graduate levels within BGE.

3.3 Student Application of Learning Outside the Classroom

Our undergraduate students have ample opportunities to apply what they have learned through research with faculty members. Since 2018, the BGE faculty have mentored 718 undergraduates. One hundred and forty-eight undergraduate students have presented their research at scientific conferences and 51 students have been authors on publications in peer reviewed journals.

3.3.1 Biology and Environmental Science

Field trips or field work components are included in several Biology and Environmental Science courses including Ecology Lab (BIOL 3070), Environmental Survey Methods (BIOL/ESC 3400), Meiofauna Biodiversity (BIOL 4020), Entomology (BIOL 4070), Parasitology (BIOL 4085), Herpetology (BIOL 4090), Pollinator Biology (BIOL 4100), Ichthyology (BIOL 4110), Mammalogy (BIOL 4140), Mycology (BIOL 4150), Ornithology (BIOL 4170), Plant Morphology (BIOL 4180), Plant Taxonomy (BIOL 4190), Field Botany (BIOL 4195), Wildlife Education and Rehabilitation (BIOL 4335), Tropical Marine Ecology (BIOL/ESC 4400), Limnology and Reservoir Ecology (BIOL/ESC 4520), Amphibian Ecology and Conservation (BIOL 4512/ESC 4512), Introduction to Soil Resources (BIOL/ESC 4680), and Urban Gardening (BIOL 1430/4370).

As discussed in **Section 3.2**, our students also participate in a diverse range of internships and opportunities for research with our UTC community partners. During the review period (Fall 2018-Fall 2023), there were quite a few students in the Environmental Science Program that completed an

internship for credit (awarded as ESC 4910). Additionally, many students gained museum experience by preparing, cataloging, and preserving specimens held within the UTC Natural History Museum.

3.3.2 Geology

The Geology Program provides students with ample opportunities to apply what they have learned to situations outside of the classroom. These opportunities range from service projects with the Geology Club to field courses designed around travel to study geology inside and outside of the United States.

- **Student Club Activities:** Examples of club activities include the UTC Geology Club's participation in local elementary schools STEAM or Science Night activities, and the recent Observe the Moon Night hosted by the Barnard Astronomical Society. Each semester, Geology Club members serve as tutors for Physical Geology and Historical Geology students. Club activities also include caving, fossil and mineral hunting, and camping trips so that students may observe geologic phenomena outside of the classroom. Students who are part of UTC's Sigma Gamma Epsilon chapter, Iota Beta, participate in local river cleanups at Rainbow Lake throughout the year, and they attended the SGE Biennial Convention in Selmer, TN at Coon Creek Science Center in September of 2022.
- **Presentation of Research:** Students who participate in research with faculty are often encouraged to present their work at meetings such as the Tennessee Academy of Science (TAS), Southeastern Section of the Geological Society of America (GSA), and the Annual Meeting of the Geological Society of America. Over the review period, over 80 presentations have been made by students at regional and national meetings. Four Geology majors have applied for and received SEARCH Awards totaling more than \$3,000.
- **Teaching Assistants:** Teaching Assistant (TA) positions are available to students to help in Historical Geology (GEOL 1120), Introductory GIS and Remote Sensing (GEOL 2100), Mineralogy (GEOL 3410), Petrology (GEOL 3420), Paleontology (GEOL 3530), and Sedimentology and Stratigraphy (GEOL 3540). Students are selected for the TA positions based on their course grades, ability to interact and explain concepts, and availability.

3.4 Student Exposure to Diverse Perspectives and Experiences

A core component of the BGE strategic plan is to expand and enhance diversity and inclusivity in the sciences. We have identified three broad areas to focus our efforts: 1) increase and maintain diversity and inclusivity within our department, 2) expand and enhance cultural and intellectual diversity, and 3) implement training and policies to prevent bias and discrimination. The following highlights some of the department's achievements to date in these areas.

3.4.1 Increase and Maintain Diversity and Inclusivity within our Department

The BGE department has tried to recruit and retain diverse faculty, staff, and students who offer different perspectives and help create a more inclusive environment. The BGE department consists of 38 full-time faculty and staff members. Of the staff, all three (3) are women. BGE faculty members consist of 21 women and 17 men and of those individuals, five (5) women and three (3) men represent members of the BIPOC community. Recently, the BGE department participated in the Institute of Teaching and Mentoring (ITM) conference with Academic Affairs. The ITM Conference hosts the largest gathering of underrepresented doctoral scholars. Additionally, BGE members have participated in outreach and speaking engagements at local middle and high schools to build connections with local students and have mentored undergraduate students through the TRIO program.

In 2021, the BGE department implemented a climate survey with the aim to "...identify, challenge, and eliminate practices that are barriers to full inclusivity and equity in our learning community." The survey was administered and reviewed by Dr. Alex Zelin (formerly in UTC Psychology). A total of 200 students

participated in the survey and the majority identified as female, women, white, heterosexual, and not having a disability. Findings from the survey showed that students had an overall favorable view of the department as a welcoming place for diverse students. The BGE climate was perceived as welcoming, supportive, inclusive, and accepting of people with multiple identities. Areas of improvement, as indicated by the students, included increasing hiring of diverse faculty and the inclusion of diverse researchers through assignments and research presentations. The DEI committee has used the findings from the survey to evaluate and adjust current conditions.

3.4.2 Expand and Enhance Cultural and Intellectual Diversity

The BGE department has also created faculty committees that focus on informal education activities and public engagement that expose students to diverse perspectives and cultivate an inclusive, welcoming environment. The Diversity, Equity, and Inclusion (DEI) Committee aims to organize and promote meaningful action in BGE to ensure equity, inclusion, and participation of our Black, Indigenous, and people of color (BIPOC) students, faculty, staff, and other colleagues. The DEI Committee and the Social Media Committee have implemented diversity awareness campaigns that highlight the scientific contributions of individuals from diverse backgrounds. For example, the ‘This is What a Scientist Looks Like’ series uses the Holt Hall hypersign televisions to highlight diverse scientists in various fields in biology, geology, and environmental science.

During the 2020-21 academic year, the DEI committee coordinated a DEI seminar series with the aim of introducing students to diverse research interests and perspectives in the areas of indigenous science education, Black studies, evolutionary ecology, geology, and urban ecology. The department virtually hosted six seminar speakers.

Table 3.2 Guest speakers and areas of expertise for the 2020-21 DEI Seminar Series

Speaker	Institution	Area of Expertise	Seminar Topic
Dr. Stephanie Masta	Purdue University	Indigenous Education	Inclusivity in the classroom
Dr. Michelle Thompson	City College of New York	Black Studies	Diversity and Inclusion for BIPOC in Higher Education
Dr. Elaine Swafford	Chattanooga Girls Leadership Academy	Educational Consultant	
Dr. Henry Bart	Tulane University	Evolutionary Ecology	
Dr. Gregory L. Easson	University of Mississippi	Geology & Geological Engineering	Diversity in Geosciences
Dr. Chris Schell	University of California - Berkeley	Urban Ecology	The ecological and evolutionary consequences of systemic racism in urban environments

3.4.3 Implement Training and Policies to Prevent Bias and Discrimination

Due to the passage of the Tennessee Divisive Concepts Act, higher education institutions in Tennessee can no longer require diversity statements in job applications nor require bias training. However, the BGE department has created opportunities for interested faculty to participate in cultural competence sessions

to help individuals understand and respect the perspectives and experiences of others. For example, monthly brown bag lunch sessions serve to facilitate discussion among faculty members on ways to engage with local community members. The department has invited experts from various groups on campus to faculty meetings to learn about the diverse needs of our students (i.e. Center of Women and Gender Studies, Disability Resource Center).

3.4.4 Works in Progress

To date, the BGE department has identified the following tasks for the upcoming years to cultivate a welcoming and inclusive environment:

1. Consider the revision of departmental bylaws to emphasize the importance of collegiality,
2. Coordinate a Black History movie night with Multicultural Affairs and the Africana Studies Program,
3. Organize a seminar series featuring diverse scientists and researchers in areas of biology, geology, and environmental science, and
4. Administer a follow-up climate survey to assess progress.

3.4.5 Diverse Experiences Specific to Biology and Environmental Science

As discussed earlier, Biology and Environmental Science students are given access to diverse learning opportunities. More than 15 upper-level courses in Biology and Environmental Science have field components, including some courses that include field trips. These experiences move learning out of the classroom and into the surrounding communities, giving students the opportunity to experience, first-hand, the diverse organisms and locales of the area. Students are given the opportunity to practice newly learned skills in the natural environment, such as sampling techniques, data collection, and experimental design. In addition to three field stations that focus on the natural heritage of the Ridge and Valley Eco Region of Tennessee, UTC has affiliations with the Gulf Coast Research Laboratory (GCRL) in Ocean Springs, MS and Highlands Biological Station in Highlands, NC. These field stations offer our students experiences that are otherwise not available on the main UTC campus. Several students have taken Marine Biology and Ecology courses at GCRL.

The Environmental Science curriculum includes several courses that expose students to diverse perspectives that may challenge conventional understandings and preferences. In the introductory Environmental Science courses (ESC 1500 and 1510 lecture and lab) students are introduced to the complex interrelationships between environmental, economic, and social issues. Upper-level courses delve into these issues in more depth, including Air and Water Pollution Control (ESC 3600), Environmental Conservation (ESC 4070), Environmental Law and Agencies (ESC 4100), Case Studies in Environmental Problems (ESC 4300), and Values and the Environment (ESC 4840). In several of these courses, students are assigned stakeholder roles in hypothetical and real-world situations and are required to advocate their positions in written and oral form. In Values and the Environment, students are assigned a position on an ethical issue and are expected to debate vigorously either in support of it or in opposition to it. These experiences prepare students to be effective professionals in the environmental arena, by teaching them how to be persuasive and convincing, given that many individuals they will encounter ‘out in the world’ will likely prove to be something other than pro-environment.

The faculty in the department have a wide range of research interests. Students can engage with the faculty in research, enabling them to apply their knowledge in the laboratory or field. Our faculty hold multiple federal, state, and privately funded research grants supporting regional, national, and international projects. Opportunities include faculty research projects in other countries including Chile, England, France, and Finland and remote collaborations with international faculty.

Undergraduate research typically leads students to attend regional and national meetings, where they are given the opportunity to interact with students and faculty from other institutions. Often, our students present their research at meetings, allowing them to interact with graduate faculty and potentially form valuable connections to graduate programs. Travel to regional meetings may also represent the first time that students have left the area that they call home. Being able to travel to new locales and interact with people with different experiences and backgrounds is an important opportunity for our students.

Many students in the Biology and Environmental Science Programs take part in study abroad and domestic exchange opportunities during their time at UTC. ESC students may use study abroad as the Senior Capstone Experience. These programs allow students to continue their studies in another part of the country or world while enabling them to explore the culture of a different region. Study abroad experiences often allow students to study and experience unique areas of biodiversity, such as the rain forests of Costa Rica, the beaches and reefs of San Salvador, or the Great Barrier Reef of Australia. The department works closely with students that plan to study abroad to ensure that they take appropriate classes for their major, and that those courses are properly credited once they are transferred back to UTC.

The Department is also active on social media, namely Facebook and Instagram. In addition to the social media accounts dedicated to the various BGE Clubs, there are three Instagram Accounts managed by three different individuals: Dr. Deanna Beasley is active with the BGE Department Instagram, Dr. Bradley Reynolds maintains the Environmental Science Instagram account, and Dr. Ashley Manning Berg and Dr. Amy Brock-Hon maintain the Geology Instagram. Through social media, the department, the clubs, and the programs can and do expose their followers (a healthy mix of current and former students and alums) to diverse perspectives and experiences. As an example, consider how Dr. Reynolds posts African American scientists and scholars during Black History Month. Also, consider how he consistently highlights female graduates doing amazing things in the field and highlights researchers (like Dr. Loren Hayes and his students in Chile) doing research in faraway places and among diverse cultures. Geology does something similar, as does the BGE Department when they also highlight scientists with diverse backgrounds and experiences.

3.4.6 Diverse Experiences Specific to Geology

Diverse experiential learning opportunities are inherent to the Geology Program with course embedded field trips and labs. Multiple courses offered in the Geology Program require field trips, and 17 require a laboratory component. Field trips in Geology courses range from 2-hour day trips and weekend overnight trips to week-long course trips. Locations visited range from local and regional sites in and around Chattanooga to the desert southwestern US and Scotland. These field trips allow students to observe and examine a diversity of earth materials, structures, rock types and relationships, landscapes, and soils.

- **Field Trip Course:** Since 1993, the Geology Program has offered Geology Field Experience (GEOL 4960) every spring semester that alternately travels to locations in the southwestern United States (odd years) and an international destination (even years until 2018). The course is open to all students who have passed an introductory level geology course. In 2018 and 2023, the course traveled to Scotland. This is a 3-hour course that culminates in a 10-day field trip. Region-specific Geology, taught by traditional lectures, is followed by student-led discussions of specific field trip topics. Highlights of the Scotland trips have included visits to Hutton's unconformities and key sites related to the history of geology, sedimentary, metamorphic and igneous rocks and important, major geologic structures that relate Scotland to eastern North America.
- **Senior Seminar Projects:** In their capstone courses, Geology students conduct 1-semester research projects of their own formulation and design. In this course, students apply concepts learned throughout their coursework at UTC. A select list of Senior Research Project titles includes:

- Correlating Specific Yield and Porosity to Soils Exposed During the Rough Ridge Wildfires.
- XRD Analysis of Potential Paleosol from Gray Fossil Site, TN.
- Evidence for Lichen-Induced Substrate Biodegradation of the Monteagle Limestone at Little Cedar Mountain, TN: Mechanisms and Products at the Lichen-Rock Interface.
- Acid Mine Drainage from Hogskin Branch Mine, TN and its Effect on Stream water pH.
- The Search for Microfossils in the Walden Creek Group, Ocoee Supergroup, Using the Liquid Nitrogen (LN₂) Method for Chattanooga Rock Disintegration.
- Characterization of Outcrop at Woodstock, Georgia and Possible Melange Interpretation.
- Assessing the morphology of soils found at Soddy Creek Wildlife Management Area.
- Exploring Landslide Susceptibility in Hamilton County, Tennessee using GIS.
- Spatio-Temporal Analysis of Snowpack in the Colorado River Watershed Using GIS
- The Effects of a Disturbed Coal Seam on Water Chemistry in Rock Creek, Soddy Daisy, Tennessee
- Application of Geospatial Technology to Map Sub-bottom Sonar 2D data in the Apalachee Bay, FL
- Microplastics in a Small Stream: Storm Response in a Tributary to the Tennessee River
- Application of Remote Sensing to Study the Potential Impact of 2020 Wildfire Events on the Glaciers of Mount Baker, Washington
- Remote Sensing Terrain Destruction of Fernandina Island's La Cumbre Volcano
- A comparison between lead-bearing and lead-free soils in Southside Chattanooga
- Analysis of water samples and speleothem inside Raccoon Mountain Caverns.
- Student Research with Faculty: Students often have the opportunity to work with faculty on diverse geologic problems from outside the Chattanooga area. For example, in the Geology Program, Dr. Brock-Hon investigates soils from arid regions. Students have worked with her using samples from Nevada, western Kansas, Arizona, Texas, and New Mexico. In 2024, one student was funded to travel with Dr. Brock-Hon to help complete a geologic map in her field area in Nevada. She has also had multiple students' help with her research studying unique depressions across the Cumberland Plateau. Dr. Hossain worked with students in his research to quantify estimation of sediments in surface water of the Tennessee River and integrate remote sensing with hydrodynamic models to investigate sediment transport in the Tennessee River Basin. Dr. DeVries incorporated students in her microplastic research. Dr. Manning-Berg works with students on several sedimentological projects ranging from the investigation into the silicification of stromatolites in the Knox Group, in NW Georgia, silicification of microbial mats from the Angmaat Formation, Baffin Island Canada, and the silicification process and its effects on preservation. She also includes students in research that involves describing or re-interpreting carbonate formations and geochemistry at Raccoon Mountain Caverns and analyzing the water chemistry and water-rock interaction within the cave. Her students are also involved in identifying and quantifying microplastics in local streams and working to improve sampling techniques for microplastics in these streams. She also has a student comparing the concentration of microplastics in cave sediments along multiple tour routes within Raccoon Mountain Caverns to highlight the introduction of microplastic pollution into cave environments.

3.5 Student Access to Appropriate Academic Support Services

Academic support services are critical to student success. Students in the Department of Biology, Geology, and Environmental Science can access a wide range of services focused on student success. Services available to students include academic advising, tutoring and supplemental instruction, personal and career counseling, and career and employment services.

3.5.1 Biology and Environmental Science Advising

Academic advising helps students navigate the curriculum and ensures they make progress towards degree completion. The large number of Biology and Environmental Science majors (over 800) requires several advising mechanisms. First-year students are paired with an advisor in the UTC Center for Academic Support and Advisement (CASA), who helps with course selection and major exploration. With 28 coursework hours completed, students move to College of Arts and Sciences Advising Hub. Biology students are advised by Rachel Weibel and Environmental Science students are advised by Joseph McCauley. The faculty serve as career mentors and students can select any faculty whose interests align. The CAS Hub academic advisors and department faculty are available for advising throughout the semester by appointment. Academic advising prior to course registration is required, as advising holds must be removed for students to register. Advising appointments also allow students to discuss their future academic and career goals with their advisor. Students receive guidance about application processes for graduate and professional programs and information about careers in their field and the skills needed to be successful in those careers. UTC also employs a Pre-Health Professions Assistant Director who provides supplemental advising in areas such as pre-medicine, pre-dental, pre-vet, pre-pharmacy, pre-physician assistant, etc. Advisors utilize the program Navigate to contact students, launch advising campaigns, track student success, and capture meeting notes. It allows all interactions with students to be consulted by any advisor or faculty member.

3.5.2 Geology Advising

First-year Geology students are paired with an advisor in the UTC Center for Academic Support and Advisement (CASA) who helps with course selection and major exploration. Due to the small number of students, Geology majors beyond the first year are advised by Geology faculty. This gives the Geology faculty more opportunities to make connections with students to help with retention. The current advising scheme is based on the degree concentration of the major. For example, those interested in the Geospatial concentration are advised by Dr. Hossain. Other, more general concentrations are split evenly among the Geology faculty. CASA has been asked to encourage freshmen Geology majors to see their Geology advisors during their first year. At advising sessions, students are informed about the course offering schedule and assisted with developing their program plan. Prior to registration for the next semester, advising holds are released by faculty. Geology faculty are also available outside of scheduled advising times throughout the semester.

3.5.3 Additional Academic Support Services

The Center for Academic Support and Advisement (CASA) supports all university students in tutoring, supplemental instruction, time management programs, study skills programs, and strategies to prepare for exams. All these services are provided free to all students enrolled at the university.

Free one-hour tutoring sessions are available for the courses shown in Table 3.3. Students must make appointments through Navigate at least 24 hours in advance. Students applying as peer tutors must be upperclassmen with a minimum 3.0 GPA and must have earned at least a B in the subject that they plan to tutor. Between Fall 2018 and Fall 2023, 4,457 attendees made 3,362 appointments for tutoring. The

Center does not record the student's major or department when they attend tutoring, though many of the classes for which tutoring is offered are required of our majors.

Table 3.3 Courses with Peer Tutoring

Discipline	Course Numbers
Biology	1110, 1120, 2060, 2080,
Chemistry	1110, 1120, 3010, 3020, 4510
Economics	1010, 1020
Engineering	1030
Mathematics	1010, 1130, 1730, 1830, 1950, 2100,

Supplemental Instruction (SI) is another resource students can use to improve their academic performance in certain introductory courses. SI is provided free of charge through the CASA. SI leaders are upperclassmen with an overall GPA of 3.0 and have completed the course that they plan to lead with an A or B grade. SI sessions provide an opportunity for students to review their notes, discuss class readings, and develop strategies for upcoming exams. SI leaders attend the same class meetings, take notes, and review those materials with students in the session. SI is available for various classes and offerings vary by student availability. For Fall 2023, courses that assigned SI Instructors taken by BGE majors include BIOL 1110, 1120, 1130, 2060, and 3250, and CHEM 1110, 3010, and 3020. Since Fall 2018, attendance at Biology SI sessions has been 1,507 (range: 31 in summer 2019, 232 in Fall 2019). Ten of our Functional Human Anatomy and Human Physiology students have served as SI leaders. These students are tasked with leading three-hour tutoring sessions for an individual section of either Functional Human Anatomy or Human Physiology.

Geology offers free tutoring through the Earth Center. Faculty and students (who have earned grades of B or better in introductory geology courses) volunteer an hour a week to be available to students with questions.

The UTC Center for Wellbeing supports the personal and academic growth of our students by cultivating a well and safe campus community. The center encourages life-long wellbeing by promoting healthy coping skills, a culture of care, risk reduction and wellness. Focus areas include mental health awareness, suicide prevention, substance abuse education, sexual assault, dating violence and stalking prevention, support for students in recovery, and physical health, sexual health and nutrition.

The Counseling Center is available to university students for a wide range of services. The Center provides free counseling to students who need help with anxiety, depression, adjustment issues, relationship problems, substance abuse, crisis intervention, trauma, and academic concerns. Intake meetings with staff are available by appointment or on a walk-in basis. The center provides individual and group sessions to provide the help that students need with their issues. These sessions focus on helping the student gain the skills and abilities needed to better cope with the issues they might be facing. The Center also provides crisis services to assist students with traumatic events, thoughts of suicide, thoughts of harming others, and psychotic episodes. The Center also provides psychiatric support, including referrals for psychiatric services and medications, and medication management. Through the center, students have access to free mental health apps such as Sanvello and What's Up. The UTC Counseling Center occasionally partners with local organizations to bring Emotional Support Animals to campus for special events.

The Disability Resource Center (DRC) provides access and accommodations for students with documented disabilities across all courses and majors. Accommodations ensure that students with disabilities have the same level of access to the courses they are taking. The DRC provides a range of

services, including assistive technology and classroom, exam, and housing accommodations. Students can make a request for services at any time during the academic year. The DRC also directs the MOSAIC program, which is designed to aid and support students with autism spectrum disorders.

The Center for Leadership and Career Development provides UTC students and alumni with the confidence and skills to find their purpose, thrive in their career, and contribute to their communities. They offer programs such as ‘What can I do with my major?’ and job search engines such as ‘Handshake’ for alumni and students. The Career Development Alliance is a community of members from across UTC with a vested interest or connection to career services at UTC. The Alliance connects these members to work as resources for each other, sharing ideas, best practices and working to develop better career services for all UTC students. Finally, they hold events for career success, such as ‘Tips for a successful career.’

3.6 Department Narrative, Strengths, Weaknesses, and Recommendations for Improvement

3.6.1 Biology and Environmental Science

3.6.1.1 *BES Strengths*

We offer a diversity of courses, many with field trips and research opportunities, to our students. Students are exposed to professional and career opportunities through research participation, seminars, professional meetings, and through interaction with faculty, advisors, and campus resources, such as the Center for Leadership and Career Development. The university recently hired a Pre-Health Advisor to serve as the campus-wide resource for students seeking admission to professional programs in medical and allied health fields. The department is also working with entities in the community to increase opportunities for student internships, job shadowing experiences, and job placement. Undergraduate research is a major draw for students in our department. The faculty's dedication and willingness to offer these opportunities speaks to their importance. Several of our faculty have federal, state, or private funding to support student research. Biology and Environmental Science students have opportunities to regularly evaluate the curricula and faculty teaching effectiveness. Students are also given the opportunity to provide their overall thoughts on the programs. Surveys are conducted at the department and university levels to get feedback from our students about the programs and the faculty. Faculty and administration use results from various surveys to make meaningful changes to meet the needs of our students.

3.6.1.2 *BES Weaknesses*

Due to the large number of majors in our department, it is difficult to foster close relationships and provide personalized opportunities for many of our students. For example, the number of faculty, space, and resources have not kept pace with the increase in student enrollment, so the number of students that can be involved in research is limited. While the recent renovation of Holt improved some teaching and research spaces, it did not dramatically improve research and experiential learning opportunities for our students. Many existing Biology and Environmental Science lab courses include an experiential component, such as conducting research and presenting findings to the UTC community and at scientific conferences. Student participation in the evaluation process is typically low. As a department, we need to better communicate the value of evaluation processes to our students.

3.6.1.3 *BES Recommendations for Improvement*

Biology and Environmental Science faculty are dedicated to serving our students. However, without resources and a modern facility, we will remain limited in our capacity to provide cutting-edge research opportunities to our students. Thus, we need to advocate for more resources from the administration and time for BGE faculty to seek funding for their research programs. New hires should be given load reductions to allow them time to write grants and build a research portfolio through publications and conference presentations. In terms of teaching, we need to continue evaluating the accessibility of our

courses to students and work with advisors to better prepare students for the clear path to graduation. Finally, we need to continue building student-faculty relationships and promoting student participation in all facets of the department (e.g., courses, research, evaluation processes).

3.6.2 Geology

3.6.2.1 Geology Strengths

Geology students benefit from small classes with dedicated faculty. The Division is committed to educating their students for success in their future careers. Because of the group's size, geology faculty can meet and discuss curricular issues, converse about challenges faced by students, and find quick and efficient ways to resolve issues when needed. The group works and communicates well together. This was recently demonstrated by a full curriculum revision that took place over the past several semesters. Additionally, since Geology faculty advise geology majors, faculty are very aware and in-tune with the progress of students and any barriers in the curriculum. Through the advising process, Geology faculty can quickly respond to issues as they see them arise. Geology students benefit from this collegiality in updated curriculum, and the ability to converse with a broad range of faculty that are easily accessible. Geology students are provided with professional and career opportunities through involvement in student clubs, engagement in research opportunities and as part of course field trips to professional labs, and participation in professional organizations.

3.6.2.2 Geology Weaknesses

Students in the Geology Program can communicate their thoughts on the curriculum and program, teaching effectiveness, overall program experience through surveys at the department through university levels. Geology faculty work to meet the needs of students by reflecting on student survey data. However, student participation in these surveys is low. Also, determining student opinion of the Geology Program is complicated due to overwhelming numbers of Biology and Environmental Science student data included in the survey results. Dividing student responses by program would be more helpful in determining weaknesses and strengths at the program level.

3.6.2.3 Geology Recommendations for Improvement

While student involvement in Geology clubs varies by semester, the program can do more to motivate students to become active members. The program can also endeavor to bring at least one professional speaker to campus each semester to talk with students about working as a Geology professional.

4 Faculty

4.1 Faculty Credentials and Quality of Teaching

The UTC Faculty Handbook, the CAS Bylaws and the BGE Bylaws govern our faculty. These documents can be found in [Appendix 4-A](#), [Appendix 4-B](#), and [Appendix 4-C](#) respectively.

4.1.1 Full-time Faculty Credentials

In Fall 2023, the department has 35 full-time faculty members. There are two additional tenured faculty members with full-time administrative appointments and a faculty member with dual appointment in Computer Science, all who have limited teaching responsibilities in BGE. In addition, the BGE Department Head is a tenured faculty member from another discipline (Chemistry). A detailed breakdown of the 35 full-time faculty is as follows:

- 21 Tenure Track (TT): 18 BES and 4 Geology
- 11 Non-tenure Track (NTT): 9 BES and 2 Geology
- 3 Non-Tenure Track Who are Visiting Faculty: all BES

Twenty-nine of the full-time faculty are in the Divisions of Biology and Environmental Science and six of the full-time faculty are in the Division of Geology. Several of the NTT faculty also serve additional roles as lab coordinators, including the Anatomy/Physiology Lab Coordinator, the Microbiology Prep Lab Coordinator, and the Introductory Biology Lab Coordinator. Among the full-time faculty, 26 possess terminal academic degrees, including 24 PhD's, one EdD, and one JD/LLM. Current full-time faculty credentials are in [Appendix 4-D](#). Credentials for administrators with tenure in BGE are listed in [Appendix 4-E](#). Credentials for full-time faculty who have left the department (retired, resigned, passed away) during the self-study are shared in [Appendix 4-F](#). The educational backgrounds of our faculty represent a broad spectrum, with graduate degrees deriving from institutions across the country and the world.

The Department is in a transitional faculty phase due to the loss of a faculty member to death and two faculty resignations. These were all tenure track faculty. Two of these lines have been temporarily filled with visiting NTT faculty. Two of the open lines are under active searches (Assistant Professor of Applied Freshwater Fish Biology and Assistant Professor of Hydrogeology). The third position was vacated in Summer 2023, and the Department Hiring and Planning Committee is evaluating research and teaching trends to recommend the replacement focus area.

In Summer 2023, Dr. Cheryl Murphy, who served as the Faculty Associate/Introductory Biology Lab Coordinator, left the department to work as the UTC Director of Research Integrity. The position vacancy allowed it to be evaluated and split into two positions. The Faculty Associate was filled with a 12-month staff member who handles ordering, safety, equipment, and space. The Introductory Biology Lab Coordinator position was converted to a NTT faculty line. This happened in July 2023 and due to the short time to the start of the semester, it was filled with a Visiting Lecturer.

The research and teaching interests of our faculty are diverse, allowing the department to serve a wide range of student programs of study in Biology, Geology, and Environmental Science. A detail of faculty expertise can be found in Table 4.1 and includes:

- Conservation and restoration ecology,
- Ecology, evolution, and behavior,

- Environment and human health,
- Environmental and natural resource law and policy,
- Geographic Information Systems (GIS),
- Human impacts on insect physiology and behavior,
- Microbiology,
- Molecular and cellular biology,
- Organismal biology, and
- Systematics and biodiversity

Table 4.1 Broad areas of expertise among current BGE full-time faculty.

Area of Expertise	NTT Faculty	TT Faculty
Conservation and Restoration Ecology	Reynolds	Aborn, J. Barbosa, Boyd, Craddock, Gaudin, Shaw, Tucker, Wilson
Ecology, Evolution, and Behavior	Caskey, Chapman, Feely, Miles	Aborn, Beasley, Boyd, Chatzimanolis, Craddock, Gaudin, Hayes, Klug, Leasi, Shaw, Wilson
Environmental and Human Health	Adams, Farnsley, Sharma	Giles, Hossain, Leasi, Richards, Spratt, Tucker, Wilson
Environmental & Natural Resources Law, Land Use Planning and Regulation		Richards, Tucker, Wilson
Geology	Bramblett, Ludwig, Shirmeen	Brock-Hon, Gaudin, Hossain, Manning-Berg, Taylor
Geospatial Services	Shirmeen	Hossain, Wilson
Microbiology	N. Barbosa	Giles, Spratt
Molecular Biology and Cell Physiology	Sharma	J. Barbosa, Ferdoush, Giles, Leasi, Spratt
Organismal Biology	Bramblett, Caskey, Chapman, Jarvis, Kinnear	Aborn, J. Barbosa, Boyd, Chatzimanolis, Craddock, Gaudin, Hayes, Klug, Leasi, Shaw, Spratt, Wilson
Systematics and Biodiversity	Bramblett, Caskey	Chatzimanolis, Craddock, Gaudin, Leasi, Shaw, Wilson

We have four faculty members working primarily in Environmental Sciences, including the areas of toxicology, environmental law and policy, human impacts on insect physiology and behavior, and Geographic Information Systems, and many other faculty's research and teaching crosses over into both Biology and Environmental Science. One of our faculty members regularly teaches courses in biostatistics. Three of our faculty members are microbiologists, one faculty member is a developmental biologist, and two have expertise in paleontology. We have four botanists with interests in floristics, Chestnut tree restoration, plant ecology, plant physiology, and higher plant systematics. We have seven faculty members that study animal systems, including insects, amphibians and reptiles, birds, fish, and mammals. We have three faculty members with interests in behavioral ecology. Several members of our faculty are knowledgeable about molecular biology and proficient in employing molecular techniques in their research. Specifically, four of our faculty members employ molecular tools such as: PCR and DNA sequencing to address questions of evolution and biogeography in plants; conservation genetics to facilitate restoration ecology; the identification and functional characterization of genes to determine their influences on nuclear functions such as DNA replication, chromosome segregation and gene expression; and integrating the study of molecular Biology with histological techniques and developmental questions.

In the Geology Division, tenured/tenure-track faculty research and teaching emphases cover the areas of Geology including mineralogy, sedimentology, petrology, structural geology, geomorphology, geobiology, and environmental geology with applications to local, regional, national, and global problems. Faculty research at the local and regional levels focus on the geomorphic development and genesis of landforms across the Cumberland Plateau, the preservation of microbes in silicious rocks of the region, and monitoring of surface water quality via GIS and remote sensing. In addition to local and regional interests, faculty study arid soil-geomorphology of landforms developed in the southwestern USA. Extraordinary field trips to the Spanish Pyrenees, and Scotland extend our teaching and learning, and research interests to include these areas along with trips to the Desert Southwestern US. Above all else, the faculty in Geology emphasize collaborative research with students in broad areas of geoscience.

BGE faculty members, both NTT and TT, collaborate with local, national, and international partners, providing students with a broad range of projects, educational opportunities, and networking. Local collaborations include organizations such as the Tennessee Aquarium, Erlanger Hospital, Reflection Riding Arboretum and Nature Center, Chattanooga Zoo, Tennessee River Gorge Trust, City of Chattanooga, Electric Power Board, Raccoon Mountain Caverns, and North Chickamauga Creek Conservancy. Our faculty members collaborate with researchers at a wide range of universities in Tennessee and other states. Several BGE faculty members have international collaborations, including collaborations in Argentina, Australia, Canada, Chile, England, France, Germany, Italy, and Switzerland. BGE faculty members have given seminars and conference presentations, participated in workshops, and served on PhD committees in numerous countries.

NTT faculty serve critical roles as lab coordinators in all divisions. NTT faculty also teach large sections of service courses and introductory courses in Biology, Geology, and Environmental Science. They design and teach upper-level classes that fit their educational expertise. Several of the NTT faculty also mentor students through individual studies, internships, and field research.

All faculty participate in departmental and university governance and in departmental, college, and university service activities. New since our last self-study, the College of Arts and Sciences Advising Center (Hub) was created that provides two advisors to conduct academic advising for Biology and Environmental Science students. BES faculty serve primarily as career advisors for students, although many continue to provide some academic advising. Due to the small volume of Geology majors, the Geology faculty serve as both academic and career advisors to students.

4.1.2 Part-Time Faculty Credentials

Twenty part-time faculty members have taught courses for the Department over the past five years. Seventeen of the part-time faculty taught in the Division of Biology and Environmental Science and three taught in the Division of Geology. Among the BES part-time faculty, were three graduate students with 18 hours completed in the discipline. They were supervised by the Faculty Associate while they were listed as secondary instructors. Among the part-time faculty (not including graduate students), five possess a PhD and 12 possess a MS degree. These part-time faculty play a critical role in sustaining high-demand course offerings for introductory, general education courses such as Principles of Biology, Introduction to Environmental Science I, Conservation of Biodiversity, Geology of the National Parks, and Physical Geology. Meeting the enrollment demand aids in the timely graduation of our BGE students as well as other majors across campus. Part-time faculty also serve to alleviate student credit hour production for our full-time faculty, which allows those faculty to advance the Biology, Geology, and Environmental Sciences programs through faculty development, research, career advisement, and new course development. [Appendix 4-G](#) has a listing of the part-time faculty, their credentials and the specific courses taught during the time of the self-study.

4.1.3 Faculty credentials and courses in which they teach

4.1.3.1 Biology

In the Division of Biology, our faculty are well prepared to teach general education courses, core course offerings (introductory biology, genetics, ecology, and evolution), and offer a wide range of upper division courses in our undergraduate curriculum.

- *General Education and Introductory Biology:* These included Life on Earth (BIOL 1050/L) Conservation and Biodiversity (BIOL 1100), and Microbiology and Health (BIOL 2100/L). These are taught by full-time faculty as well as adjuncts. Both BIOL 1050/L and BIOL 1100 are offered online. We offer three introductory Biology courses, BIOL 1110/L, BIOL 1120/L, and BIOL 1130 (lecture, only). Introductory Biology lectures are generally taught by lecturers and tenure-track faculty. Laboratory sections are coordinated by our lab coordinator. The position is currently filled by a visiting lecturer. Lab sections are typically taught by graduate assistants or full-time faculty.
- *Core courses:* Ecology (BIOL 3060) is taught by faculty members with ecology backgrounds including Aborn, Beasley, Boyd, Caskey, Hayes, Miles, and Wilson. Genetics (BIOL 3250) is taught by faculty with backgrounds in genetics including Barbosa, Carver, Ferdoush, and Leasi. Evolution (BIOL 3350) is taught by faculty with evolutionary backgrounds including Chatzimanolis, Beasley, Gaudin, Leasi, Klug, and Miles.
- *Elective courses:* The diverse backgrounds of our full-time tenure-track, non-tenure-track, and adjunct faculty allow for a diverse offering of elective Biology courses. Some examples include animal behavior, animal physiology, behavioral ecology, biogeography, cell biology, comparative vertebrate zoology, Deje flu, development vertebrate embryology, dendrology, ecology and management of GSMNP, entomology, global change biology, human development and disease, immunology, invertebrate zoology, limnology and reservoir ecology, marine ecology, microbial ecology, mycology, parasitology, plant morphology, plant physiology, pollinator biology, principles of microbiology, urban gardening, virology, and wildlife education and rehabilitation.

4.1.3.2 Environmental Science

In the Division of Environmental Sciences, our faculty are well prepared to teach general education course offerings, core courses (including Introduction to Environmental Science I and II), and offer a wide range of upper division courses in our undergraduate curriculum.

- *General Education and Introductory Environmental Science:* Conservation and Biodiversity (ESC 1100) and Introduction to Environmental Science I and II (ESC 1500/L and 1510L) are general education science courses. These are taught by full-time faculty as well as adjuncts. ESC 1100 is offered online. Labs are taught by full-time faculty, graduate teaching assistants, and adjunct faculty.
- *Core Courses:* Introductory GIS and Remote Sensing (GEOL 2100) is taught by geology faculty. Full-time ESC faculty teach ESC 2500 (World Resources). Ecology (BIOL 3060) is taught by faculty members with ecology backgrounds (Aborn, Beasley, Boyd, Caskey, Hayes, Miles, and Wilson). Genetics (BIOL 3250) is taught by faculty with backgrounds in genetics including Barbosa, Carver, Ferdoush, and Leasi. Evolution (BIOL 3350) is taught by faculty with evolutionary backgrounds including Chatzimanolis, Beasley, Gaudin, Leasi, Klug, and Miles. Environmental Law and Agencies (ESC 4100) is taught by environmental law specialist Tucker. Values and the Environment (ESC 4840) is taught by Reynolds in the spring and by Dr. Lucy Schultz (Philosophy and Religion) in fall semester.
- *Methods and Upper-Division Required Courses:* Environmental Survey Methods (ESC 3400), Air and Water Pollution Control (ESC 3600), and Limnology and Reservoir Ecology (ESC 4520), are taught by Wilson, Richards, and Chapman, respectively.

- *Senior Experience:* Environmental Science majors must also complete two hours of Senior Experience, which can be satisfied through a variety of seminar, internship, and research course options.
- *Elective courses:* The diverse backgrounds of our tenure-track, non-tenure-track and adjunct faculty allow for a diverse offering of elective Environmental Science courses. Most of the courses are cross listed with Biology. Some examples include environmental survey methods, global change biology, limnology and reservoir ecology, microbial ecology, and remote sensing and imagery analysis.

4.1.3.3 Geology

In the Division of Geology, our faculty are well prepared to teach general education course offerings (e.g. Physical Geology, Historical Geology, Geology of the National Parks, Natural Hazards) as well as a wide range of upper division core courses and electives in our undergraduate curriculum. Three of our faculty hold graduate faculty status and may teach graduate courses and sit on graduate committees.

- *General Education and Introductory Geology:* Full-time faculty (including a laboratory specialist) and adjuncts offer introductory courses in Geology, including Physical Geology (GEOL 1110/L) and Historical Geology (GEOL 1120/L). We also offer a diverse set of general education courses developed to recruit new majors. These include Geology of National Parks (GEOL 1025), Natural Hazards (GEOL 1030), Earth's Resources and the Environment (1105), Global Climate Change (GEOL 2200) and Oceanography (GEOL 2250). These are taught by both full-time faculty and adjuncts. A new lab, Earth and the Environment Lab (GEOL 1105L), can be paired with several of the courses to prepare students as geology majors. This new lab is taught by the lab specialist, a full-time faculty member.
- *Core Courses:* The diverse backgrounds of our full-time tenured and tenure-track faculty allow for course offerings designed to provide students with quality instruction. Core courses required by various tracks in our major include Introductory GIS and Remote Sensing (GEOL 2100), Mineralogy (GEOL 3410), Sedimentary Rocks and Stratigraphy (GEOL 3540), Earth Surface Process (GEOL 4080), and Structural Geology (GEOL 4510). These are taught by full-time faculty who have expertise in each area.
- *Capstone Research:* Research Design (GEOL 4800) and Senior Research Project (GEOL 4900), Paleontology and Field Methods in Structural Geology (both required of BS Geology: Geology major), and Hydrology and Environmental Geology (both required of the BS Geology: Environmental Geology major) are all considered capstone research courses.
- *Concentration Requirements and Elective Courses:* Each track has courses that define the concentration and elective hours to be fulfilled. Courses in these areas include Geology of Tennessee (GEOL 3070), Soil Properties, Genesis, and Development Across the Landscape (GEOL 3220), Environmental Geology (GEOL 3230), Hydrology (GEOL 4450), Petrology (GEOL 3420), The Dynamic Earth (GEOL 4070), Applied Environmental Geochemistry (GEOL 4470), Field Methods in Structural Geology (GEOL 4520), GIS for Geoscientists (GEOL 4530), Remote Sensing for Geoscientists (GEOL 4550), and Hydrogeologic Modeling (GEOL 4490). Full-time faculty teach all of these courses. An adjunct professor has only been hired when in search of a replacement for a full-time faculty member.

4.1.4 Quality of Teaching

While the BGE Department has high academic standards, students evaluate our courses very favorably. Courses (and faculty) at the university are evaluated by students in each class they teach during the academic year on the following evaluation items. Table 4.2 contains the questions for the course learning evaluations that address quality of teaching.

Table 4.2 Course Learning Evaluation Questions that Address Quality of Teaching

Focus Area	Questions
Course Learning Outcomes	Q1: I have read and understand the course learning outcomes in the syllabus and/or in Canvas. Q2: The course content addresses the course learning outcomes. Q3: The course structure (organization helps me in achieve the course learning outcomes. Q4: I believe that I am achieving the course learning outcomes.
Course Content and Delivery	Q5: The course encourages my use of critical thinking skills. Q6: The way this course is delivered encourages me to be actively engaged.
Student Contributions to Learning	Q7: I keep up with all assigned readings in the course.
Course Instruction	Q8: The instructor assists students with achieving the course learning outcomes. Q9: The instructor provides constructive feedback on graded coursework. Q10: The instructor responds to questions and emails within the time frame stated in the syllabus.

Table 4.3 compares the disciplinary data from the course learning evaluations with that of the College of Arts and Science and the University. Sample data of student rating of faculty in all BGE courses from fall 2018 to spring 2023 show that for all evaluation items, student ratings of BGE faculty are within 3.6% of the average College and University-wide ratings. Based on a seven-point scale (1=Strongly Disagree, 2=Disagree, 3=Somewhat Disagree, 4= Neither Agree nor Disagree, 5= Somewhat Agree, 6=Agree, 7=Strongly Agree), more than half of all BGE students surveyed gave faculty the highest rating (7=Strongly Agree). The mean score of BGE faculty is 6.00 or greater for all evaluation items, with the exception of questions:

- The course structure (organization) assists me in achieving the learning outcomes of this course. (mean score 5.98)
- I believe I am achieving the learning outcomes of this course. (mean score 5.98)
- The way this course is delivered encourages me to be actively engaged. (mean score 5.89)
- The instructor provides constructive feedback on my coursework. (mean score 5.77)

As indicated by student evaluations, the BGE Department has a reputation for exceptional teaching that both upholds academic rigor and fosters student success. Across all semesters sampled, the highest scored item for the department is “I am aware (read and understand) of the learning outcomes of this course, as stated in the syllabus and/or in Canvas”, which is 0.9% lower than the College and University-wide mean scores. The BGE faculty are also dedicated to student success, as demonstrated by the department’s second-highest scored item of “The course content addresses the learning outcomes of the course”, which is 1.4% lower than the College and University-wide ratings. The lowest overall rating for departmental faculty is the inclusion of activities and assignments that help students learn course content, which is “The instructor provides constructive feedback on my coursework” and is 6.2% lower than the College and University-wide ratings. One challenge faced by the department is meeting the demands of student enrollment, particularly in introductory courses. To accommodate enrollment, most introductory courses are quite large (60 - 120 students per lecture), which necessitates a limited number of activities and

assignments and could account for the lower, albeit still favorable, mean score for this item. Overall, the quality of BGE instruction is consistent across the Biology, Geology, and Environmental Science programs, is well regarded by students (mean score of 6.21), and is continuously developed through the annual evaluation and development by objectives (EDO) process in which every faculty member reviews course learning evaluations and works to adjust his or her teaching methods accordingly (see **Section 4.4**).

Table 4.3 Mean score of student responses to seven faculty evaluation items for semesters Fall 2018 to Spring 2023. (Score: 0= lowest; 7= highest)

Question	BIOL	GEOL	ESC	BGE	CAS	UTC
Q1: I have read and understand the course learning outcomes in the syllabus and/or in Canvas.	6.52	6.64	6.53	6.53	6.56	6.59
Q2: The course content addresses the course learning outcomes.	6.43	6.63	6.37	6.44	6.51	6.53
Q3: The course structure (organization helps me in achieve the course learning outcomes.	5.92	5.79	6.04	5.398	6.22	6.26
Q4: I believe that I am achieve the course learning outcomes.	5.93	6.39	5.97	5.99	6.21	6.29
Q5: The course encourages my use of critical thinking skills.	6.24	6.38	6.02	6.22	6.35	6.38
Q6: The way this course is delivered encourages me to be actively engaged	5.86	6.25	5.83	5.89	6.07	6.13
Q7: I keep up with all assigned readings in the course.	6.39	6.50	6.45	6.41	6.38	6.42
Q8: The instructor assists students with achieving the course learning outcomes.	6.16	6.47	6.16	6.2	6.33	6.39
Q9: The instructor provides constructive feedback on graded coursework.	5.70	6.19	5.79	5.77	6.07	6.15
Q10: The instructor responds to questions and emails within the time frame stated in the syllabus.	6.05	6.39	6.14	6.1	6.27	6.35

4.2 Faculty Number, Workload Expectations, and Teaching Needs

4.2.1 Faculty Number

The department includes 35 full-time faculty. There are three additional tenured faculty who have administrative appointments and teach on a limited basis. Of the 35 full-time teaching faculty in BGE, 18 are tenured, four are tenure-track, and 14 are non-tenure track faculty. Our NTT faculty number includes nine lecturers, one visiting biology lecturer, one visiting biology assistant professor, one visiting biology lab coordinator, and one geology lab teaching specialist. There are part-time faculty affiliated with BGE who teach courses on a semesterly contract basis. In addition to the current faculty, seven additional full-time TT faculty members taught courses in BGE during the reporting period (i.e., in the past five years).

These include four tenured faculty members who retired, two tenure-track faculty members who left for positions at other institutions, and one faculty member who passed away.

4.2.2 Faculty Workload Expectations

Chapter 3 of the UTC Faculty Handbook establishes general criteria and expectations for faculty performance in three broad areas: Instructional and Advisement Activities, Research, Scholarly, and Creative Activities, and Professional Service Activities. Section 2.10 of the UTC Faculty Handbook states that faculty course loads should be consistent with UTC and departmental policies. Advising and counseling students is part of the teaching obligation. Although the UTC Faculty Handbook does not include a specific workload policy, a campus workload policy is currently under development by Academic Affairs. At the time of our last self-study, the college had a working document related to workload, however, this document is no longer in place.

Regarding teaching, research, and service expectations, the BGE Bylaws provide guidance for both tenure and promotion for TT faculty and promotion of NTT faculty. These guidelines are also used in the annual EDO process.

4.2.2.1. *Teaching workload guidance and expectations*

The UTC Faculty Handbook states that course loads should be consistent with UTC and departmental policies, and that mentoring students is considered to be an integral part of the teaching obligation. Historically, advising students was a major responsibility of BGE faculty but with the creation of a college-wide advising center (the Hub), faculty responsibility has shifted away from traditional advising and more towards professional and career mentoring. The current strategy recognizes that teaching efforts may vary among tenured and tenure-track and even non-tenure track faculty within each department and that teaching responsibilities may change over time for individual faculty as their contributions to research, scholarship, creative activity, and service vary. As such, differential work assignments may be assigned that take into account factors including external funding that serves the mission of the university and requires active administrative or scholarly involvement; administrative duties at the department, college, or university level that are beyond those typically expected of faculty; a high level of research, scholarship, and/or creative activity; active supervision of theses and student-led research/creative activity that may be considered an intensive form of non-classroom teaching; instruction in a variety of courses that requires unusual preparation time; laboratory and/or program coordination duties; and/or instruction of large classes without grading (or other) assistance. The Department Head must notify or otherwise consult with the Dean of the college to ensure that resources are available to cover what may result in additional instructional costs associated with variable work assignments that involve reduced teaching loads.

In BGE, the departmental teaching workload model largely follows historical precedent by allowing for reasonable ranges of faculty effort while still offering a robust course schedule as determined by the Department Head. Load is typically assigned as follows:

- TT Faculty: Three course preps - an example would be a core lecture course of 48 and an upper-level lecture/lab combination of 24 students, another example would be a lecture of 48 students and two associated labs of 24 students. More explanation of this can be found in 4.3.3.
- NTT Faculty: 12 contact hours - an example would be a double lecture of 120 students, a single lecture of 60 students and a lab of 24 students.

NTT faculty consistently teach more than 12 contact hours and are compensated at an additional rate of \$1,000 per contact hour over 12. We could not serve our majors and other students on campus without this extra service from the NTT faculty. For TT faculty, the BGE Bylaws detail that teaching loads of more than three preps, 10 contact hours, would be considered as having a greater than average teaching load. The BGE Bylaws acknowledge the diverse strengths of its faculty and the varied needs of its

programs and thus recognize that faculty in BGE will differ in their work assignments and the relative amount of professional effort devoted to teaching, research, and service.

Per the BGE Bylaws, the minimum teaching and advising expectations for TT tenure and promotion include the following:

Teaching, Advising, and Mentoring – In BGE, evidence of having “achieved a reputation as an accomplished teacher” means the candidate must become an effective teacher at UTC. BGE considers faculty performance in the classroom, student advising, and research mentoring in the evaluation of teaching performance.

Teaching – A faculty member, at a minimum, must meet the following teaching requirements to be considered for tenure and/or promotion:

- (i) Student evaluation results with median scores of 5.0 or greater for all Course Content and Delivery and Course Instruction questions (scale of 0-7 with 7 being best) on average during the three (3) years prior to tenure consideration.
- (ii) A majority of peer evaluation ratings of “very good” or “excellent” during the last two semesters of peer evaluations.
- (iii) Evidence of responding positively to reasonable criticisms offered through student and peer evaluations, by showing a willingness to change and improve.

To demonstrate excellence in teaching, a candidate for tenure and/or promotion must also provide additional evidence of teaching commitment and success. Evidence of excellence in teaching can be demonstrated by some combination of the following: regular student teaching evaluations with median scores greater than six (6); nomination and/or receipt of teaching awards; high quality teaching materials; evidence of updating and developing new courses; unsolicited positive feedback from former students; use or development of innovative teaching methods (e.g., flipped classrooms; experiential learning; recitation section); participation in teaching development workshops or fellowships; authorship on lab manuals; authorship on a textbook; other comparable activities.

Candidates applying for promotion to Professor must also provide evidence demonstrating that they have maintained an established and respected reputation as a teacher.

Advising – A faculty member, at a minimum, must meet the following advising requirements to be considered for tenure and/or promotion:

- (i) Offering sufficient opportunities for student advising, based on CAS and Departmental expectations for availability.
- (ii) A record of maintaining regular, posted office hours.

To demonstrate excellence in advising, a candidate for tenure and/or promotion must also provide additional evidence of advising commitment and success. Evidence of excellence in advising can be demonstrated by some combination of the following: service on advising-related committees; nomination or receipt of CAS, University, or external advising award(s); other comparable activities.

Research Mentoring – A faculty member, at a minimum, must meet the following research mentoring requirements to be considered for tenure and/or promotion:

- (i) Meaningful involvement of an average of one (1) undergraduate or graduate student in research per semester after the first year of employment at UTC. This may include any student participating in an independent study/research course (BIOL/ESC/GEOL 4995, 4997, 4998; GEOL 4800, 4900; ESC 5997, 5998, 5999) and/or involved in the experimental design, collection of data, analysis or manuscript preparation, or curatorial/data archiving work.
- (ii) Complete at least three (3) of the following activities: serving as committee chair for an undergraduate honors student or a graduate student; serving as a committee member for an undergraduate honors student or a graduate student; sponsoring student presentations at meetings; sponsoring grant proposal submissions by students; awards for faculty sponsored student presentations at meetings; student publications in student or in regional, national or international peer reviewed journals; supervising additional students in meaningful research activities beyond the minimum listed above; other comparable activities.

Per the BGE Bylaws, the minimum teaching and advising expectations for NTT promotion include the following:

Teaching and Advising: In order to align Departmental and UTC policy, BGE considers faculty performance in the classroom and student advising in the evaluation of lecturer teaching performance. In BGE, evidence of having “achieved a reputation as an accomplished teacher” means the candidate must become an effective teacher at UTC. In BGE, having “achieved and maintained a reputation as an accomplished teacher” means that the candidate has an established a respected reputation as an effective teacher at UTC. BGE considers faculty performance in the classroom and student advising in the evaluation of teaching performance.

Teaching – A lecturer, at a minimum, must meet the following teaching requirements to be considered for promotion:

- (i) Evidence of effective teaching through: a. Student evaluation results with median scores of 5.0 or greater for all Course Content and Delivery and Course Instruction questions (scale of 0-7 with 7 being best) on average during the three (3) years prior to promotion consideration; and, or b. Multiple indicators of effective teaching. These indicators of teaching quality may include but are not limited to: student assessments, in-class activities, syllabi, learning outcome assessments, evidence of student learning, evidence of efforts to enhance teaching quality, and additional peer observations of teaching approved by the NTTRP Committee. The candidate should provide commentary explaining how these materials demonstrate effective teaching. The NTTRP Committee will determine if the commentary and evidence provided by the candidate demonstrate the ability and commitment to teach effectively.
- (ii) A majority of peer-evaluation ratings of “very good” or “excellent” during the last two semesters of peer evaluations.
- (iii) Evidence of responding positively to reasonable criticisms, offered through any of the following: student evaluations, peer evaluations, the NTTRP Committee, and the EDO process, by showing a willingness to change and improve.

Candidates applying for promotion to Senior Lecturer must also provide additional evidence demonstrating that they have maintained an established and respected reputation as a teacher

In BGE, the diverse strengths of our faculty and the varied needs of our programs are recognized and valued. TT and NTT faculty have differences in their defined teaching load and expectations, but the overall result is support for our students and excellence in teaching.

4.2.2.2. Research workload guidance and expectations

The College of Arts and Sciences Bylaws provide for each academic department to establish expectations for research, scholarship, or creative activities. Faculty are evaluated each year in the EDO process against these expectations. While the BGE Bylaws do not describe a specific faculty research workload policy, the Bylaws do describe that tenured faculty members in the disciplines in which TT faculty members work will recommend the standards, degrees of emphasis, and the appropriate types of research required for tenure. For tenure and promotion, the minimum research expectations include the following:

Research and Scholarly Competence: In BGE, evidence of having “achieved a good record in research, scholarly, or creative activities” means the tenure and promotion candidate must establish an independent and externally recognized research program that involves students at UTC. In BGE, having “achieved and maintained a good record in research, scholarly, or creative activities” means the promotion candidate has established an independent and nationally or internationally recognized research program that involves students at UTC. To be considered for tenure and/or promotion, at a minimum, the following criteria must be met:

- (i) Ongoing research activity: A candidate for tenure and/or promotion must provide evidence of ongoing and productive research activity. The Department values and encourages collaboration. However, all candidates for tenure and/or promotion must develop and successfully lead their own research program, regardless of whether their research program involves collaboration.
- (ii) Three (3) full-length peer-reviewed original research papers published in discipline-appropriate journals (i.e., journals related to the candidate’s area of expertise) and/or maps published by a government agency. One paper or map may be in press at the time of the candidate’s review. For papers, at least one (1) must be published in a national or international journal. A peer-reviewed book chapter may be substituted for one of the three required papers or maps.
- (iii) Externally-funded research grant submissions. A candidate for tenure and/or promotion should be lead PI or co-PI on at least two externally submitted grant pre-proposals or full proposals. If co-PI, a substantial portion of the grant activities and budget must focus on the candidate’s research program. Note: funding of these grants is not a minimum requirement for tenure or promotion consideration.
- (iv) Three (3) presentations given by the tenure or promotion candidate at professional meetings or institutions other than UTC, one of which must be national or international, if funding is available.

To demonstrate excellence in research, a candidate for tenure and/or promotion must also provide additional evidence of research commitment and success. Evidence of excellence in research can be demonstrated by some combination of the following: presentations at a conference or academic institution other than UTC beyond the minimum requirement stated above; peer-reviewed full-length publications in discipline-appropriate journals, peer-reviewed maps published by a government agency, and/or book chapters in a research book

or volume beyond the minimum requirement stated above; editor or co-editor of a scholarly book (not professional editing for service) or an invited special feature or proceedings in a peer-reviewed journal; author or co-author of a research-based book (does not include lab manuals); book review in a peer-reviewed journal; PI on a funded grant from an in-house (intramural) competition (e.g. Faculty Development Grant); author of short publication in a regional, national or international journal (e.g., research note, short commentary, or species list); plenary presentations at scientific conferences; PI or co-PI on a funded research grant; peer-reviewed conference proceedings; other examples of scholarly productivity (e.g. technical report of a finished research project submitted to a granting agency).

When demonstrating excellence in research, it is the candidate's responsibility to provide evidence of the level of quality, effort, peer review, and potential impact of the activities listed above to the RTP Committee and Department Head. Candidates applying for promotion to Professor must additionally describe and provide evidence that they have achieved a national or international reputation as a scholar in their field.

The Department recognizes that some faculty members may have relatively large teaching or service assignments that affect their ability to be research active. Thus, it is important that the Department allow for some flexibility in tenure and promotion expectations for research. The Department will consider the following alternatives to the stated minimum requirements for research above:

- (i) Tenure-track faculty members with higher than average teaching or service loads (e.g., >10 contact hours, >3 preps per semester, and/or more than double the Delaware norm for student credit hours or large administrative assignments) will not be deemed ineligible for tenure or promotion if they fail to meet the minimum requirements outlined above.
- (ii) A tenure-track faculty member who does not seek external funding to sustain a research program can substitute a grant submission with one (1) additional full-length research publication in a peer-reviewed journal or one (1) additional peer-reviewed map published by a government agency (resulting in an expectation of four (4) papers or maps).

While NTT do not have research expectations for annual evaluation and promotion, several of our NTT do participate in research and mentorship. We do not have NTT promotion guidelines related to research in the BGE Bylaws.

4.2.2.3. Service workload guidance and expectations

The College of Arts and Sciences Bylaws provide for each academic department to establish expectations for research, scholarship, or creative activities. Faculty are evaluated each year in the EDO process against these expectations. While the BGE Bylaws do not describe a specific faculty service workload policy, for tenure and promotion, the minimum service expectations include the following:

Service: In BGE, having “achieved a significant record of effective participation in professional activities other than teaching and research” or “achieved and maintained a significant record of effective participation in professional activities other than teaching and research” involves providing service that supports the University mission as an engaged metropolitan university and the research mission of the Department. Candidates for tenure and promotion are expected to actively participate in Departmental committees as assigned by the Department Head as well as provide service to the University, community, and their profession. At a minimum, candidates for

tenure and/or promotion should meet the following requirements:

- (i) Departmental service: Tenure-track faculty members are expected to actively serve on the Departmental committees that they are assigned to each year; the actual number of committee assignments will depend on Departmental needs and number of faculty in the Department.
- (ii) University and Discipline-Appropriate Community Service: Each faculty member will provide service to UTC and the community/region as appropriate given their professional expertise. Candidates for tenure or promotion are expected to participate in a minimum of two (2) University or discipline-appropriate community service activities on average per year. Examples of potential University and community service include, but are not limited to, the following: active participation in university committees; participation in university events; workshops for UTC students; participation in outreach or volunteer programs with community organizations; mentoring of K-12 students, or discipline relevant presentations at local K-12 schools; submission of grants for community/university service activities; serving as a judge for school, local and regional science fairs; participation in outreach or volunteer programs associated with local schools; other comparable activities.
- (iii) Professional Service: Candidates for tenure or promotion are expected to participate in a minimum of two (2) professional activities on average per year. Examples of professional activities include, but are not limited to the following: participation in professional organizations; membership on a committee or leadership for a professional organization; leadership position in a student (e.g., EDGE) or campus-based scientific organization (e.g., adviser for UTC chapter of Sigma Xi); participation in a professional development activity at a scientific meeting or a regionally or nationally recognized program (e.g., mentoring activity at a professional meeting, attending workshops sponsored by professional organizations, NSF or various regional and national laboratories); reviewer for an academic journal; reviewer for a granting agency; editorial position for an academic journal; host or co-host of a professional meeting or workshop; other comparable examples.

To demonstrate excellence in service, a candidate for tenure and/or promotion must provide additional evidence of service that substantially exceeds the minimum requirements listed above. Additionally, candidates for promotion to Professor are expected to demonstrate leadership in relation to service (e.g., effectively serving as the chair of committees, leading outreach activities, serving on editorial boards, successfully holding an administrative appointment) to demonstrate excellence in service.

NTT Faculty also have service expectations for annual review and promotion in the BGE Bylaws.

Service: In BGE, having “achieved a significant record of effective participation in professional activities other than teaching” or “achieved and maintained a significant record of effective participation in professional activities other than teaching” involves providing service that supports the University’s mission as an engaged metropolitan university and the mission of the Department. Candidates for promotion are expected to actively participate in departmental committees as assigned by the Department Head as well as provide service to the University and their profession. At a minimum, candidates for promotion should meet the following requirements:

- (i) Departmental Service: Non-tenure-track faculty members are expected to actively

serve on the Departmental committees that they are assigned to each year; the actual number of committee assignments will depend on departmental needs and number of faculty in the department.

Some lecturers have lab coordination duties. These lab coordination duties are varied and diverse, requiring substantial time dedicated to activities other than teaching and advising. As such, lab coordination duties are recognized as service to the department. Lab coordinators must provide a description of his/her lab coordination duties and evidence of effective execution of those duties.

- (ii) **University and Discipline-Appropriate Community Service:** Each faculty member will provide service to UTC and the community/region as appropriate given their professional expertise. Candidates for promotion are expected to participate in a minimum of two (2) University or discipline-appropriate community service activities on average per year. Examples of potential University and community serve include, but are not limited to, the following: active participation in university committees; participation in university events; workshops for UTC students; participation in outreach or volunteer programs with community organizations; mentoring of K-12 students, or discipline relevant presentations at local K-12 schools; submission of grants for community/university service activities; serving as a judge for school, local and regional science fairs; participation in outreach or volunteer programs associated with local schools; other comparable activities.
- (iii) **Professional Service:** Candidates for promotion are expected to participate in professional activities annually. Examples of professional activities include, but are not limited to the following: participation in professional organizations; membership on a committee or leadership for a professional organization; leadership position in a student (e.g., EDGE) or campus-based scientific organization (e.g., adviser for UTC chapter of Sigma Xi); participation in a professional development activity at a scientific meeting or a regionally or nationally recognized program (e.g., mentoring activity at a professional meeting; attending workshops sponsored by professional organizations).

Candidates applying for promotion to Senior Lecturer must also provide additional evidence demonstrating that they have maintained an established record of effective participation in service activities

4.2.2.4. Additional faculty obligations and expectations

University faculty have additional obligations and expectations that do not clearly fall within one of the above areas. These include participation in commencement as per the UTC Faculty Handbook and confirmation to the BGE Bylaws statement on collegiality as follows:

Collegiality: This criterion expands upon the UTC Handbook criterion requiring “demonstrated ability to relate appropriately to students and professional colleagues.”

In BGE, collegiality consists of a shared decision-making process and a set of values which regards members of the Department and other University constituencies as essential for the success of the Department, CAS and University. Central to collegiality is the foundation of academic freedom – the respect for differing opinions and points of view – which welcomes diversity and actively sponsors its opinions. Collegiality between faculty and staff, regardless of rank or status, incorporates mutual respect for similarities and for differences in background, expertise, judgments, assignment responsibilities and visions for the department. Collegiality also

consists of an ability to relate with students and a respect for similar and different opinions of students.

In BGE, the candidate for tenure and promotion must be a good citizen of the Department, CAS and University, must interact in a collegial and professional manner with colleagues, staff and students, and must serve as a good role model for students and a good representative of UTC. In turn, members of the RTP Committee are expected to be collegial to candidates for tenure and promotion and promote an environment in which different forms of collegiality can be expressed freely. The department supports a vision that differing viewpoints are valuable and essential to promoting academic freedom.

BGE policy conforms with the CAS vision that collegiality (or the lack thereof) impacts the assessment of performance. For this reason, the departmental faculty is mindful of the statement on collegiality in the CAS Bylaws.

The Department will assess collegiality based on:

- (i) Evaluation of the candidate's Statement of Collegiality in tenure/promotion documents.
- (ii) Evidence that a candidate receiving criticisms regarding collegiality during an annual review has appropriately responded to those criticisms. In the event that concerns are expressed about a candidate's collegiality, the RTP Committee chair must submit these concerns in writing to the candidate and Department Head as part of the candidate's annual review for reappointment. The candidate should arrange a meeting with the Department Head and/or chair of the RTP Committee to discuss the concerns. The candidate is also encouraged to write a response to written criticisms regarding a perceived lack or absence of collegiality, to be submitted to the RTP Committee chair and Department Head. The candidate should also address how s/he addressed these perceived concerns in his/her subsequent annual review or as part of Statement of Collegiality in a tenure or promotion application.

In BGE, the absence or lack of collegiality is defined as substantial evidence of sustained, intentional actions and statements that are detrimental to or interfere with the teaching, scholarly, and service goals of the Department, CAS, or University as well as the physical or mental well-being of students, faculty, and staff. The absence or lack of collegiality shall not be based on civil disagreements over academic issues or personality conflicts that do not result in disruptions to departmental, college, or university activities or are not detrimental to the physical or mental well-being of students, faculty, and staff.

NTT promotion expectations also include collegiality guidelines.

Collegiality: This criterion expands upon the UTC Handbook criterion requiring "demonstrated ability to relate appropriately to students and professional colleagues."

In BGE, collegiality consists of a shared decision-making process and a set of values which regards members of the Department and other University constituencies as essential for the success of the Department, CAS and University. Central to collegiality is the foundation of academic freedom – the respect for differing opinions and points of view – which welcomes diversity and actively sponsors its opinions. Collegiality between faculty and staff, regardless of rank or status, incorporates mutual respect for similarities and for differences in background, expertise, judgments, assignment responsibilities and visions for the department. Collegiality also

consists of an ability to relate with students and a respect for similar and different opinions of students.

In BGE, the candidate for promotion must be a good citizen of the Department, CAS and University, must interact in a collegial and professional manner with colleagues, staff and students, and must serve as a good role model for students and a good representative of UTC. In turn, members of the Non-Tenure-Track Reappointment and Promotion Committee are expected to be collegial to candidates for promotion and promote an environment in which different forms of collegiality can be expressed freely. The Department supports a vision that differing viewpoints are valuable and essential to promoting academic freedom.

BGE policy conforms with the CAS vision that collegiality (or the lack thereof) impacts the assessment of performance. For this reason, the departmental faculty is mindful of the statement on collegiality in the CAS Bylaws.

The Department will assess collegiality based on:

- (i) Evaluation of the candidate's Statement of Collegiality in reappointment/promotion documents.
- (ii) Evidence that a candidate receiving criticisms regarding collegiality during an annual review has appropriately responded to those criticisms. In the event that concerns are expressed about a candidate's collegiality, the Non-Tenure-Track Reappointment and Promotion Committee chair must submit these concerns in writing to the candidate and Department Head as part of the candidate's review for reappointment. The candidate should arrange a meeting with the Department Head and/or chair of the Non-Tenure-Track Reappointment and Promotion Committee to discuss the concerns. The candidate is also encouraged to write a response to written criticisms regarding a perceived lack or absence of collegiality, to be submitted to the Non-Tenure-Track Reappointment and Promotion Committee chair and Department Head. The candidate should also address how s/he addressed these perceived concerns in his/her subsequent annual review.

In BGE, the absence or lack of collegiality is defined as substantial evidence of sustained, intentional actions and statements that are detrimental to or interfere with the teaching, scholarly, and service goals of the Department, CAS, or University as well as the physical or mental well-being of students, faculty, and staff. The absence or lack of collegiality shall not be based on civil disagreements over academic issues or personality conflicts that do not result in disruptions to departmental, college, or university activities or are not detrimental to the physical or mental well-being of students, faculty, and staff.

4.2.3. Faculty course workloads across the Department

In BGE, all TT faculty are expected to establish productive research programs, and the standard teaching assignment for these faculty focuses on contact hours and the number of course preparations, with the goal of assigning TT faculty approximately nine contact hours and no more than three course preps. The BGE Bylaws specifically state that teaching assignments of more than these contact hours and/or course preps would constitute a heavier than typical teaching load for TT faculty. BGE has treated preps for two different meetings of the same lab course as two separate preps. Thus, a semester assignment for one TT faculty member might involve one lecture section (48 students enrolled) of a course plus two separate lab meetings of the same course. Another TT faculty member might be assigned one lecture course, one related lab course, and one unrelated lab course, while another TT faculty member might be assigned three distinct three-hour lecture courses. Understanding that not all courses and labs require identical

effort, the BGE associate head tasked with course scheduling consults with faculty members on a semesterly basis, considers their preferences, and seeks to assign teaching loads equitably. Given the variation in credit hours and contact hours associated with lecture and lab courses, the actual contact hour load for TT faculty in BGE generally varies between seven and 10 contact hours. Some of these faculty may be assigned a lighter load one semester that is offset with a heavier load another semester.

BGE uses a different approach to assign course loads to NTT faculty, given the focus of their positions on teaching and service but without the research expectations. Specifically, the standard course load assignment for NTT faculty focuses on contact hours, with the goal of assigning these faculty approximately 12 contact hours per semester. For example, a semester assignment for one NTT faculty member might involve two 3-hour lecture sections and three 2-hour lab sections. Another NTT faculty member might be assigned three 3-hour lecture sections and one 3-hour lab section, while another NTT faculty member might be assigned four 3-hour lecture sections. The College sets enrollment levels at which large introductory-level courses are considered double sections, and these levels are accounted for when assigning NTT course loads. The BGE associate heads who are tasked with course scheduling consult with NTT faculty members on a semesterly basis, consider their preferences, and seek to assign teaching loads equitably. This is all in consultation with the department head. Given the variation in credit hours and contact hours associated with lecture and lab courses, the actual contact hour load for NTT faculty in BGE generally varies between eleven and thirteen contact hours. Using the approaches described for both TT and NTT faculty, BGE has been able to offer the courses required for students to progress through degree programs, provide modest research releases to faculty, and conform to UTC workload policies.

Nearly all upper-division courses in BGE are taught by TT faculty, who also teach some lower-division undergraduate courses. The bulk of the lower division courses are taught by NTT faculty. The department has endeavored to reduce teaching loads for faculty and others involved in research via several mechanisms. These include the use of graduate teaching assistants to teach laboratories in our introductory Biology and Environmental Science sequences and the use of double lecture sections (i.e., dividing large groups of students into two sections that meet at the same time in the same room, in essence giving those who teach large numbers of students credit for twice the number of contact hours). In addition, the institution offers opportunities to receive partial reductions in course loads by providing research fellowships through the UTC Office of Research and Sponsored Programs.

4.2.4. Department teaching needs

The total annual Student Credit Hour production (SCH) by BGE fluctuated during the five-year reporting period, averaging 11,444.6 total SCH per year with a minimum SCH production of 11,112 in 2022-23 and a maximum SCH production of 11,691 in 2021-22. The average annual student credit hour (SCH) production per full-time faculty member in BGE was 351.7 with an overall decrease of about 13% during the reporting period (Table 4.4). The Department experienced about a 13% overall increase in its number of full-time faculty during the reporting period, from 30 full-time faculty in Fall 2018 to 35 full-time faculty in Fall 2022 and gained one TT faculty line during this time. The hiring of lecturers during the past five years has prevented increases in teaching load for tenure-track faculty (Table 4.5), especially in the case of introductory-level General Education courses. While adjunct faculty continue to contribute substantially to instruction in BGE (Table 4.6), the number of adjunct faculty teaching in BGE decreased 45% during the reporting period, from 20 adjunct faculty in 2018-19 to 11 adjunct faculty in 2022-23. In addition, adjunct faculty alleviate less SCHs in BGE per full-time faculty member than do adjuncts across the College or University (Table 4.6).

The SCH per full-time faculty member in BGE was greater than the SCH values for the university and usually greater or similar to the SCH values for faculty across the college during all five years of the reporting period (Table 4.4). The SCH for TT faculty in BGE also was greater than the SCH value for the university throughout the reporting period, but usually less than or similar to the value for CAS. With

adjuncts included, the SCH per instructor in BGE was substantially greater than the SCH values for both the University and CAS during all five years of the reporting period (Table 4.6). This suggests that adjuncts are alleviating more instructional needs across the college and university than in BGE, while our full-time faculty loads continue to be greater than those for both CAS and the University. Importantly, it has been challenging to find and hire quality adjuncts to teach in BGE given the low compensation offered to adjuncts in CAS.

Table 4.4 Student Credit Hours/Full-time Faculty Member/Academic Year

Area	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
UTC	323.0	309.4	313.5	300.4	298.0
CAS	358.1	344.1	348.5	329.9	328.2
BGE	376.1	349.8	351.4	354.3	326.8

Table 4.5 Student Credit Hours/TT Faculty Member/Academic Year

Area	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
UTC	441.2	449.3	458.8	436.3	438.7
CAS	513.3	510.4	520.8	493.9	500.7
BGE	490.5	501.9	483.1	487.1	463.0

Table 4.6 Student Credit Hours/Faculty Member/Academic Year (Adjuncts included)

Area	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
UTC	156.4	171.8	164.6	185.1	172.9
CAS	186.7	200.2	185.9	202.3	188.4
BGE	225.6	296.0	289.9	307.7	284.9

4.3 Faculty Diversity

In Fall 2022, the BGE faculty consisted of more female faculty than male faculty, which demonstrates a shift toward a female-dominated department over the past five years (Table 4.7). For both full-time and part-time faculty, BGE has greater percentages of female to male faculty than the College of Arts and Sciences and the University. However, our TT faculty remain male-dominated, with about 60% male and 40% female, while our NTT faculty are about 85% female and 15% male. The gender disparity of TT faculty in BGE has improved substantially since 2016, when just 26% of our TT faculty were female. While the percentage of full-time faculty in BGE who are female is greater than the percentage of faculty who are female faculty in both CAS and the University, the percentage of TT faculty who are female in both BGE and CAS remains lower than for the University, which reports that 46% of TT faculty are female.

Table 4.7 Gender of BGE, CAS and UTC faculty in Fall 2022.

	Full Time Faculty		Part Time Faculty	
	N	%	N	%
UTC				
Male	262	50.4	115	44.1%
Female	258	49.6%	146	55.9%
Unknown	0	0.0%	0	0.0%
Total	520	100.0%	261	100.0%
CAS				
Male	141	52.4%	59	46.8%
Female	128	47.6%	67	53.2%
Unknown	0	0.0%	0	0.0%
Total	269	100.0%	126	100.0%
BGE				
Male	19	54.3%	4	36.4%
Female	16	45.8%	7	63.6%
Unknown	0	0.0%	0	0.0%
Total	35	100.0%	11	100.0%

Most BGE faculty members are Caucasian, and as a whole the full-time BGE faculty represent less racial and ethnic diversity than faculty in CAS and the University (Table 4.8). Specifically, numerous ethnicities are represented in the CAS and UTC faculty, whereas BGE faculty are comprised of three ethnic groups (Caucasian, Black, and Asian). Among the full-time BGE faculty, the percentage of Caucasian individuals is slightly greater than the percentage of faculty who are Caucasian in CAS and UTC. Among the part-time BGE faculty, the percentage of Caucasian individuals is similar to the percentage in CAS but greater than the percentage in the University as a whole.

Table 4.8 Ethnic backgrounds of BGE, CAS and UTC faculty in Fall 2022.

	Full-Time Faculty		Part Time Faculty	
	N	%	N	%
UTC				
American Indian or Alaskan Native	1	0.2%	1	0.4%
Asian or Pacific Islander	44	8.5%	9	3.4%
Black or African American	34	6.5%	16	6.1%
Hispanic/Latino	11	2.1%	6	2.3%
Non-resident Alien	26	5.0%	1	0.4%
Unknown	5	1.0%	2	1.9%
White	399	76.7%	226	86.5%
Total	520	100.0%	261	100.0%
CAS				
American Indian or Alaskan Native	1	0.4%	1	0.8%
Asian or Pacific Islander	18	6.7%	6	4.8%
Black or African American	18	6.7%	4	3.2%
Hispanic/Latino	9	3.3%	1	0.8%
Non-resident Alien	7	2.6%	0	0.0%
Unknown	2	0.7%	1	0.8%
White	214	79.6%	113	89.6%
Total	269	100.0%	126	100.0%
BGE				
American Indian or Alaskan Native	0	0.0%	0	0.0%
Asian or Pacific Islander	3	8.6%	0	0.0%
Black or African American	2	5.7%	1	9.1%
Hispanic/Latino	1	2.9%	0	0.0%
Non-resident Alien	0	0.0%	0	0.0%
Unknown	0	0.0%	0	0.0%
White	39	82.8%	10	90.9%
Total	35	100.0%	11	100.0%

The department recognizes the gender, racial and ethnic disparities apparent in Tables 4.7 and 4.8 and is committed to increasing diversity among faculty, particularly through the recruitment and retention of women and people of under-represented groups.

4.4 Faculty Evaluation System and Faculty Improvement

UTC's Faculty Handbook addresses faculty appointment, evaluation, promotion, tenure, and termination in Chapter 3 for TT Faculty and in Chapter 4 for NTT Faculty ([Appendix 4-A](#)).

4.4.1 Tenure Track Faculty

For TT faculty, two distinct review processes occur each year:

1. Annual reappointment, until such time as the faculty member is tenured, or is terminated, and
2. Annual evaluation and development by objectives (EDO), which occurs for all full-time faculty, regardless of appointment classification. Documents generated through the EDO process are included in the dossier submitted for annual reappointment.

The criteria for reappointment, tenure and promotion, and annual review (EDO) are found in the Faculty Handbook ([Appendix 4-A](#)), the CAS Bylaws ([Appendix 4-B](#)) and the BGE Bylaws ([Appendix 4-C](#)). The criteria are also described in section 4.2.2 of this Self Study.

4.4.1.1 TT Faculty Reappointment

Annual reappointment requires that the faculty member submit a dossier to the department's Rank, Tenure, and Promotion (RTP) Committee, composed of all tenured faculty in the Department. The RTP Committee reviews the dossier, and the Department Head, after consulting with the RTP Committee, makes a recommendation to the next administrative level. The dossier should address the Criteria for Reappointment (UTC Faculty Handbook 3.10.4), which are similar to the Criteria for Appointment (UTC Faculty Handbook 3.2.1), and the Criteria for Tenure (UTC Faculty Handbook 3.10.4). The BGE Bylaws have more specific criteria which can be found in Section VI of the BGE Bylaws ([Appendix 4-C](#)).

4.4.1.2 TT Faculty Annual Evaluation and Development by Objectives (EDO)

EDO requires that each faculty member develop annual Individual Objectives regarding Teaching, Research, and Service with the advice of the Department Head. At the end of the review period, the faculty member submits an Individual Performance Report to the Department Head. The Department Head reviews the Individual Objectives and Individual Performance Report and evaluates the faculty member's performance based on one of four metrics:

- Exceeds Expectations for Rank,
- Meets Expectations for Rank,
- Needs Improvement for Rank, or is
- Unsatisfactory for Rank.

Each college and department establish standards for performance evaluation. The standards must be approved by the dean and Provost. The EDO process for TT faculty is detailed in the Faculty Handbook, 3.4. An additional review process, called Enhanced Post-Tenure Review (EPPR) is required of any tenured faculty member who receives "Unsatisfactory for Rank". All tenured faculty members are subject to Post-Tenure Review (PTR) every six years. PTR does not substitute for the EDO process.

The department has a peer review program for new TT faculty. Each semester tenured faculty observe and provide feedback to new faculty about their teaching. This process lasts for several years. This has proven to be a useful mechanism for new teachers. [Appendix 4-H](#) contains the department's Peer Evaluation of Instruction form.

4.4.2 Non-tenure Track Faculty Reappointment and EDO

For NTT faculty, reappointment is an administrative process that is linked with need and availability of funding. Lectures receive annual reappointment through the administrative process. Teaching appointments of Associate Lecturers may be made for a term of up to three years. Teaching appointments for Senior Lectures may be made for a term of up to five years. This is determined by the provost's office in consultation with the dean of the college and the Department Head.

Like TT faculty, NTT are subject to the EDO annual review process, which occurs for all full-time faculty, regardless of appointment classification. The scope of a non-tenure-track faculty member's

evaluation will be determined by the assigned duties specified in the faculty member's appointment letter, and the standards for evaluation should be consistent with the relevant standards of performance for teaching, research, and service as defined at UTC. Reporting of evaluation results should be consistent within the academic department and the college and are subject to the approval of the dean (UTC Faculty Handbook 4.4). NTT Faculty develop annual Individual Objectives regarding Teaching and Service with the advice of the Department Head. At the end of the review period, the faculty member submits an Individual Performance Report to the Department Head. The Department Head reviews the Individual Objectives and Individual Performance Report and evaluates the faculty member's performance based on one of four metrics:

- Exceeds Expectations for Rank,
- Meets Expectations for Rank,
- Needs Improvement for Rank, or is
- Unsatisfactory for Rank.

Each college and department establish standards for performance evaluation. The standards must be approved by the dean and Provost. There is not a process in the Handbook that addresses with the situation of a NTT faculty earning "Unsatisfactory for Rank".

The department has a peer review program for new NTT faculty. Each semester members of the NTTRP observe and provide feedback to new faculty about their teaching. This process lasts for several years. This has proven to be a useful mechanism for new teachers. [Appendix 4-H](#) contains the department's Peer Evaluation of Instruction form.

4.5 Faculty Professional Development

Academic Affairs requires all newly hired faculty to participate in the Teaching and Learning Institute, which is a semester long pedagogy workshop. Faculty must participate in the workshop within their first year of employment and are given a one course release to accommodate the increased work expectation. BGE faculty engage in a diversity of professional development activities, including programs arranged and led by the UTC Walker Center for Teaching and Learning. Our faculty have attended, participated in, or led professional development workshops on topics ranging from research skills (e.g., bird banding, genomics, computational, geospatial, and hydrology), faculty mentoring networks, development of online course initiatives, grant-writing workshops (e.g., NIH regional seminar), teaching creativity, IRB/IACUC training, and diversity and human resources training (e.g., SafeZone). Our faculty regularly develop new course proposals reviewed by the departmental curriculum committee. Several faculty members have received ThinkAchieve funding to support innovative teaching methods. Finally, several faculty members have engaged in fund raising efforts with the UTC Developmental Office. Over the last year, we have been working on raising funds for faculty instruction.

BGE faculty have submitted many grant proposals to internal programs and private, state, and federal funding programs. Between 2018-2019 and 2022-2023, our faculty secured \$1.3 million in extramural funding (Table 4.9) and applied for over \$9.5 million in funding. Our faculty have contributed to or led greater than 100 publications in peer reviewed journals, ranging from regional journals to international journals. They have published numerous book chapters, project reports, education guides, and books ([Appendix 4-I](#)). Faculty regularly present their research at regional, national, and international scientific meetings ([Appendix 4-J](#)).

Table 4.9 External Grant Awards/Fiscal Year, number of BGE grants is in parathesis

Area	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
BGE	\$71,979 (4)	\$478K (8)	\$142K (6)	\$336K (5)	\$ 347K (6)
CAS	\$7841K	\$1.3M	\$1.1M	\$2.2M	\$1.2M
UTC	\$11.3 M	\$11.4M*	\$ 13.7M**()	\$14.0M***	\$14.2M

*\$21.2M with CARES Act Funds due to COVID

**\$56.9M with HEERF Funds due to COVID

***15.2M with HEERF Funds due to COVID

Our faculty engage in a diverse range of service activities. BGE faculty regularly serve on departmental, college, and University committees. Our faculty serve on 3-4 departmental committees annually. Professionally, our faculty regularly review manuscripts for peer-reviewed journals and participate in professional societies. Some of our faculty serve as editors for scientific journals such as *Global Journal of Environmental Science & Management*, *Journal of Mammalogy*, *Journal of Mammalian Evolution*, *Journal of Medical & Biological Sciences*, *Journal of Paleontology*, *Remote Sensing*, and *Proceedings of the Royal Society*.

One faculty member has served as a president of a professional society, and others have served as program chairs for regional and national conferences (Association of Southeastern Biologists and Geological Society of America). Two Geology faculty are active in regional and national organizations, serving as chairs of major committees and as a division panelist. Some of our faculty members regularly review grant proposals, both internal and external (NSF) to the University. Our faculty also engage in service in the community, including activities with local nature centers, serving as science fair judges, service as board members, mentoring K-12 students, making presentations at local schools, and conducting interviews with local TV and radio stations.

A full list of faculty activities, including faculty development, scholarly activity, and service, is provided in [Appendix 4-K](#).

4.6 Faculty Engagement in Planning, Evaluation, and Improvement Processes that Measure and Advance Student Success

The department engages in numerous activities that advance student success. Some examples include:

- *Student learning outcomes*: We assess student learning outcomes in our courses (**see Section 1 Learning Outcomes**).
- *Student research*: The departmental faculty engage undergraduate students in research, relying on resources from external grants and internal programs including the Office of Research and Sponsored Programs, Office of Undergraduate Research and Creative Endeavors, and the Honors College. Many of the presentations and peer-reviewed publications generated by our faculty include student contributors. A detailed list of undergraduate students engaged in research can be found in [Appendix 4-L](#), a detailed list of undergraduate student presentations can be found in [Appendix 4-M](#), and a detailed list of undergraduate student papers can be found in [Appendix 4-N](#). Many of our students present at the UTC Research and Creative Activity Conference, a campus-wide event offering opportunities to make oral and poster research presentations, held annually during the spring semester. In addition, several of our laboratory courses are inquiry based, exposing a large portion of our undergraduate students to research.
- *Geology Field Trips*: Faculty in the Division of Geology lead annual Geology field trips, and all students in the Geology Program graduate having formulated and conducted a research project.

- *Academic & Career mentorship:* Academic advising in the College of Arts and Sciences is now handled by the [HUB Student Success Center](#). Students are assigned an academic advisor specializing in the student's anticipated major. Students interested in pre-health professions can pursue additional resources, including supplemental advising and events/experiences, in Pre-Health Student Services. The centralization of student advising is expected to create controlled consistency that will positively impact retention and student success. With or without reference from the Student Success Center, BGE faculty are now available to provide career mentoring to students. [The department maintains a list of career mentors for students in all areas of interest.](#)
- *Course development and improvement:* Many of our faculty have participated in professional activities aimed at improving instruction, including workshops and seminars sponsored by the UTC Walker Center for Teaching and Learning. Several of our faculty have been awarded small grants from the UTC ThinkAchieve program. These grants are used to develop activities that improve critical thinking skills and problem-solving. Curricular improvements include the addition of new courses as well as numerous program strengthening and streamlining efforts outlined in **Section 2 Curriculum**.
- *Residential Living and Learning Communities affiliated with BGE:* The department has two residential learning communities available for interested incoming students: Sustainable Mocs and the Medical Dental Interests Company (MEDIC). These residential learning communities provide opportunities for undergraduates with collective interests to participate in themed activities to supplement their shared classroom experiences. The Sustainable Mocs RLC was created in Fall 2022 and the MEDIC RLC was created in Fall 2023. We have already completed contracts to continue these student opportunities for 2024.
- *Scholarships and Awards:* The Department offers five scholarships/awards in Geology and eight scholarships in Biology and Environmental Science. Awardees of these scholarships and other undergraduate recognitions are honored at a yearly department awards banquet where they are introduced by faculty.

4.7 Assessment of Faculty Strength, Weaknesses and Recommendations for Change

4.7.1 Faculty Strengths

The areas of expertise of the Department of Biology, Geology, and Environmental Sciences are diverse, allowing us to offer a diverse curriculum and contribute to a positive student experience. Our greatest strengths are our faculty accomplishments, our positive impact on student success, and our faculty awards.

4.7.1.1 Faculty Accomplishments

The BGE faculty have amassed an outstanding record in all three areas of faculty responsibility over the past five years. The department has been among the leaders at this institution in establishing high academic standards. The students have bestowed favorable ratings on the quality of our teaching. Course learning evaluations of BGE faculty are consistently strong and in line with evaluation results for other faculty in the College of Arts and Sciences and the university.

The faculty have amassed a strong record of scholarly activity during the past five years. Between 2018-2019 and 2022-2023, BGE faculty accounted for 21% of the extramural funding generated by the College of Arts and Sciences. This number was as high as 37% in 2019-2020. During the five-year review period several BGE faculty were supported by significant and competitive external programs, including the National Science Foundation CAREER, Population and Ecology Core, IRES, and REU programs and the National Institutes of Health R15 program. Departmental faculty have published more than 260 papers and book chapters in refereed journals of regional, national, and international scope and edited volumes, government reports, and pedagogical works. The departmental faculty also have been active attendees and

presenters at regional, national, and international meetings, even during the height of the COVID pandemic, presenting virtually. In line with the university mission, the department has a strong record of professional, departmental, college, and university service. We also have been engaged in the community in numerous ways, including outreach activities with local wildlife centers, collaborations with local health care facilities, and the creation of a community garden.

4.7.1.2 Impact on Student Success

The strengths of our faculty benefit our undergraduate students. Local, regional, national, and international collaborations provide a strong professional network for students, increasing their likelihood of success. Many of the presentations and peer-reviewed publications generated by our faculty include student contributors, but also, our students have been first author on presentations and publications. See Appendices [4-I](#), [4-K](#), [4-M](#), [4-N](#).

Many of our undergraduate students have been successful in securing internal funding from sources including the UTC Provost Student Research Award (PRSA), URaCE Scholarship, Engagement, the Arts, Research, and Creative Activity (SEARCH) Award, and Undergraduate Honors College.

4.7.2.3 Faculty Award

As a measure of the esteem in which the faculty of this department are held by the university administration, the department has among the highest number of named professorships of any department on campus, including nine UC Foundation Professors, two Guerry Fellows, one Professorship dedicated to research in Chestnut Biology (Davenport), and two Professorships dedicated to outstanding teaching (Collins Professorship and the Wilson Professorship). The departmental faculty also have earned institutional awards over the years for outstanding teaching, advising, and research.

4.7.2 Weaknesses and Needs

There remain serious challenges that must be faced by the department. Our greatest need is for more resources, including more funding and equipment for instruction and research, additional tenure-track faculty lines that would increase opportunities for student research mentoring, and funding for more support personnel (e.g., lab managers, museum collection managers, a greenhouse manager, more advisors, and more office help). Although faculty diversity has improved since our previous program review, we need to continue efforts to attract more women and under-represented minority applicants during future hires of tenure-track faculty and to retain those faculty.

4.7.2.1 Faculty workloads and new hires:

The overall 12% decrease in undergraduate student enrollment in BGE from 2018-19 to 2022-23 has alleviated some of the demand on our faculty and resources. However, enrollment in our undergraduate ESC program has grown by nearly 40%, which has created increased demands for faculty and resources in this area. Across the department, our student credit hours are consistently higher than the university average, and many faculty are consistently teaching larger sections of core courses than they previously taught. In addition, several of our faculty have received teaching load reductions due to high scholarly activity, successful grant writing, and administrative roles within the department and the university. To accommodate these reductions in faculty availability, many NTT faculty take on teaching overloads, and some of our TT faculty regularly teach core courses at the expense of more specialized, upper-level undergraduate or graduate courses. We regularly hire adjuncts to cover courses typically offered by TT faculty with teaching load reductions or omit them from the schedule. Because of low pay levels set by the institution for adjunct instructors, and the difficulty of finding individuals with the expertise and willingness to teach advanced upper-level courses, the department faces ongoing problems in recruiting and retaining qualified adjunct faculty. Low pay for full-time faculty poses recruitment and retention difficulties, especially when starting salaries for NTT faculty are \$40K for MS degrees and \$45K for PhD degrees and TT faculty are mid-\$60K.

4.7.2.2 Faculty Diversity

Although gender and ethnic diversity have improved overall in the last five years (due to recent hires), the department continues to face challenges in increasing diversity and in increasing the number of tenure-track positions held by women. The merger of Biology and Environmental Science with Geology during the previous review period continues to pose challenges associated with historical differences in expectations for promotion and tenure between the formerly separate departments. These challenges include differences in teaching loads and measures of scholarly activity.

4.7.2.3 Equipment and Research Space

Across the department, faculty continue to be limited by equipment resources that could increase research capacities, as well as limited funding for the maintenance of existing equipment. Faculty in the Geology program, which continues to be housed in Grote Hall, are especially impacted by research space limitations, and continue to utilize storage closets, classroom, and teaching lab spaces for conducting research. The lack of stable funding to purchase, repair, and replace equipment negatively impacts BGE faculty engaged in formal and informal teaching research activities and student learning. While the renovation of Holt Hall included a dedicated computer lab for teaching, computational resources continue to be limited in most teaching labs, which can limit opportunities for students to develop quantitative and computations skill sets.

4.8 Recommendations for change

Despite having one of the largest undergraduate programs at the university, the department continues to be challenged by faculty, infrastructure, and other resources. To help address these challenges, we make the following recommendations:

- *Additional faculty and staff:* Due to continued high enrollment in the undergraduate Biology program, significant growth in the undergraduate Environmental Science program, and recent faculty attrition, the department continues to face challenges related to course offerings. The filling of recently vacated lines and addition of new tenure-track positions in Environmental Science would help us to meet the needs of large undergraduate programs and our graduate program in Environmental Sciences. In general, more faculty hires also would allow us to teach core courses in smaller sections, as we were able to do in the past. Faculty with expertise in genetics and ecology who focus on study systems unique to the department would allow us to reduce the sizes of our core genetics and ecology courses while offering novel research opportunities for students. We also recommend the hiring of one to two staff to assist full-time faculty with important tasks including animal care, large equipment maintenance, and natural history collections management. To competitively recruit faculty, we recommend that salaries and start-up for tenure-track faculty (~\$85,000) be increased. Likewise, to retain faculty, we recommend that salaries for current full-time faculty and adjuncts be increased to meet national norms. During the program review period, we experienced the retirement of one Biology faculty member who taught genetics courses and one Geology faculty member with expertise in structural geology; both lines have since been filled by new hires. We also hired a new faculty member with expertise in hydrology and aqueous geochemistry, who recently left the department and two new faculty members with expertise in applied genetics and molecular techniques, one of whom also recently left the department. In addition, a faculty member with expertise in aquatic ecology recently passed. We anticipate hiring new faculty to replace two of these recently vacated lines during the 2023-24 academic year and will propose to the college that we fill the other recently vacated line during the 2024-25 academic year.
- *New space:* Our faculty are currently located in two academic buildings. After the completion of the Holt Hall renovations, Biology and Environmental Science faculty were mostly rehoused in Holt, though a few have offices and research space in Grote. Geology faculty have remained in Grote Hall, where their research space continues to be especially limited. It is critical to provide

research space to support Geology faculty research, given that Geology is merged with Biology and Environmental Science, two programs that have historically been very active in research. To address continued space needs (which impact our teaching and research), we recommend that the university explore the potential for investing in a new building with sufficient space for all current BGE faculty, space for future hires, and modern teaching and research facilities for the entire department.

- *Equipment, Computers, and Classroom Technology:* BGE needs a new and stable source of funding to purchase, repair, and replace equipment and computers. BGE needs modern IT teaching capability and equipment in all teaching laboratories and classrooms. The Holt Hall renovation has remedied some of this need, but we have needs for additional resources that would facilitate student training given the increased importance of quantitative and computational skill sets in our fields.
- *Increased diversity:* Although the diversity of our faculty has increased since the last program review, we need to continue efforts to increase the number of applications for future positions from women and under-represented minority groups. We have recruited through traditional avenues but have also sent faculty to the SREB conference to promote our available positions.

5 Learning Resources

5.1 Evaluation and Improvement of Equipment and Facilities

The department is in both Holt and Grote Halls. The square footage space is 40,014 ft² for Holt Hall and 11,753 ft² for Grote Hall, for a combined total of 51,767 ft². In Holt Hall, this includes all offices, storage, research labs, and teaching labs. In Grote Hall, this includes all offices, storage, research labs, anatomy/physiology labs, and geology classrooms/labs. Academic Affairs controls all general use classrooms in both buildings and though we use the rooms frequently, there are other disciplines who teach in those classrooms.

5.1.1 Instructional Equipment

A detailed list of current departmental equipment that initially cost at least \$1,500 is provided in [Appendix 5-A](#). Of note, current major equipment includes:

- Confocal microscope
- Scanning electron microscope
- Environmental controlled growth chambers
- Fluorescence and gas exchange system package
- Two Tuttnauer steam sterilizers (autoclaves), one of which was purchased in Fall 2023
- Microarray scanning system
- Microplate reader
- X-ray fluorescence Spectrometer
- Seismometer
- Large cutting saws
- Thin-section machine
- Shaker Separation Table, purchased in 2023
- Frantz Magnetic Barrier Laboratory Separator, purchased in 2023
- Multiple petrographic microscopes
- Teaching microscopes
 - 209 compound microscopes
 - 94 stereoscopes
 - ~20 polarizing microscopes
- Water Filtration Systems (all Millipore Sigma)
 - Direct-Q 5 UV
 - Elix Essential 5
 - Milli-Q Direct 8
 - Direct-Q 3 UV, replaced September 2023

5.1.2 Process for Evaluating Equipment Needs

Equipment needs are evaluated annually. The Equipment Committee maintains a ranked equipment needs list of items that play critical roles in teaching and/or research labs. A detailed ranked equipment list for the department is provided in [Appendix 5-B](#). Faculty may request that new items be added to the list at any time, but the ranking of the list occurs one time per year in the early spring. All new items placed on the list are added to the bottom. However, if the Equipment Committee agrees that the justification for needing the equipment warrants moving that item up in the rankings, then that item will gain a better ranking than older items on the list that have lesser documented need. For a new item to be added to the list a faculty member fills out a form and submits the request to the committee chair. The following information must be included on the form:

- Details of the item(s) requested

- Cost for the item(s).
- Justification for the requested items must be included
- The category of the equipment needed
 - To maintain course instructional integrity
 - To meet existing infrastructure deficiencies
 - To meet continuing student/faculty research objectives
 - Some estimation of the annual number of students to be impacted by the purchase of the equipment,
 - If in support of teaching labs, a listing of the course number affected.

Once the committee ranks the list for a given year, it is shared with the Department Head, who shares it with the rest of the faculty, asking for their comments. When funds become available the Department Head uses the list to select items to purchase that are most highly ranked first, unless upper-level administrators or potential donors indicate a preference to fund purchase of lower ranked items.

5.1.3 Service contracts and repairs

The department currently holds a service contract with OmniScientific. This company provides troubleshooting and repairs for scientific equipment, especially the two autoclaves. They also perform preventative maintenance on the autoclaves. The service contract is renewed yearly and is \$30,000 annually. In addition to the agreement with OmniScientific, the department holds a service contract with MilliporeSigma to service our four distilled water filtration systems. The cost this year was approximately \$7,750, which is a decrease from last year as the system that was replaced would fall under warranty. Otherwise, the cost is around \$10,300 annually. Other equipment is serviced annually or quarterly depending on the needs, these include the growth chambers, balances, pipets, and microscopes. Our BioSafety cabinets and Ductless Fume Hoods get certified yearly by Steris (Controlled Environment Certification Services). Additionally, several pieces of equipment are regularly in need of repairs and preventative maintenance. These services are not contracted and are paid per visit. The primary pieces of equipment that get regular visits from a local repair company are –40 and –80-degree Celsius freezers, scientific refrigerators, walk-in coolers, and any HVAC systems connected to greenhouses or other outbuildings. All visits are covered by the department budget, either state operating, lab fees, or gift funds.

5.1.4 Teaching Labs

Functional and well-equipped teaching labs are essential for the teaching needs of our faculty and Graduate Teaching Assistants (GTAs). The needs of teaching labs are evaluated annually, and lab fees are used to support the purchase of lab supplies. A high volume of students pass through introductory 1000-level labs each year, totaling more than 1,200 students in Biology, 300 students in Environmental Sciences, and 600 students in Geology. BGE has five rooms devoted to introductory labs, including three for Biology, one for Environmental Science, and one for Geology. The lab fees generated each year for all three divisions are more than \$170K. Details on lab fees can be found in **Section 6 Budget**. The fire code seating limit in individual lab sections is 24 students for Biology and Environmental Science, and 30 for Geology. The department typically runs about 92 individual introductory lab sections per year with approximately 2,200 students enrolled. Below, we provide details on the major Biology, Geology, and Environmental Science labs and their associated resources.

5.1.4.1 Introductory Biology, Environmental Science and Geology Labs

All introductory Biology labs have a compound microscope, with a camera and small monitor that sits on top of the microscope. This microscope was purchased for those students that are visually impaired and cannot see through the ocular lenses of a regular microscope. This allows the students to still learn how to

use a microscope and see the specimens. A second microscope equipped with a camera and monitor was purchased in the Fall of 2023.

- Principles of Biology I (BIOL 1110L), Holt 216 and 223: In each of the Principles of Biology I labs, every student has their own microscope to use (24 in each room). Mounted televisions are connected to computers that allow instructors to show required videos, give presentations, and share pictures of microscope slide specimens.
- Principles of Biology II (BIOL 1120L), Holt 224: There are 24 microscopes available for the students to use, which means that there is one microscope per student. Mounted televisions are connected to computers that allow instructors to show required videos, give presentations, and share pictures of microscope slide specimens. When the microscope with the camera is not in use for a visually impaired student, instructors can use this scope to show students microscope slide specimens.
- Introduction to Environmental Science (ESC 1500L and 1510L), Holt 225: The lab is kept well stocked with glassware and supplies for specific lab activities, in part due to the introduction of lab fees years ago. For example, the ESC lab is well stocked with microscopes (12 compound microscopes and 12 dissecting scopes, making it possible to have a microscope at each individual table). The ESC lab also has digital balances, functionally replacing the triple-beam balances that had been previously used for so many years (it should be noted that Dr. Reynolds adds digital balances every so often when he places orders, with the ultimate goal being to have a balance on each lab table, 12 total). Dr. Reynolds, it should additionally be noted, occasionally adds new lab activities to the 1500L and the 1510L curriculums. The department has been excellent at ordering supplies in support of these new labs. Mounted televisions are also connected to a computer that allows instructors to show required videos, give presentations, and share pictures of microscope slide specimens.
- Physical Geology (GEOL 1110L) and Earth and the Environment (GEOL 1105L), Grote 206: These labs share the same room, so scheduling is strategic to avoid conflict. Equipment available in the lab includes three mounted televisions and a projection screen that allow videos, presentations, timers, and other images to be shown from the computer. Rock and mineral hand sample boxes and Brunton compasses are kept in this room, in addition to basic lab supplies. In the storage room between Grote 206 and 208, there are supplies such as a topo box to project topographic contour lines on sand that can be changed in real time, several shelves of additional rock, mineral, and fossil samples, some glassware, and other lab supplies such as laminated handouts.
- Historical Geology (GEOL 1120L), Grote 208: This is a multi-use room that is used for both lecture and lab. Equipment available includes projector and document camera with Vivi wireless connection, sample storage cabinets, mineral, rock, and sand samples, fossil specimens, and two petrographic microscopes (one with a camera and screen).

5.1.4.2 Service Labs, Anatomy, Physiology, and Microbiology

Functional Human Anatomy (BIOL 2060), Human Physiology (BIOL 2080), and Microbiology and Health (BIOL 2100) are service labs taught by the department. These serve more than 450 students each year, most of which are pre-nursing and health and human performance majors. Anatomy lab is taught in Grote 109 and the Physiology lab is taught in Grote 108. The teaching equipment in the lab includes a computer that projects to TV monitors placed around the room. There is a raised platform with a computer, document camera, and attached microscope. The primary equipment for the labs includes:

- Two 45 cubic foot double door refrigerators for specimen storage
- Dissecting pans and tools
- Histology materials
 - 15 light microscopes
 - Prepared slides of selected tissue types

- o Hanging skeletons
 - Three real bone
 - One plastic
- o Eight real bone disarticulated skeletons
- o 11 real bon skulls
- o Five bone cast/plastic skulls
- o Somso and 3B Models
 - Arm muscles
 - Leg muscles
 - Torso muscles
 - Oral cavity
 - Thoracic cavity
 - Nasal cavity
 - Abdominal cavity
 - Human reproductive system (male and female)
 - Circulatory system
 - Respiratory system
 - Digestive system
 - Urinary System
 - Eye
 - Brain
 - Ear
 - Head and neck, new November 2023
 - Torso with head, new November 2023
- o Histology models
 - Bone
 - Muscle
 - Epithelium
 - Nervous tissue

Microbiology lab is taught in Holt 330. This location is used for both BIOL 2100 and the upper-level majors' course, Principles of Microbiology, BIOL 4220. The teaching equipment includes a computer that is linked to a projection screen with a document camera attached. Microbiology labs include physical lab space for both teaching and research and dedicated spaces for the Microbiology Preparation Lab and Autoclave room. Supplies include:

- 10+ types of bacterial growth media, most of which come in dehydrated form
- UV Sterilizers for Eye Protection
- Lab coats
- Plastic petri dishes
- Incubators
- Multiple refrigerators
- Biosafety Cabinet
- Two Tuttnauer steam sterilizers (autoclaves), one of which was purchased in Fall 2023
- Materials used by Microbiology Preparation Lab to produce bacterial cultures:
 - o Balance
 - o Three hot plates/mixers
 - o Two peristaltic pumps dispensers
 - o One pH meter
 - o Two Bunsen burners
 - o One Dishwasher

- o Loops and needs for inoculation
- o Glassware
 - Erlenmeyer flasks ranging in size from 125 ml to 2.0 liters
 - Test tubes of various sizes
 - Graduated cylinders
 - Beakers of different sizes

From 2012 to present, the microbiology prep lab of BGE has been functioning under the supervision of a Lab Coordinator which is also a full faculty teaching position. The Lab Coordinator reports to the Biology, Geology, and Environmental Science (BGE) Department Head and oversees the day-to-day operations of the Microbiology Preparation Laboratory. This ensures faculty have access to media, cultures, and equipment necessary to meet the laboratory competencies of their courses in a safe, clean, and organized environment. The Microbiology Prep Lab and the coordinator are responsible for the preparation of microbiology teaching laboratories, including BIOL 2100L, BIOL 4200L, BIOL 4430L, and BIOL 4530L. The coordinator is responsible for the supervision, training, and evaluation of student laboratory assistants; supervises the ordering of all laboratory supplies; maintains the inventory files and ensures that all prep room chemicals are properly stored and documented; maintains stock cultures for microbiological samples; ensures that all biological specimens, equipment, and other materials are properly stored; ensures that all chemical and biological waste is properly collected, stored, and removed for disposal and ensures that all laboratory equipment and instruments are properly maintained. The coordinator, along with an average of two student assistants per semester, ensures that all labs meet applicable safety regulations and the faculty have the materials and equipment needed to teach their courses.

5.1.4.3 Upper-Level Biology, Environmental Science, and Geology Labs

Upper-level and core Biology and Environmental Science labs are typically scheduled in all-purpose lab rooms in Holt Hall, equipped with lab benches and relevant equipment (e.g., scopes, slides, specimens). Biology and Environmental Science has dedicated teaching labs, some of which are also used for research. Upper-level Geology lectures and labs are taught in Grote 210 and 208, which are multi-purpose rooms that hold up to 30 students. Details of the lab space available primarily for teaching Biology, Geology, and Environmental Science lab classes is provided in Table 5.1

Table 5.1 Current use of teaching lab space for Biology and Environmental Science.

Teaching Laboratory Space/Room	Current Use		Classes Taught
	Teaching	Research	
Holt 110	X	X	Mudroom used for storage of field equipment
Holt 112	X	X	Plant Morphology
			Plant Taxonomy
Holt 120	X	X	Cellular Biology
			Genetics
Holt 123	X		Animal Behavior
			Ichthyology
			Intro to Soil Resources
			Limnology and Reservoir Ecology
			Ornithology
			Wildlife Education and Rehabilitation
Holt 216	X		Principles of Biology I

Holt 223	X		Principles of Biology I
Holt 224	X		Principles of Biology II
Holt 225	X		Introduction to Environmental Science I
			Introduction to Environmental Science II
Holt 228	X		Entomology
			Human Development and Disease
			Meiofauna Biodiversity
			Parasitology
			Pollinator Biology
Holt 230	X		Air and Water Pollution
Holt 318	X		Ecology
			Plant Ecology
			Toxicology
Holt 321	X		Ant Ecology
			Comparative Vertebrate Zoology
			Dendrology
			Histology
			History of Evolutionary Thought
			Mycology
Holt 330	X		Microbiology and Health
			Principles of Microbiology
Holt 331	X		Bioremediation
Grote 106	X		Rock storage room
Grote 107	X	X	Rock prep and thin section lab
Grote 108	X		Human Physiology
			Introduction to Animal Physiology
Grote 109	X		Functional Human Anatomy
Grote 206	X		Earth and the Environment
			Oceanography
			Physical Geology
Grote 208	X		Earth Surface Processes Geology
			Historical Geology
			Paleontology
			Sedimentology and Stratigraphy
Grote 209	X	X	Research Design
			Senior Research Project
Grote 210	X		Hydrology

Multidisciplinary Research 102	X		Mineralogy
			Petrology
			Geographic Information Systems (ESC)
			Remote Sensing & Imagery Analysis (ESC)

5.1.5 Research Labs

Biology, Geology, and Environmental Science faculty also have dedicated research space, some of which is also used for teaching. Worth noting is that Holt 313-317 are not managed by BGE, but by the Institutional Animal Use and Care Committee (IACUC) and the Vice Chancellor for Research. Only faculty who have assigned space have access to the rooms. The BGE Department Head and Faculty Associate (who have sub-masters for the building) do not have access. Details of the lab space available primarily for Biology, Geology, and Environmental Science research are provided in Table 5.2.

Table 5.2 Current use of research lab space for Biology, Geology, and Environmental Science

Research Laboratory Space/Room	Lab Name	Faculty: <i>Field of Research</i>
Fortwood Greenhouse	The Fortwood Street Greenhouse and Nursery	Dr. Hill Craddock: Chestnut breeding (with The American Chestnut Foundation), Dendrology, Mycology, Campus Landscape Committee/Tree Care, Linda Collins Arboretum, MS and DHON student research space
Holt Greenhouse	Holt Green House	Available to all faculty who need use of a greenhouse, used primarily by Dr. Jose Barbosa who cultivates the Teaching and Learning Garden
Grote 107	Rock Prep and Thin Section Lab	All Geology Faculty
Grote 110	Plant Ecology Lab	Dr. Jennifer Boyd: Plant Ecology, Ecophysiology, Species Rarity
Grote 111	Geological and Environmental Remote Sensing Lab	Dr. Azad Hossain: Geological and Environmental Remote Sensing Laboratory (GERSLab)
Grote 112	Evolutionary Ecology Lab	Dr. Hope Klug: Evolutionary and Behavior Ecology, Fish Behavior and Conservation
Grote 113	Biogeochemistry Lab	Dr. Ashley Manning-Berg: Sedimentology, Geobiology, and Low-Temp Geochemistry (Carbonate, Chert, Microbial Decomposition, Water Chemistry, and Microplastics) and Future use by new assistant professor (search underway)
Holt 101	Ichthyology Collection	Dr. Francesca Leasi. Microscopic invertebrates collection and future use by new assistant professor (search underway)

Holt 101A	Ichthyology Collection	Future use by new assistant professor (search underway)
Holt 102	Amphibian/Reptile Conservancy	Dr. Tom Wilson: Amphibian and Reptile Conservation Ecology
Holt 102A	Fungi Collection	Dr. Hill Craddock: Mycology
Holt 103	Insect Collection	Dr. Stylianos Chatzimanolis: Beetle Systematics & Paleoentomology
Holt 104	Mammalogy Collection	Dr. Tim Gaudin: Mammalian Systematics, Paleontology, Biogeography and Comparative Anatomy
Holt 107	Spring Wildflower Pilgrimage HQ	Dr. Joey Shaw: Public Outreach and Education, Botany, Field Botany.
Holt 107A	Ornithology Lab/Collection	Dr. David Aborn: Avian Ecology & Management
Holt 112	Jane Holden Teaching Lab	Dr. Joey Shaw: Botany, Field Botany, MS student space to spread specimens.
Holt 114A	Plant Molecular Biology/Yeast Genetics	Dr. Jose Barbosa, Biochemistry and Molecular Biology of Plants and Yeast Genetics
Holt 115	Plant Molecular Biology/Yeast Genetics	Dr. Jose Barbosa, Biochemistry and Molecular Biology of Plants and Yeast Genetics
Holt 116	Herbarium	Dr. Joey Shaw: Botany, Field Botany, MS student research, supporting regional resource
Holt 117	Field equipment storage room	Dr. Tom Wilson [Herpetology] and Dr. Tim Gaudin [Mammalogy] - site to store dry equipment for field research
Holt 120A	Genetics Research Lab	Dr. Jannatul Ferdoush: Molecular Biology and Genetics
Holt 201	Systematic Entomology Lab	Dr. Stylianos Chatzimanolis: Beetle Systematics & Paleoentomology
Holt 227A	Mammalogy Research Lab	Dr. Tim Gaudin: Mammalian Systematics, Paleontology, Biogeography and Comparative Anatomy
Holt 301	Radioactive Materials Lab	Dr. Henry Spratt: Microbial Ecology
Holt 304	Microbiology Research	Dr. David Giles: Microbial Pathogenesis
Holt 305	Microbial Ecology Lab	Dr. Henry Spratt: Microbial Ecology and Clinical Microbiology
Holt 305C	Autoclave room	Dr. Henry Spratt: Microbial Ecology and Clinical Microbiology; Dr. David Giles: Microbial Pathogenesis; Dr. Jose Barbosa: Molecular Biology; Dr. Jannatul Ferdoush: Molecular Biology
Holt 305D	Micobiology Prep room	Dr. Henry Spratt: Microbial Ecology and Clinical Microbiology
Holt 306	Herpetology/Team Salamander	Dr. Wilson: Student Centered Group Focused on Monitoring Amphibian and Reptile Populations

Holt 308	Integrative Ecology Lab	Dr. DeAnna Beasley: Urban ecology, insect ecology, public science
Holt 309	Behavioral Ecology Lab	Dr. Loren Hayes: Animal social systems
Holt 317 A, B, C	Animal Facilities	IACUC Space, Dr. Wilson: Turtle Survival Alliance
Holt 318A	Environmental Toxicology Research Lab	Dr. Sean Richards: Toxicology
Holt 320	Mammalogy Preparation Lab	Dr. Tim Gaudin: Mammalogy - site of specimen prep for mammals, houses dermestid beetle colony for cleaning skeletons
Holt 323	Molecular Genetics Research Lab	Dr. Francesca Leasi. Meiofauna Biodiversity and Environmental DNA Studies and expansion space available for a new hire.
Holt 324	Rock Preparation Lab	Dr. Jennifer Taylor: Structural Geology, Petrology, and Geochronology and expansion space available for a new hire
Holt 350i	Chestnut Lab/Mycology Lab	Dr. Hill Craddock: Chestnut breeding, chestnut systematics, Mycology, MS student research space, DHON student research space

5.2 Learning and Support Resources to Support Teaching and Learning

5.2.1 Motor Vehicles and Other Vessels

The department currently has an 8-passenger 4wd SUV (purchased in 2022) with towing ability, a 12-passenger van, and one single cab 4wd truck with towing ability that can be used by faculty, staff, and employed students for teaching and research activities. Reservations for these vehicles occur through a shared Google calendar. Use priority is given to teaching. Additional vehicles can be reserved from the motor pool at a cost. BGE has two additional vehicles purchased to support specific research programs: a small Toyota SUV for the American Chestnut Restoration Program and a four door Ford heavy duty dually truck to trailer Dr. Wilson's research boat.

BGE has one general use boat that can be used by faculty, staff, and employed students for teaching and research activities and three boats purchased to support specific research programs. In 2021, BGE purchased a general purpose 21.5' Tracker Grizzly jon boat that can be towed by the SUV or the single cab truck. This boat replaces a 21-foot pontoon boat that was totaled by a falling limb years ago. The Tracker is powered by a 115hp 4 cycle Mercury outboard motor and is a shallow draft stable boat with low sides suitable for aquatic sampling. The boat is equipped with all required safety gear. The 9-person capacity Tracker is available for use by all faculty for teaching and research purposes.

Research boats purchased to support specific faculty include a 26' river research boat, a motorized kayak, and a 15' jon boat. The BGE river research boat is called the *utC Serpentina* and it was designed by one of our faculty and built by Clarke Custom Boats and Trailers. The *Serpentina* is a 26-foot heavy-duty research vessel with a shallow draft and is designed to accommodate nets, turtle traps, etc., and carry up to 24 people. Primary power is from a 200hp 2 cycle Mercury outboard motor. The boat is equipped with an auxiliary motor, fuel cell, running lights, submersible lights, three on board batteries, depth finder, GPS, underwater camera, sonar, two-way communications, and appropriate safety gear. The department

also has an 11-foot Kayak (made by Mokai Industries) that is jet propelled by a Honda inline motor. BGE also has a 15' G3 jon boat powered by a 40hp 2 cycle Yamaha outboard motor and equipped with a trolling motor and safety equipment. The department also has a 14-foot utility trailer for use on overnight field trips. Other non-motorized vessels (e.g., canoes) can also be checked out for use by students and faculty through the UTC Aquatic and Recreation Center.

BGE vehicles are kept in the parking lot behind Holt Hall, the three boats and utility trailer are stored off campus in a locked fenced facility located just off campus. It is a new location purchased by UTC for surplus storage and it is right next to the UTC Intramural Fields, 1110 Oak Street. Figure 5.1 shows the boat and trailers in storage status. The motorized kayak is stored in 110 Holt Hall, BGE's Mud Room. Additional boating safety equipment and tow hitch are also stored in the Mud Room.

Figure 5.1 BGE Boat and Trailer Storage



5.2.2 Construction Room

Over the years various faculty and students have constructed items to support teaching, field research, and research laboratories. Faculty typically supplied personal tools and constructed items in their research labs or outside in the loading dock area. Department faculty recognized the need for a dedicated space and tools and included a Construction Room in the Holt Hall Renovation plans. In 2021, the College of Arts and Sciences provided funds to purchase tools and equipment for the new room. Working with the Campus Safety Office and BGE Safety Officer, the Construction Room became operational in 2022. The room is now well-equipped with common shop items. Table 5.3 contains the list of available equipment.

5.3 BGE Construction Room Tools & Equipment

Hand Tools	250 Piece Mechanics Set (Kobalt) Hammer (16 oz Estwing) Dead Blow Hammer (Kobalt plastic 28oz) Vise (4") Pipe Clamps (2 2.5') Spring clamps (4) One Handed Bar clamps (2) Level Speed square (plastic) Square (aluminum) Staple Gun (Arrow), 5/16" and 3/8" Stainless Staples Hacksaw (12") Adjustable Wrench Set Screwdriver kit Channel lock pliers set
Power Tools (Corded)	Compound Sliding Miter Saw (DeWalt 12"), 2 General Construction Blades, 1 Metal/Plastic Blade Band Saw (Porter Cable Benchtop) Jig Saw (Bosch), jigsaw blade kit Drill Press (Wen Benchtop) 3/8 Hand Drill (DeWalt), Skil Drill/Driver Kit Angle Grinder (DeWalt 4.5"), 4.5" Abrasive Disks Bench Grinder (Delta) Random Orbit Sander (Bosch 5" 8 Hole), 80, 180, 220 grit disc sandpaper Belt Sander (Metabo HPT 3" x 21"), 3" x 21" 80 grit sanding belts Shop Vacuum (Craftsman 12 gallon) Air Compressor (California Tools Quiet 10 Gallon Portable), 50' air hose, attachment kit 50' 14/3 Extension Cord 25' 12/3 Extension Cord
Power Tools (Battery)	DeWalt 6 Tool 20V Combo Kit Impact driver Reciprocating saw, blade kit Circular saw (6.5"), 2 blades Oscillating tool, 3 blade kit LED work light Charger Two batteries Tool bag
Benches and Shelving	Tool Bench with Light and Peg Board (Kobalt 45" L x 24" W x 62.5"H) Work Bench (Kobalt 72" L x 24" W) Portable Miter Saw Stand Wire Shelves (DeWalt 3-shelves, 49" L x 18" W x 48" H) Wooden Work Bench (8'L x 4'W) Steel Cabinet
Safety Gear	Safety Glasses N95 Respirator Masks

	Ear Plugs Earmuffs Leather and rubber gloves First Aid Kit

5.2.3 Environmental Growth Chambers

UTC was awarded funds from the NSF Major Research Instrumentation program in Fall 2013 (Award # 1337530) to support the acquisition of six controlled-environment growth chambers to strengthen its active faculty scholarship, experiential graduate and undergraduate research opportunities, and involvement in community outreach. The growth chambers specifically support faculty research agendas requiring precise and simultaneous environmental controls with focus on global change biology at UTC. Projects completed to date have aimed to help elucidate the role that local adaptation could play in plant species migrations in response to climate warming and provide information about how imperiled eastern hemlock will respond to climate change within the context of hemlock woolly adelgid invasion. More recent NSF-funded research (Award #1655762) aims to improve understanding of species rarity by assessing the ability of rare endemic species to adjust to rapid environmental changes compared to closely related species that are more common. By enabling faculty to conduct year-round campus-based research and consequently integrate more ongoing research into their sizeable teaching duties, the growth chambers have increased research productivity while fostering student research training and experiential learning. In the past five years, ~50 UTC undergraduates have been engaged in research using the growth chambers during lab-based coursework (primarily in Plant Ecology, BIOL 4450, ESC 5450). Because almost 70% of BGE majors are women and 31% represent racial or ethnic minorities, participation of these students in research has been inherently broadened by teaching applications of the chambers. In addition, the growth chambers have supported the research of two students enrolled in the MS in Environmental Science Program at UTC, two undergraduate students conducting Departmental Honors (DHON), and an additional 29 students mentored in individualized research experiences. About 85% of these students are women, and 15% represent racial and/or ethnic minority groups. Research conducted in the chambers also has supported collaborations between UTC faculty and faculty at the University of Georgia, University of Oxford (UK), Austin Peay State University, and Seton Hill University, as well as collaborations between UTC and the U.S. Fish and Wildlife Service.

5.2.4 Greenhouses

The department has access to two greenhouses. One greenhouse adjacent to Holt Hall is for general use and provides a wealth of teaching material that is used in multiple lectures/labs in these courses and from plant anatomy, morphology, evolution to pollination syndromes, growth and development, water use strategies (xerophytes vs mesophytes), and more. Greenhouse activities specifically support and strengthen our programs by providing plant materials and space that is used in many different laboratory sessions of different courses including Plant Physiology, Plant Morphology, Taxonomy, Biogeography, and Cell Biology. In addition, there is space for many other activities including plant research under controlled environmental conditions, medicinal, and other plant collections. The second greenhouse is located a block from Holt Hall and is devoted to the American Chestnut Restoration Program.

5.2.5 Teaching and Learning Urban Garden

Since its inception in May 2016, the Teaching and Learning Garden has thus far had a great impact on our students and the community. The Urban Gardening courses (BIOL 1140 and BIOL 4370) are taught every semester, and open to any UTC student. The courses provide opportunities for active experiential learning. All activities of the course are spread between two field plots: a larger plot of 636 m² contiguous to Holt Hall and a smaller plot of 120 m² across the street from Holt Hall and contiguous to the

Challenger Center. In addition, the greenhouse contiguous to Holt Hall is fully dedicated to supporting activities of the urban gardening course and the garden. Students use this facility for seedlings production during winter and maintaining the germplasm collection of some tropical and medicinal plants. More detail about student learning related to the garden can be found in **Section 3.2.5**.

5.2.6 Collections of the Natural History Museum

The museum holds a collection of fossil vertebrates and invertebrates numbering several thousand specimens (including 1,102 catalogued mammals, 250 catalogued birds, 42 catalogued reptiles & amphibians, more than 500 invertebrate specimens, with approximately 3,000-4,000 uncatalogued specimens), and an extant vertebrate teaching collection of more than 500 specimens (216 whole body, whole skeleton, or mounted or preserved dissected specimens and models, roughly 300 microscope slides [chicken embryos, protochordates and misc. histology slides], and ~100 miscellaneous, isolated bones). Additional details of collections are provided below.

- **Mammal Collection:** The UTC Natural History Museum mammal collection, which is curated by Dr. Tim Gaudin, includes 2,438 catalogued specimens, representing 226 species in 84 families and 25 orders (i.e., all but three of the living mammalian orders). Based on a 1997 survey [Hafner, M.S., Gannon, W.L., Salazar-Bravo, J. and Alvarez-Castañeda, S.T. 1997. Mammal collections in the Western Hemisphere. Lawrence (KS): American Society of Mammologists], the mammal collection would be the second largest in the state of Tennessee and is positioned at the opposite end of the other significant mammal collection in the state at the University of Memphis. The mammal collection serves as an official repository for specimens collected in biotic surveys of two national parks (Chattanooga/Chickamauga National Battlefield and the Great Smoky Mountains) and includes significant collections of specimens from east and southeast Tennessee, northwest Georgia, and western North Carolina. Its taxonomic strengths are in small terrestrial soricids and rodents. These collections are used in the Comparative Vertebrate Zoology course (BIOL 4050, 24-48 students per year), the Mammalogy course (BIOL 4140, 24 students every two years), and the History of Evolutionary Thought course (BIOL 4550, 10 students every two years). We are currently in the process of uploading the collection data to the public database SYMBIOTA, so that it will be more broadly available for use in the scientific community.
- **Insect Collection:** The UTC Insect collection (UTC I), which is currently curated by Dr. Stelios Chatzimanolis, was established in the early 1970s by Charles Nelson, a Plecoptera expert. Over his 30-year career, Nelson developed an outstanding teaching collection (identified at the family level), with representatives from most Southeastern (SE) U.S. families and approximately 40,000 specimens. Chatzimanolis arrived at UTC in 2008 and quickly established a modern research-focused collection of Coleoptera, which currently has an additional ~45,000 specimens. Six new modern cabinets were acquired and dozens of Cornell drawers to rehouse the teaching collection and make room for the developing research collection. The main geographical focus of the research collection is the SE USA but due to the neotropical research program of Chatzimanolis, many neotropical materials are present as well. In fact, the collection has specimens from 40 different countries, excluding the U.S. Chatzimanolis' research focus is the largest family of animals, the rove beetles (with >60,000 species described) and the UTC I collection is quickly becoming one of the more diverse rove beetle collections in North America. The Xanthopygina rove beetle collection at UTC I is one of the top 10 in the world, regarding species diversity present in the collection. Because Chatzimanolis is the only rove beetle systematist currently employed in the U.S. at a university level, UTC I is also becoming the de facto collection for rove beetle specimen identification in the country. Recent donations of materials include 5,000 specimens of rove beetles from Arizona and 2,000 specimens from Paraguay. The UTC I collection is extensively used in BIOL4070 (Entomology), 24 students/year, BIOL4130 (Invertebrate Zoology), 24 students/year, and BIOL4085 (Parasitology), 24 students/year.

- **Amphibian and Reptile Collection:** This collection includes 5,000+ specimens, including ~2,000 species, 239 genera, and 78 families (of the 153 recognized), which does not account for a backlog of un-accessioned specimens. Of note, the oldest specimen in the collection from our region is *Regina septemvittata* (Queen Snake) Kenton Co. Kentucky, R.S.W. (Gift from GMU1998/UKR381). The taxonomic focus of the collection is variable but focused on Caudates, Chelonians, and Colubrid snakes. Like the taxonomic focus, its geographic focus is also variable. This collection is utilized by the following courses and students: BIOL 4090 (Herpetology), 24 students; BIOL 5400 (Special Topics), 2-4 students; ESC 3400 (Environmental Survey Methods), 24 students; BIOL/ESC 4995/4998/4997 (Team Salamander), 8-12 students every semester; BIOL/ESC 4512 (Amphibian Ecology and Conservation), 24-30 students, and Comparative Vertebrate Zoology course (BIOL 4050), 24-48 students.
- **Bird Collection:** The bird collection in the UTC Natural History Museum consists of approximately 250 bird specimens and about two dozen nests, representing 106 species and 36 families. Notable specimens include the first North American inland record of Great Shearwater (*Puffinus gravis*) and the 6th Tennessee record of Snowy Owl (*Bubo scandiacus*). The collection is used primarily for BIOL 4710 (Ornithology), which has a limit of 24 students. Some specimens are occasionally used by BIOL 4050 (Comparative Vertebrate Zoology).
- **Fish and Additional Invertebrate and Salamander Collections:** Details of the collections previously managed by Dr. Mark Schorr are provided in Table 5.4. In summary, this collection contains numerous invertebrates, fish from more than 110 families, and more than four species of salamanders.

Table 5.4 An overview of the collections previously managed by Dr. Mark Schorr.

	Drainage	Watershed(s) or project	Year(s) of collection	Specimens	Families	Genera	Species
Invertebrates ¹	TN	NCCP ³	1996-97 ³	?	≥30	≥44	
Invertebrates ¹	River TN	USP/multi. ⁴	1998-2000 ⁴	?	≥76		
Invertebrates ¹	River TN	SRP, multi. ⁵	2012 ⁵	?	≥37		
Invertebrates ¹	River TN	Lookout Cr	2014	?	50		
Invertebrates ²	River multiple	multiple	multiple	?	?		
Ichthyological ¹	multiple	multiple	multi-year	?	?		
Ichthyological ²	multiple	multiple ^{3,4}	multi-year ^{3,4}	?	≥110		
Salamanders ^{1,2}	TN River	NCCP ³	1996-1997 ³	~20	1	4	≥4

¹research/reference collection(s), which contain site- & date-specific information, are used primarily by researchers or professional biologists; however, many of the reference specimens are used for teaching.

²teaching collection(s), which may or may not contain site- & date-specific collection information, are used primarily for teaching.

³“North Chickamauga Creek Project” (NCCP) -- Site- specific location information is detailed in the following literature: Schorr, M.S., C.H. Nelson, and G. Van Horn. (1997). Ecological assessment of streams impacted by acid mine drainage in the North Chickamauga Creek System, Tennessee, and an evaluation of the mitigation potential of constructed wetlands. Contract Number ID-6-05876-6-00. Annual Report. Tennessee Wildlife Resources Agency, Nashville, Tennessee, 72.

⁴“Urban Streams Project” (USP) -- Site-specific location information is detailed in the following literature: Schorr, M.S., E. Crews, P. Freeman, J. Long, P. Johnson, and D. Fritz. (2001). Assessment of water quality and aquatic macrofauna in Chattanooga area streams. Contract No. R04101154-64. Final Report. City of Chattanooga, Department of Public Works, Stormwater Management Section, Chattanooga, Tennessee, 444.

⁵“Stream Restoration Project” (SRP) – Site-specific location information is detailed in the following literature: Schorr MS, Carroll A, Cuervo J, Freeman PL, Genard L, Geren D, Ghazi H, Hubbuch JM, Landis L, Smith JB. (2013). Macrofaunal responses to habitat improvements in two urban streams in Chattanooga, Tennessee. Final Report. The City of Chattanooga, Department of Public Works, Water Quality Program. Chattanooga, Tennessee, 115.

- **Herbarium:** The herbarium at UTC (UCHT) is the oldest herbarium in Tennessee. Established in 1886 and with several hundred specimens from the early 1900s, today it houses >46,500 specimens with at least another 7,000 in preparation. UCHT’s specimens are digitized and contribute to state-level, regional, national, and international biodiversity data portals. There are specimens from all 50 US states and many of our National Parks (NP), including Mt. Rainier NP, North Cascades NP, Olympic NP, Grand Tetons NP, Yellowstone NP, Yosemite NP, Rocky Mountains NP, Zion NP, Bryce Canyon NP, and Grand Canyon NP. Our herbarium is also international in scope with specimens from Africa, the Middle East (Abu Ghraib, Iraq), Europe, and Southeast Asia. UCHT is an official repository for the Chickamauga and Chattanooga National Military Park. While it is hard to put a monetary value on specimens, averaging a couple of published estimates and adjusting for inflation since the late 1990’s would value the UTC herbarium at about \$4.5 million. It is used to support Plant Morphology, Plant Taxonomy, Field Botany, and Biogeography, and it could support more classes. Dr. Shaw frequently has a lab of 3-6 MS and several undergraduate students each semester who all use the herbarium in their research. It is an education resource as well as a repository for voucher specimens that give life to published studies dating back generations in BGE.

5.2.7 Computers

A detailed list of departmental computers is provided in [Appendix 5-C](#). The department has acquired approximately 49 computers in the past five years through department, college, university, and grant funds. UTC Information Technology provides support for these computers and initiated a Computer Refresh Program in 2016. The Computer Refresh Program was established to create an annual cycle of computer replacement so that all faculty and staff would receive a new, primary computing device every four years. The university refresh fund contributes up to \$1,400 toward a refreshed device with departments paying for any overages. Prior to this, computer refresh was ad hoc. The university additionally provides a range of relevant software and cloud access, including Microsoft Office Suite, Adobe Pro and Adobe Create Cloud, ArcGIS Pro, AutoCAD, EndNote, Maple, MatLab, Qualtrics, QuestionPro, SAS, and SPSS.

5.2.8 Field Stations

The department oversees the operations of five Biological Field Stations (BFS). The BFS are in the Ridge and Valley ecoregion, and their underlying geology is dominated by limestone and dolomite formations and rolling hills. The BFS properties are comprised of five distinct parcels.

- Enterprise South Upland (35.100° N, -85.104° W, 77 ha)
- Enterprise South Wetland (35.105° N, -85.138° W, 37 ha)
- UTC Aquatic Laboratory (35.054° N, -85.284° W, 0.24 ha)
- Wisdom Street Wetland (35.081° N, -85.260° W, 2 ha)
- TVA Test Track Wetland (35.099° N, -85.239° W, 1 ha)

The landscapes are a mix of hardwoods and conifers, and all are proximate to various water sources. The wetland habitats stay wet all year-round, but water levels vary with precipitation. The upland and aquatic landscapes at the BFS create habitats for 43 species of amphibians and reptiles, 50 species of birds, and 40 species of mammals. Infrastructure at the BFS includes two outdoor classrooms as well as permanent study plots, transects, drift fences, a small weather station, and boat storage. This infrastructure provides a framework for training students on basic field techniques, as well as for conducting research. The Enterprise South sites are about a 30–40-minute drive from UTC, while the other sites are within a 20-

minute drive from campus. Human encroachment from residential and industrial areas is occurring along the borders of some of the BFS properties, resulting in some habitat degradation (e.g., trash) and security issues in the outdoor classrooms. In addition, the travel time to and from the Enterprise South sites makes it challenging to use them for any labs that are only two hours long. Another reported problem at Enterprise South is the need for multiple keys to access the different sites, which makes it cumbersome to use those areas. The fact that we try to limit the number of keys creates a barrier for many students to go to those sites for class (e.g., students must collect plant specimens for plant taxonomy) or for graduate research.

5.2.9 Health and Safety

A chemical hygiene plan for the department is provided in [Appendix 5-D](#). The university also maintains an Office of Safety and Risk Management, and details of their activities can be found at the following website: <https://www.utc.edu/safety-risk-management/emergency-management/index.php>.

5.2.10 Library

UTC has a state-of-the-art library that provides access to 400,000+ print and online materials, relevant databases, and discipline-specific journals. All items are available to current UTC students, faculty, and staff for check out and many resources can be accessed online from home via the library catalog, which can be searched from their homepage at <https://www.utc.edu/library>. The library provides access to information in every format available from books, e-books, audiobooks, and journals to online databases, digital image collections, CDs, and DVDs. Inter Library Loan (ILL) is highly effective at getting resources that are not owned by UTC. Articles are usually shared within 24 hours in PDF format. Book and other hard copy documents arrive within 3-7 days. The Library Studio can help with various technological needs. The space has an audio suite, video/photography suite, 3-D printing, and media tables. Students and faculty can also check-out equipment such as professional cameras, GoPro's, camcorders, camera lenses, external microphones, gimbals, stabilizers, recorders, recording cubes, lighting, backgrounds, tripods, music and recording gear, presentation gear (projector, speakers, screens), power stations, and portable disk drives. The Library provides access to small and large study rooms, a computer classroom that can be reserved for instructional purposes, presentation rooms, and conference rooms. Chapel Cowden, one of the library faculty, is assigned as our liaison. She regularly visits the department and reaches out about resources available for the sciences. She can also provide instruction and research support. The Library also offers a program called Affordable Course Materials Initiative (ACMI). This yearly grant support helps faculty identify electronic resources to use for their classes. The library will either purchase e-materials to be linked online or help faculty find other available OER resources.

5.2.11 BGE Study Rooms

We have three study rooms that are open (meaning the doors are not locked). Two are in Holt Hall on the second floor. In addition to comfortable study space and group areas, one of the rooms has a refrigerator, microwave, and sink. The rooms also have a television that can be connected to student computers for group work. A third study room is available on the second floor of Grote. The space is a Map Room for the Geology majors but has a table and other amenities. We also have a graduate student lounge that has swipe card access. This is a dedicated space for graduate students and has similar amenities to the open study rooms. Finally, there is a graduate student office area that is used by the Graduate Teaching Assistants. They hold office hours there and meet with students. There are also several computers and a printer so that the GTAs can develop materials for the labs.

5.2.12 Teaching and Research with Vertebrates, Human Subjects, and Biohazardous Materials

The Office of Research Integrity manages the Institutional Review Board (IRB), Institutional Animal Care and Use Committee (IACUC), and the Institutional Biosafety Committee (IBC). Both IACUC and IBC are chaired by faculty from BGE. The process for securing approvals is detailed at the following links

- IRB: <https://www.utc.edu/research/research-integrity/institutional-review-board>
- IACUC: <https://www.utc.edu/research/research-integrity/institutional-animal-care-and-use-committee>
- IBC: <https://www.utc.edu/research/research-integrity/institutional-biosafety-committee-ibc>

5.2.13 GIS Resources

The BGE Computer lab in Holt 399 has 24 desktop computers with ArcGIS Pro and the Geology student lounge has five desktop computers with ArcGIS Pro and ERDAS Imagine. BGE faculty also use a computer lab in 540 McCallie Building that has 40 computers with ArcGIS Pro, ERDAS Imagine, and Google Earth. The Interdisciplinary Geospatial Technology Lab (IGTLab) provides a variety of GIS resources and support services for the university community, including an ESRI site license, ESRI Virtual Campus Courses, Trimble site license, 2+ TB of regional geospatial data, Enterprise geospatial data server, Web mapping development and hosting, Mobile GIS application development, Survey and map-grade GPS equipment, on-call support by certified GIS Professional, and lab and classroom instruction. The IGT Lab has 24 desktop computers with ArcGIS Pro, ERDAS Imagine, and Google Earth. Finally, students can install ArcGIS Pro and ERDAS Imagine on their laptops and/or personal computers for class and research use for free. Both Dr. Hossain and Dr. Wilson have research GIS resources including high performance computers, large screens for data visualization, iPad for field use, and additional software including Resonon Hyperspectral Software, and EPA's BASINS.

5.3 Assessment of Learning Resources Strengths, Weaknesses, and Recommendations for Change

5.3.1 Equipment and Facilities

5.3.1.1 Instructional Equipment

The Chair of the Equipment Committee, Jessica Sanders, has evaluated our equipment needs. The department is not in dire need of any major equipment at this time but could benefit from a few equipment upgrades. The computer lab in Holt 399 holds 24 desktop computers that are approximately 5 years old. Due to their age, software programs that are required for certain courses (GIS, Remote Sensing, etc.) run slowly. The Geology department could also use more storage space for its rock, mineral, and fossil collection.

5.3.1.1 Teaching Labs

In the *Principle of Biology Labs*, the space is designed for student success. Each student has an individual workstation. Due to the capacity, they are limited to 24 students, which ensures more focused learning. The labs are equipped with enough microscopes (many new) for each student. There are currently microscopes behind the instructor's bench that can be linked to the main display. New balances should be purchased to make sure that each group in the lab has its own balance; currently groups are sharing the balances available. The renovation did not include new cabinetry or benches. As a result, some of the drawers do not easily open and the microscope cabinets are old and damaged. Ideally, they should be

replaced. In Holt 224 (BIOL 1120L), it would also be ideal to have a stereomicroscope that would be compatible with a camera to show students specimens that are larger than what can be shown on a compound microscope. Holt 224 could benefit from a refrigerator. This would be used to store dissected specimens over several days. That way the specimens would not dry out and could be used over multiple days.

The *Introduction to Environmental Science Labs* are also designed for student success. Tables are aligned facing the faculty podium and students have their own station. In terms of equipment, in ESC 1500, there is always a need for more balances, which would make it possible for students to work more independently as opposed to having to calibrate their pipettes (and do other exercises) with a lab partner. There is great benefit in working in partners and groups, but it has been observed that when working with other students, some students are content to let the stronger students take the lead, with the result being that not everyone learns how to do all tasks equally or to the same level of competence. Additionally, more professional-level water quality monitoring instruments (some Hydrolab Quantas, for example) would be a strong addition to our current stock of laboratory equipment and supplies, especially for ESC 1510 laboratory.

Anatomy and Physiology Labs have had recent technology upgrades that have improved presentation options. This was supported by both online fees and lab. However, there are some concerns that may not be able to be addressed due to space limitations. We continue to teach more students each semester, even with limitations. Designated storage space is needed in both Grote 108 and Grote 109 for models, equipment, and chemicals. Due to location, the acoustics in the anatomy lab in Grote 108 and 109 are difficult. Ceiling panels may help this situation. The ventilation system for the building is exposed and often generates extra noise, making it difficult for students at the back of the rooms to hear their instructions because of the poor acoustics and excessive noise. This ventilation system also has a condensation problem which has not been fixed in the 13 years we have been using this space in the building. We have had almost constant tickets with facilities about this issue. Additional or improved lighting in the labs is needed to improve the students' ability to see structures during dissections. The current lighting arrangement creates large shadows that are difficult to avoid when working on the benches. These shadows become especially problematic when students are attempting to locate and identify various muscles, organs, and vessels on their specimens. The labs are lacking in hot water, which is a safety concern for students who need to wash their hands and clean dissection pans and utensils.

The *Microbiology Labs* are isolated in the building (third floor, west end of the building). For biosafety reasons, this is ideal. The labs are near the Microbiology Prep Space and the two autoclaves. Students have the biosafety equipment needed to participate in lab safely. Students serve as teaching assistants in the prep lab. As a result, there is frequent turnover (due to graduation). To help with this problem, we have hired a new assistant in the spring semester to be trained by experienced teaching assistants. The lab coordinator has a full-time teaching load therefore it would be beneficial to hire a full-time Microbiology Prep Technician. This would eliminate the need for four student assistants and constant training and make the role of the coordinator less demanding in terms of supervision and physical involvement in task accomplishment. The coordinator would then collaborate with the technician to achieve the goals of the lab and would still have room to hire student assistants. Another area of improvement that has been discussed for years is the potential implementation of laboratory exercises that utilize molecular methods; however, the lack of equipment/funding means this has not yet been possible.

As Table 5.3 clearly shows, many *Geology Laboratories* are currently being used for both teaching and research activities. Since the last program review, two new lab spaces have been added for faculty research. Grote 113 was renovated as a Biogeochemistry lab which is shared between Dr. Manning-Berg and the hydrogeology faculty. Holt 324 houses the Rock Preparation Lab which is used by new faculty member Dr. Taylor. The addition of these lab spaces is significant because Geology did not have assigned

lab spaces for faculty prior to the merger. Facilitating research by assigning dedicated laboratory space to Geology faculty is a positive direction for the department.

The GIS and Remote Sensing programs have grown in recent years. BGE offers one introductory and four upper-level advanced undergraduate GIS and Remote Sensing classes for BS Geology and BS ESC degrees and a minor in GIS. BGE also offers four graduate level GIS and Remote Sensing classes for the ESC Master's program that are cross listed with the undergraduate courses. Currently all GIS and Remote Sensing classes are primarily being held at the Integrated Geospatial Laboratory (IGT), which is about a 15-minute walk from the department (on the other side of campus). The lab has the bare minimum computing facility for GIS and Remote Sensing classes as the computers are old. The lab also has restrictions for after-hours use. The availability of a classroom with efficient computing facilities within the department or in close proximity would be of great benefit by providing an optimum learning environment for GIS and Remote Sensing classes. The computer lab in Holt has only 24 computers and they are not fast enough to handle all that is needed. A request has been made for funds from the college to replace the computers, but that is pending.

5.3.1.2 Research and Other Facilities

Since the completion of the Holt Hall renovation, there has been a significant increase in overall space, primarily for use by Biology and Environmental Science faculty. All Biology and Environmental Science research faculty have dedicated research/storage space, and many have increased and improved space post-renovation. More space has been identified in Grote for Geology research, but a continued need for Geology will continue to be independent research space, as mentioned. There is not any surge space currently, but half of two different research labs in Holt. All office and research spaces are designated for current faculty or searches that are in progress. If there are any Geology tenure-track hires due to growth, there is not any space in Grote for that expansion. Thus, while the building renovation has improved our space, the department may soon require additional space.

5.3.2 Other Resources to Support Teaching and Learning

- General use vehicles: There are no major needs for general use vehicles at this time, however, should the department van or truck need to be replaced, there are no funds available for purchasing a new vehicle.
- Growth Chambers: No major needs are noted with respect to the growth chambers currently. Annual maintenance costs are about \$3,000 and are covered by the department.
- Greenhouses: The greenhouses need storage facilities for materials including pots, tools, equipment, and chemicals. In addition, a greenhouse manager that could free faculty from being the caretaker of the structures would be beneficial. Ideally, the greenhouse manager would be a student to increase paid student opportunities. Currently the greenhouse functions as what it is intended for (greenhouse), but also as storage place which deters taking advantage of its full capacity. As far as needs for the greenhouse, natural history collections, and the herbarium we are pushing to start thinking about these as pieces of equipment. Like any other teaching/research tools, they need maintenance and upgrades to keep them useful and functioning. These are valuable resources that span several professors, classes, and students, and they support and underlie publications, environmental impact assessments, and grant funding. As such, they need maintenance. However, there is no dedicated budget for any of this. Even more, the collections and greenhouse require constant attention (watering, weeding, repotting, monitoring dermestid. Ideally, BGE needs a new state of the art greenhouse to keep up with advances in technologies and new plant production techniques. Refurbishing what we currently have could improve conditions for research and teaching but will still be far from what would be desirable for a school like UTC. It would be desirable to create a facility where key activities such irrigation, light control, and climatization were computer programed and controlled. This adds up to

considerable time of curators of these resources. At the very least, even small, dedicated budgets would help protect and maintain these valuable resources.

- **Urban Garden:** The needs to improve the Urban Gardening program include a dedicated storage facility for the small garden tractor, tillers, and other equipment. In addition, the acquisition of irrigation systems for the area is a high priority for the urban garden.
- **Natural History Museum Collections:** Lab fees have allowed for the purchase of additional storage and curation supplies. We have also used lab fees to pay graduate students to help curate the collection. Major weaknesses in the museum must do with a lack of labor and lack of a dedicated budget for the museum to purchase supplies. This applies across the board for all the collections. We depend on students for all curatorial activity, but between preparing backlogged specimens, maintaining a dermestid beetle colony to clean skeletons, the actual work of cleaning skeletons, identifying, and labeling and databasing specimens, and specimen upkeep (including tasks like regular treatment for pest control, specimen repair, etc.), many tasks fall through the cracks. For the museum in general, we need dedicated collection/curatorial staff and dedicated. There is just enough time in a week for our faculty to direct students or complete the tasks themselves.
- **Computers:** Teaching computers are refreshed through IT's Computer Refresh Program. After the Holt renovation, Holt 399 was designated as the student computer lab. It holds 24 desktop computers but there is no current program in place to upgrade them after a certain period. New computers were requested in the Fall 2023 semester.
- **Field Stations:** Unfortunately, human encroachment is occurring along the borders of the BFS and is primarily residential or industrial in nature. Hence, the primary challenge, as of late, is increased security at the BFS. Security cameras would increase safety at all locations.
- **Health and Safety:** No immediate modifications are needed to our current health and safety protocols.
- **Library:** No major library needs are noted currently.
- **Research with vertebrate animals, human subjects, and biosafety:** The IACUC, IRB, and BSC work well with students and faculty to approve and monitor relevant research. However, the review process is often time consuming, particularly with IACUC and IBC. Because of this, and because revisions and re-review of the protocols are typically required, the review process can make it challenging for students to conduct vertebrate research. A more streamlined process would benefit both faculty and students.
- **GIS Resources:** The availability of a larger GIS classroom with efficient computing facilities within the department or in close proximity would be of great benefit in providing an optimum learning environment for GIS and remote sensing classes.

6 Support

The Department of Biology, Geology, and Environmental Science utilizes a single operating budget. Until 2015, the Geology Program was part of the Department of Physics, Geology, and Astronomy and had its own budget. Budgets for the Biology and Environmental Science Programs were also maintained separately. A decision was made in 2016 to merge all three budgets and treat them as one. Numbers presented below were gathered from IRIS (UT accounting system), BGE records, UTC Factbook, and the Office of Planning, Evaluation, and Institutional Research (OPEIR).

A UTC fiscal year (FY) runs July 1 – June 30, and it is referred to by the fiscal year of the ending date. For example, the academic year 2023-2024 is FY2024. While it is customary to split an operating budget into line items (e.g., student employees, travel, motor vehicle operation, printing, supplies, rentals, insurance, equipment) to better understand spending trends, we frequently redistribute funds as needed. BGE's allocated operating budget only accounts for about 14% of the total funds necessary to run our department, so it can never be an accurate representation of a line-itemed operating budget. Thus, we will focus on the Operating Budget, Salaries Budget, and Total Budget as aggregate totals with respect to faculty numbers, enrollment, and degrees conferred.

6.1 Program Budget and Needs

The combined Operating Budget for the Department of Biology, Geology, and Environmental Science has historically come from four sources: state allocations, monies from the College of Arts and Sciences (= "Budget Revision totals" in the tables below), lab fees, and gift funds. The first two sources each are about 51 % of the total operating budget for BGE. In 2007, we initiated a lab fee of \$25/lab course for all courses with labs. In Summer 2022, the Board of Trustees voted to approve an increase in the lab fee to \$50/lab course which was first applied in FY2023.

Table 6.1 summarizes the budget by category, Operating, Salary, and Additional Funds. The FY total for each category is included as well as the sum of all categories.

Table 6.1 BGE Budget Summary

Operating	FY19	FY20	FY21	FY22*	FY23*
State Allocations	\$117,000	\$117,000	\$117,000	\$117,000	\$117,000
CAS Revisions	\$ 5,311	\$10,557	\$16,141	\$78,767	\$104,320
Total	\$122,311	\$127,557	\$133,141	\$195,767	\$221,320
	Percent Change	4.3%	4.4%	47%	13%
Salary					
Total State Allocations	\$2,343,808	\$2,487,884	\$2,621,733	\$2,656,932	\$2,660,825
	Percent Change	6.1%	5.4%	1.3%	0.15%
Additional Funds					
Lab Fees	\$ 99,841	\$86,320	\$109,600	\$94,783	\$172,103
Gift Funds	\$75,697	\$ 41,512	\$47,508	\$45,113	\$37,398
FY Totals	\$2,641,657	\$2,743,273	\$2,911,982	\$2,992,595	\$3,091,646

*COVID Relief funds resulted in significant CAS Revisions in FY22 and FY23.

Within the Operating Budget, State Allocations were \$117,000 and did not change throughout the review (Table 6.1). Extra funds from CAS (Budget Revision totals) increased significantly during the review, from \$5,311 to \$104,320. This increase is attributed to COVID-19 Relief funds awarded to the university. Those additional funds allowed CAS to reallocate other funds to the college departments. In BGE, those funds were used to purchase a new SUV, a new boat, and numerous pieces of lab equipment. They were also used to fund research start-ups for new faculty. Moving beyond FY24, these funds will not be available, and we will return to small CAS revisions between \$5,000 and \$10,000.

Figure 6.1 graphically shows the total BGE Expenditures (Salaries, Benefits, and Operating) per SCH, per Student Major, per Degree Conferred, and per FT Faculty FTE. All divisions and degree types are included in this data as faculty members teach classes and students enroll in classes across all divisions and degree types. With the log scale, it may be difficult to note much change. Between FY19 and FY23, the increases across the categories were 1% per FT Faculty Member FTE, 31% per Student Major, 13% per Degree Conferred, and 16% per SCH. Based on this information, the large increases are attributed to the addition of faculty between FY19 and FY23. FT Faculty FTE went from 31 to 36 during that time, which increased our expenditures due to salary and start-up costs. The added expenditures for faculty make a marked change on the other categories. There were raises across the board during that time, ranging from 0% to 3%, which would increase the salaries of all employees. Table 6.2 includes these increases.

Figure 6.1 Log scale of Expenditures per SCH, per Student Major, per Degree Conferred and per FT Faculty FTE from FY19-FY23.

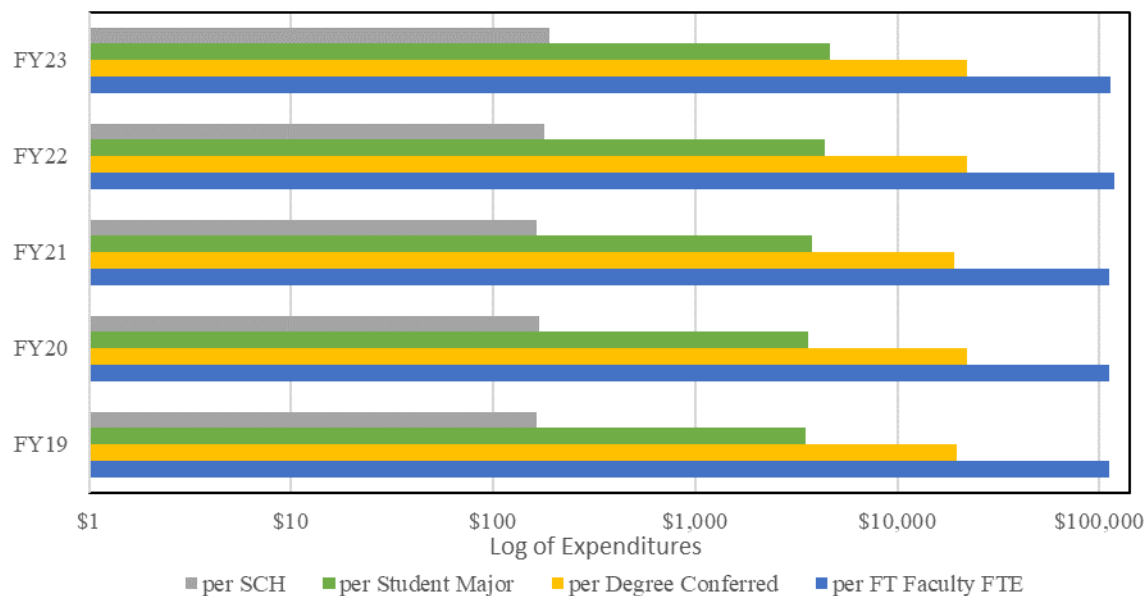


Table 6.2 includes the data from Figure 6.1 along with the annual pay raises, FT Faculty FTE, and the actual expenditures. Over the review period, the expenditures increased by \$595,134 and the FT Faculty FTE increased by five faculty.

Table 6.2 FT Faculty FTE and Expenditures per FT Faculty FTE

	FY19	FY20	FY21	FY22	FY23
Across the board raises	2%	2%	0%	2.75%	3%
FT Faculty FTE	31.00	33.00	33.00	33.00	36.0
Actual Expenditures	\$3,465,746	\$3,676,687	\$3,660,418	\$3,876,787	\$4,060,880
Expenditures/FT Faculty FTE	\$111,798	\$111,415	\$110,922	\$117,478	\$112,802
Expenditures/Student Major	\$3,518.52	\$3,618.79	\$3,781.42	\$4,370.67	\$4,609.40
Expenditures/Degree Conferred	\$19,580.48	\$22,148.72	\$19,064.68	\$22,027.20	\$22,190.60
Expenditures/ SCH	\$164	\$167	\$164	\$178	\$190

In addition to the Operating Budget, BGE has income through lab fees and gift funds. In FY23, the lab fee was raised from \$25 to \$50, and it significantly impacts our ability to service the labs. The Operating Budget increased by 72.3% from FY19 to FY23 because of these fees. It is important to note that, even with 30-50% added to our base operating budget, it is still less than what is required to meet BGE's minimum budgetary needs. From another perspective, the state and university allocated budget, plus the lab fees only support about 74% of the minimum operating budget necessary to run a program that accounts for 7% of all degrees conferred at UTC.

Financial donations to the BGE general gift funds have remained unchanged during the review period. BGE has several endowed gift funds with annual revenues for awarding scholarships and managing unexpected service on equipment. Two new gift funds were endowed over the review period.

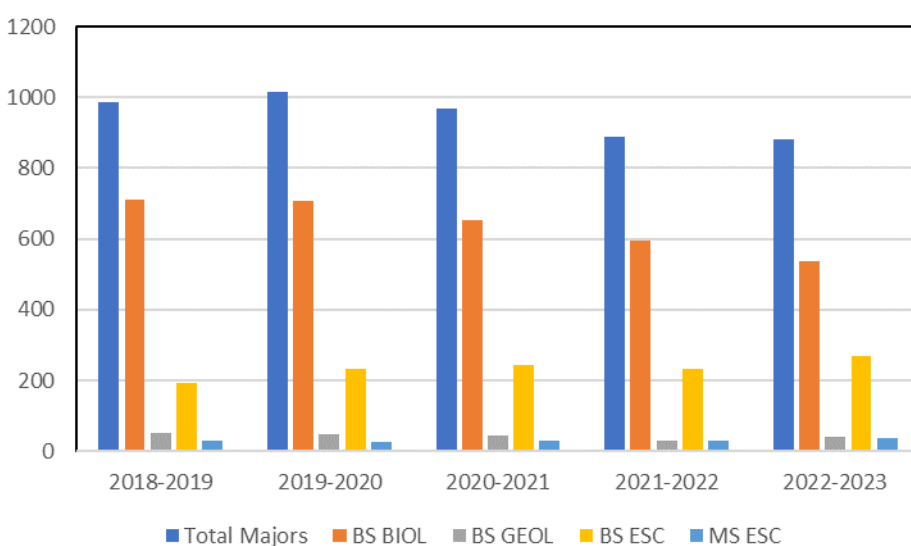
- Andrew Gamble Memorial Travel Fund: Endowed at \$50,000 in Fall 2022, specifically to support students who participate in the annual geology field experience course
- Dr. Mark Schorr Memorial Fund for Graduate Students: Endowed at \$25,000 in Spring 2023, specifically to support graduate student research, travel, scholarships, or the greatest needs for the graduate students in the MS ESC program

In FY19, the Total Salaries Budget of BGE was \$2,343,808 and in FY20 it increased to \$2,487,884 (Table 6.1). It increased by 6.1%, 5.4%, 1.3%, and 0.15% each year from FY19 to FY23. While these increases seem promising, they were due to faculty being added or promoted during this time, as well as annual across the board increases. We also lost some TT faculty who were replaced by visiting lecturers, and those salary savings were absorbed by the college. In 2019, we had 31 FT Faculty FTE. This increased to 36 FT Faculty FTE in 2023. The faculty additions since our last review have trended toward an increased number of non-tenure track faculty. In Fall 2018, there were 23 TT faculty and 7 NTT faculty. In Fall 2023, there were 23 TT faculty (two lines are currently being searched and filled by visiting NTT and adjuncts in the interim) and 12 NTT faculty (one of which is visiting and will be searched as NTT in the future). The increase in faculty has only occurred in the NTT category. The university funded several of the NTT lines from enrollment initiatives labeled as "15/4", which was an increase in tuition dollars generated from switching to a model where students are billed for 15 hours each semester when considered full-time (whether they take 15 hours or not). The total BGE budget for salaries is 13.5% higher in FY23 than it was in FY19, largely because of the additions of these NTT lines, annual across the board increases, adjustments for equity, and faculty who earned tenure and promotion.

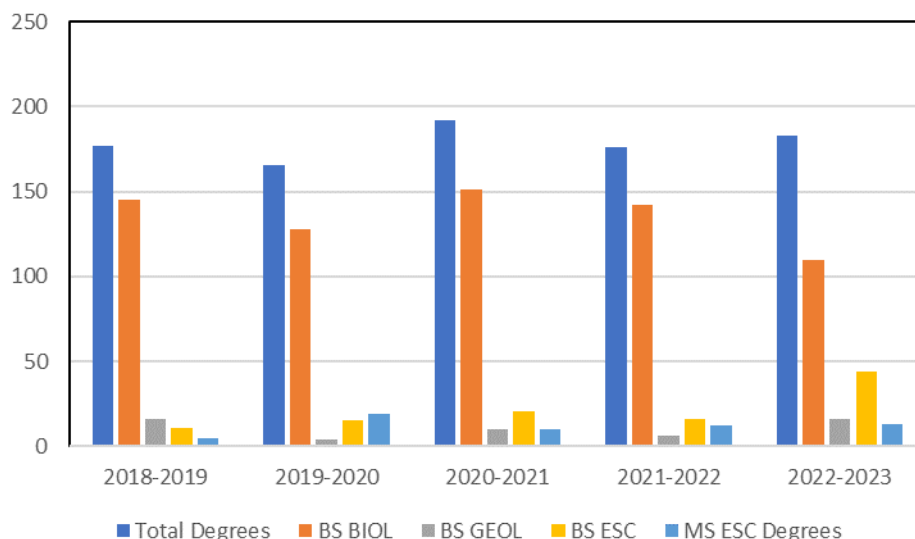
6.2 Program Enrollment and Graduation Rates

All the BGE programs have a history of enrollment and/or graduation rates sufficient to sustain high quality and cost-effectiveness. Through the early 2000s, enrollment in BGE remained stable, slowly climbing to 472 BGE majors in 2007. Following 2007, enrollment increased at a staggering rate of >12% per year through 2013 and resulted in 1,030 BGE majors that year. Enrollment leveled around 1,000 majors in 2013 and then gradually decreased. The decrease in majors occurred mostly in the BS Biology: Pre-Professional concentration. This decrease is attributed to improvement in pre-health advising, the creation of centralized advising, and retention efforts by UTC, as explained in **Section 0 Preface/History**. The enrollment in the BS Geology concentrations and MS Environmental Science concentrations has remained constant. The BS Environmental Science program has grown significantly. Figure 6.2 shows the trend in department majors for all tracks from 2018-2022.

Figure 6.2 Five-year trend of Enrollment, 2018-2022



The BS BIOL degree accounts for most of the degrees conferred as well as the enrollment changes over the last five years. There is also a significant increase in BS ESC degrees conferred over the last five years. MS ESC and BS GEOL degrees have remained constant. Figure 6.3 depicts the trend in the degrees conferred for each degree and the overall total.

Figure 6.3 Five-year trend of Degrees Conferred, 2018-2023

Over the last five years, UTC has had a 7% decrease in undergraduate enrollment and a 20% decrease in graduate enrollment. In comparison, BGE has had a 12% decrease in undergraduate enrollment, but a 20% increase in graduate enrollment. The department growth over the last review (2012-2017) was unsustainable due to the lack of increase in faculty and the facilities space. The slight decrease in total undergraduate majors has relieved some of the growing pains.

6.3 Program Responsiveness to Local, State, Regional, and National Needs

If the last century saw progress in physics, this century will be defined by progress in biology and environmental science. Great advances are continuing to be made through technology and these continually require new skill sets to be learned and applied. Our department is geared to claim this opportunity. Of the three programs of BGE, Biology is better known at all societal levels, from local, through to national. More citizens seek knowledge in Biology, as is explained by the growth in Biology majors from 2010-2018. We are also seeing marked interest in the Environmental Science major. The department is keenly aware of such needs and continues its endeavor to meet the challenge. Over the last couple of decades, the environmental concerns of the nation have grown (as has UTC's environmental science enrollment). Presently, global climate change is of great scientific and societal concern, and our Biology, Geology, and Environmental Science Programs are geared to accommodate such concerns. Additionally, our ESC program seeks to educate and make aware the next generation of leaders at both the global and local level and provide them with the technical and scientific skill sets they need to efficiently enact positive environmental change. As just one example, consider how the ESC program strives to prepare our graduates in computer-based technologies that can be used to study the environment. Several BGE courses offer students opportunities to learn GIS and remote sensing skills. The department also collaborates with the UTC IGTLab, which offers GIS and cartographic support for the UTC campus community and region for teaching, academic research, applied research, and planning. The program supports an NSF iCompBio REU in which students participate in a one-week computing bootcamp focused on essential data science using R, and advanced data processing and deep learning methods using Python. BGE faculty have also been supported by the internal Center of Excellence in Applied Computational Science and Engineering (CEACSE) grants supporting computational research. In short, our programs help meet the needs of our students and provide opportunities for students and faculty to address local, regional, national, and international problems.

The need to understand the Earth, its processes related to natural hazards, and the formation and distributions of its resources drives the education of students in the Geology Program, thus helping to solve problems faced by Earth's inhabitants today and in the future. For example, climate change and its effects can only be understood in the context of the whole Earth and its history; seismic hazards spur important and pressing research to better understand, mitigate, and publicize these hazards. The impact of environmental contaminants can only truly be assessed by understanding earth materials and how these contaminants move via pathways through these materials. Additionally, Geology's importance is fundamental in that the study of the Earth and other bodies of the universe are the foundation for all sciences, math, and engineering.

Conversely, Geology utilizes principles from all of these to gain a better understanding of how it works, something vitally important for current and future generations. The courses we offer build the foundation of knowledge needed for our students to solve these problems in their communities and at the state, national, and global level. Over the past five years we have produced students now employed with local environmental and geotechnical firms such as S&ME Inc., Terracon, Arcadis, AECOM, and Marion Environmental. We have students employed by the Tennessee Valley Authority, City of Chattanooga, Oak Ridge National Labs, Bureau of Land Management, USGS, and by the US Army Corps of Engineers. These and other graduates are utilizing their knowledge of geology and their critical thinking skills gained through the Geology Program at UTC to be better citizens and stewards of their communities. Our program is also responsive to national needs in producing more geoscience graduates to fill greater demand in the work force as expressed by the Bureau of Labor and Statistics on Geoscience job outlook at www.bls.gov/ooh/life-physical-and-social-science/geoscientists.htm.

"Employment of geoscientists is projected to grow 5% from 2022-2032, faster than the average for all occupations."

6.3.1 Program Responsiveness and the BES Curriculum

There have been several BES curricula revisions to help streamline the coursework required for the BS BIOL and BS ESC degrees. The number of concentrations in Biology and Environmental Science were simplified and all the courses were integrated into six categories in the path to degree: introductory, core, survey, cell and physiology, advanced ecology/evolution, and elective courses. Initially, this alleviated the persistent problem that arose when students needed specific courses for graduation and those courses were either not offered or already full. BES awarded 101 degrees in 2013, and in the four years following this overhaul, nearly doubled the degrees awarded to 188. The hiring of a departmental advisor skilled in resolving schedule conflicts and progression issues also likely contributed to the increase in degrees awarded.

Over the last five years, it has become evident that there continues to be problems with the BS BIOL curriculum. We struggle to offer enough spots to meet the needs of our students in the categories of survey, cell and physiology, and advanced ecology/evolution. This was exacerbated by the enrollment growth in BS ESC. These majors take the same courses but in different combinations. The department initially addressed these concerns by applying petitions (more than 1,000 per year) to help students progress to graduation. In Fall 2023, the BGE Department completed another overhaul of the BS BIOL curriculum that should alleviate some of the issues and reduce the number of petitions. We believe this change will immensely help progression to graduation without decreasing the rigor of the degree. Please review **Section 3. Curriculum** for specific details.

The BS ESC curriculum has similar issues as BS BIOL. These are due to growth in the number of majors (16% growth across the last year alone) and the limited spots in required courses. There is a plan to review the BS ESC curriculum in Spring 2024 and initiate changes through the curriculum process in Fall 2024. Specifically, ESC plans to take a hard look at the number of concentrations currently offered. Some reorganization will take place that will alleviate some of the pressure. There are also plans to offer a third

lab section of Introduction to Environmental Science II, meaning that we can expand the lecture enrollment, thereby better serving our swelling ESC population.

For all students in the BS ESC degree, there is now an increased focus on GIS. ESC students are required to take an introductory GIS course now as part of the ESC core (this course is taught by Dr. Azad Hossain and has been a great addition, given that it makes for more well-rounded, more competitive ESC majors once they enter the workforce). We also offer two upper-level tracks of advanced courses in GIS and remote sensing. The ESC Concentration entitled Geographic and Cartographic Sciences includes the advanced GIS and remote sensing courses, along with a specialized senior experience focusing on skill application. All these efforts produce graduates skilled in the spatial sciences; graduates who are more prepared to meet the demands of the workforce.

6.3.2 Program Responsiveness and the Geology Curriculum

The Geology program continues to update its program and provide expertise in geology relevant to students regardless of whether they decide to pursue graduate degrees or go directly into the workforce. Since the last review, the Geology program had three tenured faculty retirements that were filled by new assistant professor-level faculty. Dr Manning-Berg was hired to teach Sedimentary Rocks and Stratigraphy and Paleontology (replacing Dr. Annie Holmes). When Dr. Churnet (a petrologist) retired, his vacancy was re-worked to fill the need with a hydrologist. The program had not had a hydrologist in the past, but the faculty recognized the need for the specialty, and with the merger with environmental science, saw an opportunity for a more interdisciplinary position. With the hiring of a hydrologist (Dr. DeVries), Dr. Mies relinquished his role teaching hydrology and instead taught the petrology course that Dr. Churnet had instructed. In 2023, Dr. Mies retired, and the program gained Dr. Jennifer Taylor, a petrologist/structural geologist. In July 2023, Dr. DeVries left her position and the search for a hydrogeologist to fill her vacancy is in progress. Since the last review, we have also gained two new lecturers in the program. Tahmina Shirmeen was hired (a new line) as a lecturer to teach introductory-level geology courses. In 2020, Wayne Williams, who filled a staff position and taught all introductory labs, also retired. That position was filled by another staff position until 2022 when Katherine Ludwig was hired as a lecturer to teach the labs. In 2019, the geology faculty began the task of revamping their curriculum and in 2023, successfully implemented new changes that brought about three new concentrations. Their work was guided by the document Vision and Change in the Geosciences: The Future of Undergraduate Geoscience Education. Faculty started with addressing core competencies and skills and modifying current program learning outcomes to complement the desired competencies and skills. Major modifications included the addition of three new concentrations (Geospatial Science, Geoarchaeology, and Hydrogeology), modification of math and science requirements that are more flexible and determined based upon post-graduation goals, and faculty-student mentoring, and the requirement of a GIS course for the major. The new curriculum has been in effect for one year and only new first-year and transfer students fall under this curriculum. The faculty have already met this semester to discuss how things are going, what works, and what might not be working so that they can head off any major issues or glitches in the new curriculum.

Appendices

[Appendix 0-A](#)

[Appendix 0-B](#)

[Appendix 1-A](#)

[Appendix 1-B](#)

[Appendix 1-C](#)

[Appendix 1-D](#)

[Appendix 1-E](#)

[Appendix 1-F](#)

[Appendix 1-G](#)

[Appendix 1-H](#)

[Appendix 1-I](#)

[Appendix 1-J](#)

[Appendix 1-K](#)

[Appendix 1-L](#)

[Appendix 2-A](#)

[Appendix 4-A](#)

[Appendix 4-B](#)

[Appendix 4-C](#)

[Appendix 4-D](#)

[Appendix 4-E](#)

[Appendix 4-F](#)

[Appendix 4-G](#)

[Appendix 4-H](#)

[Appendix 4-I](#)

[Appendix 4-J](#)

[Appendix 4-K](#)

[Appendix 4-L](#)

[Appendix 4-M](#)

[Appendix 4-N](#)

[Appendix 5-A](#)

[Appendix 5-B](#)

[Appendix 5-C](#)

[Appendix 5-D](#)

Appendix 0-A

Campus Reintegration Plan Form

The University of Tennessee at Chattanooga

The purpose of this form is to document an established Reintegration Plan for each campus unit. Each unit head should utilize this form to submit a Reintegration Plan for their respective area for review and approval by their appropriate dean/major unit leader. The Office of Human Resources should be consulted as appropriate when establishing reintegration plans. Each Vice Chancellor should have final review and approval of Reintegration Plans for their respective division before forwarding this form to Human Resources for record retention at personnel@utc.edu. Unit Reintegration Plans should be established in accordance with the UTC Phased Reintegration Plan and University Health & Safety Guidelines.

Campus Unit(s): College of Arts and Sciences
Environmental Science

Division: Biology, Geology,

Unit Head: John Tucker

Date: June 12, 2020

The following sections may be used to guide administrators in establishing Reintegration Plan details that allow for incremental reintegration of personnel to the workplace to increase capacity and functionality in response to operational needs.

Phased Reintegration Timeline – Provide proposed start/end dates for phased reintegration based on anticipated operational needs.

- Phase I – May through June
- Phase II – July through August 7
- Phase III – August 10 forward

Unit Occupancy – Provide details related to personnel returning to the workplace, personnel continuing to work remotely, innovative/alternative work scheduling practices, and total unit occupancy.

- Phase I (May – June) – Staff and faculty requested to work primarily remotely. Faculty Associate, Accounting Specialist, and Department Head in Holt 215 as needed, typically 1 - 2 times per week. Several faculty and approved students working in Holt Offices and labs on research and course planning.
- Phase II (July – August 7) – Staff continue a mix of remote work and on campus work as needed. Staff presence increases over this time period to an eventual occupancy of about 50%. Faculty continue to primarily work remotely. Number of faculty working in Holt Offices and labs is expected to increase during this period but is not required. The plan will be revised if necessary to ensure BGE operational needs are met.
- Phase III (August 10 – forward) – Percentage of staff in Holt increases to between 50% and 100%, depending upon several factors (e.g. health risk factors and childcare). Percentage of faculty on campus will increase, with faculty teaching Face to Face (F2F) labs and lectures

required to meet classes. Other faculty will continue a mix of remote work and on campus work as needed. Some faculty will need to work remotely exclusively or primarily due to health risk factors, childcare, and similar reasons. At present, about 20% (8) of BGE's 40 employees have discussed a need to work primarily or fully remotely in the fall. Another 15% (6) employees have requested a mixed arrangement, with at least 4 of those related to childcare and dependent on Hamilton County public school arrangements in the fall. Accommodations discussed thus far do not impact the meeting of BGE operational needs.

- The plan will be revised if necessary to ensure BGE operational needs are met.

Alternative Workplace Design – Provide details related to planned reconfiguration of workspaces and common use areas to allow for appropriate social distancing and hygiene practices.

Departmental Front Office - The department administrative office (Holt 215 and associated rooms) houses four staff and the department head. Four individuals have private offices within Holt 215, but the Administrative Assistant and student workers do not. The Holt 215 complex consists of an open lobby area, four private offices, a copy/mail room, and a break room. There is daily traffic into Holt 215 (students, faculty, visitors, mail and equipment delivery, etc.) and occasionally high numbers of individuals with a line down the hall, creating a potentially unsafe environment. We will take the following actions to minimize risk in Holt 215.

- Normally we will leave the door open to Holt 215 to maintain a welcoming environment but will place a small desk in front of the doorway with a sign requesting that individuals other than faculty not enter until authorized.
- Move the Administrative Assistant's desk so she (or someone else in her absence) can monitor the entry way and

control access to the room.

- We have requested a plexiglass screen for the Administrative Assistant
- Close the front door when no one is present to monitor the front entryway to Holt 215 and post information about when the office will be open and alternate ways to contact staff or the department head
- Encourage students and others to make appointments ahead of time through an electronic scheduling mechanism
- Require persons entering Holt 215 to wear a mask
- Maintain 6 foot distancing between the workstations in the Holt 215 lobby area (Administrative Assistant desk, two student worker desks, table for display (materials, signup sheets, etc.)
- Limit mail/copy room occupancy to two people at a time
- Limit breakroom occupancy to one person at a time
- Post signs outside the door reminding people not to seek access if they have any covid symptoms
- Observe Hygiene and Health Monitoring practices described below

Other areas in Holt Hall

- Place floor signs at the entrance to every office, classroom, lab in our area to indicate six foot distancing.
- Limit number of individuals in teaching labs to 12 students plus one instructor or less, as

determined by BGE staff and approved by Academic Affairs and UTC Safety.

- Place tape in all teaching labs to indicate precise locations of student seats to maintain six foot distancing.
- Post signs requesting that individuals walk/stand on the right side of hallways and stairwells, walk single file, and maintain 6 foot spacing.
- Request that students not congregate outside classroom or lecture doors before and after class. They should remain outside the building, in cars, etc. prior to classes.
- Close or drastically reduce the number of allowable students in BGE's 3 student study rooms
- Faculty and staff leading meetings in any of our conference room or computer lab will be required to sanitize the room immediately after the completion of the meeting.
- Add additional tables to teaching laboratories to achieve 12 student workstations while maintaining 6 foot distancing. We have already accomplished this by obtaining tables from UTC Surplus and moving them into labs.
- Department meetings will continue to be conducted by Zoom or similar medium because of the lack of a room large enough to accommodate all faculty and staff and maintain social distancing and the limit on gatherings larger than 30 individuals.

Hygiene and Health Monitoring Practices – Provide practices to be implemented to ensure adherence to hygiene and health monitoring expectations outlined in the UTC Phased Reintegration Plan and University Health & Safety Guidelines.

- Follow all recommended and required university hygiene and health monitoring practices
- Wipe work surfaces, door handles, elevator buttons, faucet handles, etc., in common areas daily. Coordinate with facilities personnel to ensure all areas covered.
- Six feet (6ft) social distancing standards and proper protection/hygiene practices will be required for any faculty or staff members working in Holt Hall in accordance with CDC guidelines for prevention of illness and UTC Health and Safety Guidelines.
 - All faculty and staff will be required to wear a mask while outside their offices and during any meetings of two or more people.
 - Students and visitors to Holt Hall will be required to wear masks at all times.
- Common use internal doors will be left open whenever possible to minimize repeated contact with common surfaces. Coordinate this with UTC Safety.
- Faculty and staff will be asked to complete the COVID-19 Employee Self Questionnaire App and take their temperature each day before they come to campus. In the event they are symptomatic, they will be advised to remain at home and contact their physician.
- Students will be required to use disinfectant to clean lab areas before and after use
- Faculty and staff will be encouraged to self-isolate in the event of a known interaction with a COVID-19 positive individual and report the event to the Department Head.
- Provide disinfectant near all high use door areas, including entry/exit doors to Holt stairwell, or keep these doors open if possible. This will be coordinated with UTC Safety.
- We will restrict non-essential work-related travel.
- We will discourage all meetings where social distancing is not possible and encourage use of Zoom or other virtual platforms.
- Provide individuals with a disposable face mask if they show up without one.

Existing Operational/Business Needs or Fiscal Concerns – Provide details related to current needs or fiscal concerns associated with the phased reintegration plan outlined above.

100% face to face classes are largely impossible or impractical due to covid-19 classroom and laboratory seating limits. Nonetheless, we believe we can provide a quality academic experience for incoming freshmen and other students through a combination of online and F2F rotating classes.

There are several Business Needs/Fiscal Concerns that have a bearing on safety and the quality of courses and other academic experiences. Precise quantification of fiscal concerns is difficult in light of changing conditions, multiple uncertainties, and a likely minimum 20% reduction in the BGE operating budget.

- Delivery of quality online and F2F rotating courses/ academic experiences will require use of video/sound recording equipment in every laboratory and classroom, digital drawing pads, field video recording equipment, webcams, microphones, and other technology. We are relying on UTC to purchase and make this equipment available. If they do not, academic quality will suffer. The department is prepared to make some of these purchases with our limited budget, and more if additional money is provided.
- Purchasing, maintaining, and distributing adequate supplies of hand sanitizer, disinfectant, disposable face masks presents logistical and financial challenges. We understand that UTC will provide these items but believe it is prudent for BGE to purchase some of these items as part of our normal purchasing, especially for teaching labs.
- New floor, wall, and standing signage needs for Holt Hall are extensive. We are relying on UTC to purchase and provide appropriate signage but anticipate we will need to purchase some of these items.
- New equipment, models, and supplies may need to be purchased for some teaching laboratories to reduce the sharing of items and potential to transmit the virus. The full extent of this need will not be known until faculty redesign courses.
- New equipment, models, software, and licenses may need to be purchased for some teaching laboratories to facilitate remote learning. The full extent of this need will not be known until faculty redesign courses.

**Attach additional sheets if necessary*

Signatures of Approval

John C.
Tucker

Digitally signed by
John C. Tucker
Date: 2020.06.12

Department/Unit Head Date

Dean / Major Unit Head Date

Division Vice Chancellor Date

cc: Human Resources

Appendix 0-B

Biology, Geology & Environmental Science COVID-19 Related Safety Protocols for Teaching Labs

- 1. Capacities:** Teaching Lab COVID-19 capacities are 50% normal capacities + one instructor.
- 2. Face Masks:** All students and faculty are required to wear face masks at all times. The masks should cover both the mouth and nose.
- 3. Hand Sanitizer:** Upon entering and leaving the teaching lab, everyone should use hand sanitizer.
- 4. Disposable Nitrile Gloves/Hand Washing:** Students and faculty are encouraged to (should?) wear disposable nitrile gloves during the lab. If gloves are worn, emphasize the importance of not touching faces, otherwise the purpose is negated.
 - There are some circumstances in which gloves cannot be worn during a lab due to the lab activity. Under these conditions, students should wash their hands regularly.
 - (Gloves should always be made available to students and faculty within the teaching lab if students prefer to wear them)
- 5. 6ft Distance:** Students should maintain 6ft distance from each other while entering the lab and while seated.
 - Students can only sit in the designated areas.
 - It is understood that students and faculty may need to move & walk around in the room to use equipment, answer questions, etc. It is requested that this be kept to a minimum as much as possible.
- 6. Disinfecting work areas and equipment:** Both students and faculty are required to disinfect their work areas, chairs and equipment upon entering and before leaving the teaching lab.
 - Shared equipment: There could be times that students will need to use the same equipment during a lab period. Under these circumstances, the equipment should be disinfected after each student has used the equipment.
 - Cannot Disinfect Equipment/Samples: Some samples/specimens/equipment will be harmed if disinfectant is used on them. Students should refer to faculty on how/when to disinfect these types of items.
 - Microscopes: Microscopes should be disinfected before and after use. In each teaching lab, there is a designated spray bottle to use for microscopes. This solution is a combination of alcohol, vinegar and water.
 - Students should NOT touch the glass of the eyepieces.
 - Spray some of the microscope disinfectant on KimWipes.
 - Use the KimWipes to wipe off the microscope – everywhere that was touched and especially between the eyepieces where students breath onto.

- o DO NOT wipe the glass of the oculars with the disinfectant if at all possible. The alcohol could dissolve any adhesives, etc. in the eyepieces.
- o If instructors need to help students with their microscopes, make sure to disinfect the microscope before and after use.
- Run out of Disinfectant Spray? Bring the empty spray bottles to either Wendy or myself. We will exchange the spray bottles and get the empty ones refilled. This applies for both the general disinfectant spray and the microscope cleaner.

7. After-Hour Access to Teaching Labs for Students: Students will not be given after-hour access to any teaching labs. Students can only be in the lab outside of their regular lab time, if an instructor is present at all times. This is to help ensure that students keep required distances and disinfect their areas during these times. Capacities are limited to 50% normal + one instructor.

8. After-Hour Access to TA's. Are we going to have TA's for courses essentially work like they usually do – give them after-hour access or not?

Steps 2-5 are consistent with Dept. Chemistry and Physics. Signs that indicate these steps will be posted on lab doors.

Signs for Step 6 will be posted within each teaching lab room.

9. It is the faculty/instructor's responsibility to make sure the teaching lab they are using is stocked with paper towels, disinfectant spray, microscope disinfectant spray, soap, hand sanitizer, etc.

The following items can be found in 107 Holt:

- Paper towels
- Nitrile Gloves
- KimWipes
- Soap & Soap Refill
- Hand Sanitizer & Refill

The following items should be give to either Wendy or myself to refill:

- Disinfectant Spray Bottles
- Microscope Disinfectant Spray Bottles
- Disposable Face Masks

10. At the beginning of the Fall 2020 semester, each teaching lab has 10 disposable masks (in ziplock bag) that can be used in case a student forgot their mask, etc. This should be placed where anyone teaching in the lab can have access to it.

11. The statement below is one that I received from Chemistry/Physics (via legal) that you are welcome to include in syllabi or safety statements for your course. It is another statement that

emphasizes the fact that if anyone doesn't comply with these safety rules, they will be asked to leave the lab.

“Anyone deliberately violating safety rules may be asked to leave the lab and given a zero for that lab. Because of COVID-19 and the increased risk due to the close contact required between students and faculty, we reserve the right to check student's temperature. If the temperature is 100.4F or higher the student will be asked to leave the lab and a COVID-19 Illness/Travel Form will be submitted for that student.”

Appendix 1-A

Vision:

Building on the unique strengths of our faculty, staff, and students, we will be leaders of and advocates for innovative teaching, scientific discovery, and service.

Mission:

We are educators and scientists who embrace creativity, intellectual freedom, high academic standards, and diversity of thought and culture. Our mission is to 1) inspire students to become productive, responsible, and engaged members of the scientific community and society, 2) advance the fields of biology, geology, and environmental science by engaging in innovative research and scholarship, 3) be locally and globally engaged scientists who promote education in our community and worldwide, and 4) expand and enhance diversity and inclusivity in the sciences.

Values:

Faculty, staff, and students in Biology, Geology, and Environmental Science value:

- Broad scientific education that promotes an appreciation and deep understanding of the natural world
- Freedom of scientific thought
- The scientific process and effective dissemination of knowledge
- Integrity and collegiality
- Cultural diversity and inclusivity of people, thoughts, experiences and talent
- Community and global engagement

Goals:

1. **Prepare students with the knowledge, skills, and critical thinking abilities necessary to conduct research and to communicate technical information effectively in the areas of biology, geology, and environmental science.**
 - a. Develop a knowledge base and fundamental skill set for major and non- major students, as can be accomplished in:
 - i. Introductory courses
 - ii. Allied Health and other service courses
 - iii. Guided research experiences
 - iv. Departmental student organizations

- b. Provide experiences in critical synthesis of research, research design, and implementation thereof, as can be accomplished in:
 - i. Upper-level courses with relatively small enrollments
 - ii. Seminar courses
 - iii. Capstone research and/or experiential learning courses
 - iv. Individual or small-group faculty-directed research
 - v. Internships
- c. Provide instruction and experiences in writing and presentation, as can be accomplished in:
 - i. Scientific writing intensive courses
 - ii. Upper-level courses with relatively small enrollments
 - iii. Seminar courses
 - iv. Capstone research and/or experiential learning courses
 - v. Presentations at professional meetings
 - vi. Student-authored publications
- d. Advocate for the following needs of the department in order to provide instruction and experiences related to research, writing, and presentation:
 - i. Additional faculty
 - ii. Additional support staff
 - iii. Financial or course-release incentives for student mentorship
 - iv. Balanced teaching and research responsibilities
 - v. Support for professional development through grant writing and teaching pedagogy workshops, and similar opportunities

- 2. Provide a supportive environment and advocate for infrastructure to facilitate professional development of faculty and to promote student success

2.1 Maximize use and functionality of existing buildings (Holt and Grote Halls), develop other resources on and off campus (field labs, permanent research plots, greenhouses and nursery facilities, the Urban Farm, etc), and advocate for the necessary funding to accomplish these objectives.

- a. Develop Core facilities & support staff for:
 - i. Molecular/Microbiology preparation
 - ii. Microscopy and Imaging Facility
 - iii. Animal Care Facility
 - iv. Ecology/Aquatic Laboratories
 - v. Greenhouses/Nurseries/Growth chambers
 - vi. Field Sites and Laboratories
 - vii. Geoscience Laboratories
 - viii. Computer and Geospatial Laboratories

- b. Enhance the Museum and Herbarium through:
 - i. Support staff (or faculty research appointment – Curator)
 - ii. Broadening research collections e.g. Geology
 - iii. Acquisition of cabinets and freezers
 - iv. Investment in a backup power supply
 - v. Support of teaching collections
 - vi. Promotion of public access (display cases)
 - c. Modernize the teaching laboratories through:
 - i. Purchase of new laboratory equipment
 - ii. Infrastructure upgrades
 - iii. Thoughtful design of teaching laboratory, storage, and preparatory spaces
- 2.2 Advocate for a new building that has ample space to house all faculty, provides room for growth, and otherwise supports our departmental mission.**
- a. It will be a living laboratory with integrated elements of landscape and architectural design such as:
 - i. Real-time energy/resource use data on display
 - ii. Outdoor “laboratory” spaces
 - iii. Urban teaching-learning gardens
 - iv. Bioswales in its landscape design
 - v. Rooftop garden and greenhouses
 - b. It will be a sustainable building that is:
 - i. Bird safe
 - ii. Energy efficient
 - iii. Photovoltaic, wind powered, etc.
 - iv. Able to capture and reuse storm water and gray water
 - c. It will be designed to facilitate:
 - i. Innovative curriculum development
 - ii. Research (state-of-the-art laboratories and museum spaces)
 - iii. Community engagement targeting alumni, potential benefactors, stakeholders, etc.
 - iv. Integration of the Built Environment into local cultural and natural contexts
 - v. Learning Communities and continuing education opportunities
 - vi. Student libraries and study areas
 - vii. State-of-the-art classrooms and meeting spaces
 - viii. Advising Hubs
 - ix. Workshop spaces (carpentry and machine shop)

3. Support research and scientific discovery at departmental, faculty, and student levels
 - a. Department level
 - i. Improve communication between IACUC and IRB committees and faculty regarding the submission and evaluation of research protocols
 - ii. Compensate external speakers who give presentations to our department
 - iii. Maintain and support equipment and service contracts
 - iv. Establish a service/fabrication/machine shop
 - v. Purchase more departmental vehicles
 - vi. Offset publication costs
 - vii. Establish a close relationship with the Office of Development and Office of Research and Sponsored Programs to increase funding opportunities.
 - viii. Highlight departmental accomplishment at the university, local, and regional scales
 - b. Faculty level
 - i. Provide compensation for mentoring undergraduate and graduate students (e. g. course release, contact hour reduction, increased pay to attract quality research assistants)
 - ii. Provide sufficient research support for all faculty
 - iii. Provide startup funds and ongoing financial support for research activities that are competitive with peer institutions
 - iv. Support opportunities for scholarly and creative activities for non-tenure track faculty, and recognize and reward such achievements
 - c. Student level
 - i. Increase number of graduate teaching and research assistantships and make stipends more competitive with peer institutions
 - ii. Establish separate funds for undergraduate and graduate student travel
 - iii. Advocate for increased funding to support undergraduate research

4. Promote life-long student success through traditional and experiential learning opportunities
 - a. Cultivate a positive perception of science in UTC students
 - b. Prepare students for science-based careers and post-baccalaureate studies by increasing student involvement in capstone experiences, internships, research, and service
 - c. Increase post-baccalaureate achievement through comprehensive advising

strategies

- i. Advertise career development and post-baccalaureate opportunities in a central information center and online
 - ii. Develop and sponsor graduate program presentations and resume and curriculum vitae workshops
 - d. Participate in and/or sponsor academic and professional development activities that promote engagement in the natural sciences.
 - i. Develop and sponsor a workshop series on scientific communication (e.g. proposal writing, poster and oral presentation design)
 - ii. Encourage and fund participation at professional meetings
 - iii. Utilize Biology Seminar as an avenue to teach undergraduate students how to give a formal presentation
 - iv. Support student involvement in scientific honor societies and clubs
 - e. Celebrate the unique strengths and achievements of the biology, geology and environmental sciences community
 - i. Develop alumni and student achievement webpages with links for individual donations and submissions
 - ii. Publish a regular departmental newsletter
 - iii. Maintain a centrally located presentation cabinet that highlights student and faculty research and achievements
5. Promote, embrace, and celebrate cultural and intellectual diversity and inclusion in scientific disciplines
- a. Increase and maintain diversity and inclusivity within our department
 - i. Recruit and retain students, faculty, and staff from underrepresented groups
 - ii. Create an inclusive atmosphere within the department that is supportive of faculty, students, and staff with diverse needs and backgrounds
 - iii. Highlight scientific contributions of individuals from diverse backgrounds in the classroom and through informal educational activities
 - b. Expand and enhance cultural and intellectual diversity
 - i. Promote study-abroad and cultural exchange opportunities among students and faculty
 - ii. Increase funding to support outside speakers from diverse backgrounds
 - iii. Host a regular departmental symposium to highlight departmental research and cultural and scientific collaboration

- c. Implement training and policies to prevent bias and discrimination
 - i. Establish and require formal sensitivity, diversity, and implicit bias training for faculty
 - ii. Develop a zero-tolerance policy regarding discrimination on the basis of race, gender, sexual orientation, age, physical or mental handicap, religion, and national origin

- 6. Advance integrated service as part of personal and social responsibility
 - a. Coordinate with university programs (e.g. ThinkAchieve) to develop and enrich service learning experiences for students and faculty
 - b. Charge departmental student organizations to make socially responsible decisions that have real, beneficial and measurable impacts on the local, regional and global communities
 - c. Make a significant contribution to our community and society through research, education and scientific outreach targeting K-12 education, community groups, civic groups and environmental agencies
 - d. Use the departmental website as a portal to inform and increase social awareness by advertising activities of local organizations, linking to departmental activities that make a difference in our community and highlighting current social, environmental and geological issues of concern
 - e. Mindfully integrate a conservation ethic in our research and education, focused on maintaining the health and diversity of the natural world

Appendix 1-B

Revised curriculum map (2023) for Biology

The SLO numbers correspond to the new SLOs present in section Table 1.1 in Section 1.2.2. Biology Learning Outcomes. I – Program SLO is introduced and assessed, R – Program SLO is reinforced and assessed, C – Level of competency is assessed.

Biology Key I = Introduce R = Reinforce C = Competency	SLO1 Core Knowledge. Students demonstrate understanding of core concepts in the discipline as they apply to various levels of biological organization (i.e., from molecules to ecosystems) and taxonomic groups (e.g., viruses, prokaryotes, plants, fungi, insects, fishes, reptiles, birds, mammals, etc.), including structure and function, genetics, evolution, and ecology.	SLO2 Resources and Tools. Students use scientific resources to collect biological information, including the literature base, established methodologies and technologies, laboratory and field equipment, and/or computational tools.	SLO3 Scientific Process. Students ask and address biological questions by developing hypotheses, designing and conducting relevant empirical and/or theoretical tests, and critically analyzing and interpreting results.	SLO4 Communication and Engagement. Students disseminate biological information in various formats (i.e., oral, written) and engage with various audiences (i.e., scientific, general) as is essential to career development in the discipline.
BIOL 1110	I	I	I	I
BIOL 1120	I	I	I	I
BIOL 1130	I	I		I
BIOL 2060 Anatomy	I	I		
BIOL 2080 Physiology	I	I	I	I
BIOL 2100 Microbiology	I	I	I	I
BIOL 3060 Ecology	R	R		R

BIOL 3070 Ecology L		R	R	R
BIOL 3250 Genetics	R	R/C	R/C	R/C
BIOL 3260 Genetics L	R	R/C	R/C	R/C
BIOL 3350 Evolution	R	R		
BIOL 3400 Env Surv Meth	R	C	C	C
BIOL 4020 Meiofa Biod	C	C	C	C
BIOL 4050 Com Ver Z	C	C		C
BIOL 4070 Entomology	C	C		C
BIOL 4085 Parasitology	C	C		C
BIOL 4090 Herpetology	C	C	C	C
BIOL 4100 Poll Biol	R/C	R/C	C	C
BIOL 4110 Ichthyology	C	C		
BIOL 4130 Invert Z	C	C		C
BIOL 4140 Mammalogy	C	C		C
BIOL 4150 Mycology	C	C	R	C
BIOL 4170 Ornithology	C	R/C	R	R
BIOL 4180 Plant M	C	C	R	R
BIOL 4190 Plant Tax	C	C	R	R
BIOL 4195 Field Botany	R	C	C	C
BIOL 4200 Mol Genetics	R	C	C	C
BIOL 4210 Animal Phys	R	C	C	C
BIOL 4220 Microbiology	R	R	C	C

BIOL 4240 Mol Eco Evol	C	C		
BIOL 4280 Cellular B	C	C	C	
BIOL 4310 Behav Ecol	R		C	C
BIOL 4325 Wild Admin Pol	C			C
BIOL 4335 Wild Edu Rehab	R	R	R	C
BIOL 4340 Human D D	C	C		
BIOL 4360 Plant Phys	C	C	C	
BIOL 4380 Toxicology		C	C	
BIOL 4390 Marine Eco	R	R/C	R	
BIOL 4400 Trop Mar E	C	C	C	
BIOL 4410 Animal B	C	C	C	C
BIOL 4420 Biogeography	C	C	R	R
BIOL 4430 Bioremed	C	C	C	C
BIOL 4440 Dev Vert Em	C	C		
BIOL 4460 Global Ch B	C	C		C
BIOL 4470 Ecol Evol Sta	C	C	C	C
BIOL 4480 Ant Ecology	C	C	C	C
BIOL 4500 Systematics	C	C		C
BIOL 4512 Amp Eco Cons	C	C		C
BIOL 4514 Rep Eco Con	C	C		C
BIOL 4520 Limnology	R/C	R/C	R/C	R/C
BIOL 4530 Microbial E	R	C	C	C

BIOL 4540 Plant Ecology	C	C	C	C
BIOL 4550 Hist Evo Thought	C	C		
BIOL 4580 Ecology of Rarity	C	C		C
BIOL 4590 Ad T Evol E	C	C		
BIOL 4610 Biology Sem			C	C
BIOL 4620 Economic Bot	R	R		R/C
BIOL 4630 Endocrin	R	R	R	R
BIOL 4680 Introd Soil		C	R/C	C
BIOL 4710 Histology	R	R	R	
BIOL 4720 Immunology	R	R	C	C
BIOL 4740 Virology	R	C	C	C
BIOL 4750 Dendrology	C	R	R	
BIOL 4760 Hum Inf Dis	I, R, C	R,C	R,C	C
BIOL 4770 Cancer Biol	R/C	C	C	C

Appendix 1-C

SLO Cycle 2023-2028

Year		23-24	24-25	25-26	26-27	27-28	28-29	29-30
SLO 1	Outcome 1: Characterize and identify common geologic materials (e.g. minerals, rocks, fossils, and soils) in field and/or laboratory settings.	Mineralogy		XXX		XXX		XXX
SLO 2	Outcome 2: Describe slow, commonly imperceptible, geologic processes in the context of the enormous scale of geologic time, and the energy gradients that drive them.		XXX		XXX		XXX	
SLO 3	Outcome 3: Apply knowledge of geology and systems thinking to critically assess problems that impact society.	Sed Strat		XXX		XXX		XXX
SLO 4	Outcome 4: Use spatially, geometrically, and/or temporally related data to formulate conceptual and/or computational models to effectively interpret geologic structures, geologic processes, geologic history and/or the genesis and evolution of geologic materials and structures.		XXX		XXX		XXX	
SLO 5	Outcome 5: Demonstrate critical thinking through the effective design and execution of geologic research.	4900	XXX	XXX	XXX	XXX	XXX	XXX
SLO 6	Outcome 6: Effectively communicate geotechnical information by written, oral, and graphical means.	4900	XXX	XXX	XXX	XXX	XXX	XXX

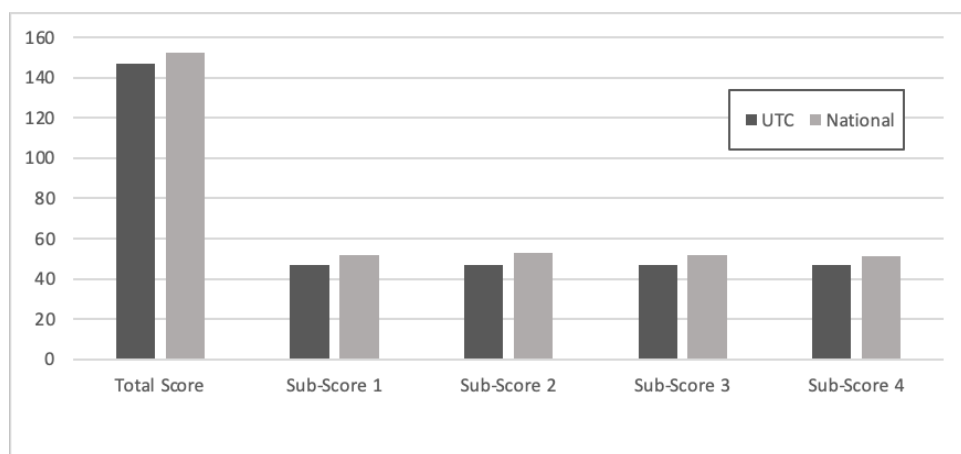
Appendix 1-D

Schedule of Major Field Testing at UTC for academic years 2017-18 to 2024-25.

2017-2025 Major Field Testing Schedule							
2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
English	Computer Science	Communications	Biology		English	Art	Chemistry
Political Science	Criminal Justice	Economics	History		Math	Communication	Modern and Classical Languages & Literatures
Psychology		Engineering Technology Management	Geology		Psychology	Computer Science	Engineering Technology Management
					Political Science	Criminal Justice	Social Work
					Accounting	Environmental Science	Chemical Engineering
					Business Analytics	Mechatronics	Civil Engineering
					Entrepreneurship	Sociology & Anthropology	Computer Engineering
					Finance		Electrical Engineering
					Management		Mechanical Engineering
					HR Management		
					Marketing		
					Economics		

Appendix 1-E

ETS Major Field Test scores for UTC vs. National average in the categories of scaled total score, Sub-Score 1 (cell biology), Sub-Score 2 (molecular biology & genetics), Sub-Score 3 (organismal biology), and Sub-Score 4 (population biology, evolution & ecology) for the 2020-2021 academic year.



Appendix 1-F

Principles of Biology I

Laboratory Fall 2023

BIOL 1110L, CRN 40181, Face-to-Face, 0 Credit Hours

Instructor: Dr. Jodi Caskey (she/her)

Email and Phone Number: jodi-caskey@utc.edu; 423-425-5769

Office Hours and Location: 232H Holt Hall; Monday (9-11 am), Tuesday (1-3 pm), Wednesday (2-3 pm), Friday (9-10 am) or by appointment; I can meet with you via Zoom or in my office. No appointment needed for in person office hours.

Course Meeting Day, Times, and Location: Tuesday 8:50-10:40 am; Holt 216

Course Fees: \$50.00

Course Catalog Description: Principles of Biology I (4 credit hours) is an introduction to systematic ways in which the human mind comprehends the natural world; emphasis on studies of living systems, natural processes, and related phenomena including methods of the biologist, Darwin's evolutionary theory, role of organic molecules in biological systems, cell organization, cellular division, Mendelian inheritance, molecular genetics, speciation, and global environmental issues.

Course Pre/Co Requisites: This course is the laboratory component for BIOL 1110, Principles of Biology I. Lecture and laboratory are course co-requisites. All students, including students who are repeating the course, must enroll in and attend both lecture and laboratory.

Credit: 0 hours. The lab grade is 25% of the course grade for BIOL 1110, a 4 credit-hour course.

Course Student Learning Outcomes: By the end of this course, you will be able to:

1. Demonstrate knowledge of and differentiate among the different levels of biological organization.
2. Demonstrate knowledge of the three core areas of biology and apply that knowledge to studies of various taxonomic groups.
3. Demonstrate proper laboratory techniques, formulate appropriate questions and hypotheses, collect laboratory data, and analyze collected data in a variety of biological

contexts.

4. Communicate biological information effectively.

General Education Statement: Principles of Biology I (lecture and laboratory) is a 4-hour course and is certified as a General Education course fulfilling the Natural Sciences category. Please consult with your advisor and check the specific requirements for your major to determine if this course is a good fit for your plan of study. Upon completion of the required credit hours in this category, you will be able to:

1. Students will demonstrate the connection between scientific theory and application.
2. Students will apply the methods of science by testing hypotheses and reporting the results.

Required Course Materials: *Laboratory Manual:* Adams C, Bell R, Collins L, Klug H, Murphy C, Shaw J. 2023. Investigations in Biology. Laboratory Manual. Biology 1110, 6th Ed., Hayden McNeil. ISBN 978-1-5339-5991-1. The manual is purchased through the UTC bookstore, and will be **new for this semester**.

Technology Requirements for Course: You need access to a computer with a reliable internet connection. Test your computer set up and browser for compatibility with UTC Learn (Canvas).

Technology Skills Required for Course: You will use Microsoft Word and Excel, the learning management system (UTC Learn; Canvas), and your UTC email.

Digital Literacy Skills Required for Course: You will learn how to search online library databases to locate and gather appropriate information for lab reports. In addition, you will learn how to properly cite these sources.

Technology Support: If you have problems with your UTC email account or with UTC Learn (Canvas), contact IT Help Desk at 423-425-4000 or email helpdesk@utc.edu.

Student Technology: If you have technology needs to access your courses and/or complete course requirements in Canvas, [submit a request](#) with Information Technology.

Communication: Course announcements are made through UTC Learn and email. UTC email is the official means of communication between you and I at UTC. Emails sent to me must be clear and professional. You are expected to check your UTC Learn and UTC email account daily. I typically respond to clear and professional emails received Monday through Friday during normal business hours on the same day they are received. Emails received after business hours and on weekends will be responded to during the next business hours.

Course Assessments and Requirements: Your laboratory grade is based on a combination of weekly quizzes, a lab completion grade, the Avoiding Plagiarism tutorial, lab reports (first and final drafts), a mid-term lab practical exam and a final lab practical exam.

- **Quizzes:** There are nine quizzes, worth 5 points each. The lowest quiz grade will be dropped. Therefore, *there will not be any make-up quizzes*. If you miss a quiz, this will

serve as the lowest quiz grade and will be dropped, even if your absence is excused. Each quiz will consist of four questions on the previous week's exercise and one general question on the current day's exercise. Quizzes are administered at the beginning of each lab period.

- **Lab Completion Grade:** At the end of each lab period, you are required to show your lab manual to me. I will check that you have completed the entire lab exercise (this includes all the day's activities and questions, and the definitions and questions at the end of the exercise). If all have been answered/drawn, etc., you will receive one point. Note: points are based upon completion, not content. There is one point for each lab exercise for a total of 11 points possible. No partial credit will be awarded.
- **Avoiding Plagiarism Tutorial:** In preparation for writing your lab report, you will take the UTC Avoiding Plagiarism Tutorial for a grade. Instructions are within the 'Avoiding Plagiarism Tutorial' assignment on Canvas. You are welcome to take the tutorial as many times as you like up until the due date. Professor Jarvis will use your highest score earned for your grade. The UTC Library will send Professor Jarvis the grade(s) you received from the tutorial, and she will enter that grade into Canvas after the due date. She will convert the % grade from the tutorial into points for the assignment (5 points possible).
- **Lab Report:** The first draft of your lab report will be graded using a rubric, of which there is a copy at the back of your lab manual (Appendix 2). Once graded, I will return your first draft with comments on how to improve your lab report. Based upon my comments, you will re-write your lab report and give it back to me by the following lab meeting (final draft). You must take comments into account and not turn in the exact same lab report to earn points for the final draft. I will grade your final draft based upon the same rubric as before. Each draft of your lab report is worth 20 points (40 points total).
- **Mid-Term and Final Lab Practical Exams:** The Mid-Term and Final Lab Practical Exams are worth 50 points each. Details about the lab practical procedure will be announced later in the semester. The Mid-Term exam covers exercises 1-5, while the Final Exam covers Exercises 6-11. If an emergency prevents you from taking the mid-term or final exam, you are required to notify me within 48 hours of the missed exam and provide documentation of an acceptable reason for the absence (e.g., notification letter from the Office of Student Outreach and Support). There will be no make-up exams.

THERE WILL BE NO EXTRA CREDIT AWARDED

To satisfy the course writing component required by the university general education committee, all quizzes and exams require answers in grammatically correct complete sentences to express understanding of the concepts demonstrated in the laboratory exercises.

Course Grading

Course Grading Policy: BIOL 1110L laboratory grade will be determined as follows:

Weekly Quizzes	40 points total (5 points each)
Lab Completion	11 points total (1 point each lab exercise)
Avoiding Plagiarism Tutorial	5 points
Lab Report First Draft	20 points
Lab Report Final Draft	20 points
Mid-Term Lab Practical	50 points
Final Lab Practical	50 points
Total Points Possible	196 points

I will post grades on UTC Learn throughout the semester.

Final lab grades are given to BIOL 1110 lecture instructors as a percentage of the total points possible. Final lab grades are not rounded. Final grades for BIOL 1110 (lecture and lab) will use the grading scale in your BIOL 1110 Lecture syllabus. The laboratory grade is 25% of the final course grade.

Instructor Grading and Feedback Response Time: I will try my best to grade all assignments within one week of the due date. However, be aware that this is not my only course nor my only responsibility at UTC. I will always let you know when grades will take longer than 1 week. Grades will be posted on UTC Learn (Canvas) once assignments are graded.

Course and Institutional Policies

Laboratory Safety: You are required to know the laboratory safety guidelines outlined in Appendix 1 of your lab manual. These guidelines are also posted on UTC Learn. You will be tested over these guidelines.

FOOD AND BEVERAGES ARE NOT ALLOWED IN THE LABORATORIES

Late/Missing Work Policy: As stated above, the lowest quiz grade will be dropped. Therefore, there will not be any make-up quizzes. If you miss a quiz, this will serve as the lowest quiz grade and will be dropped, even if the absence is excused.

If an emergency prevents you from taking the mid-term or final lab practical exam, you are required to notify me within 48 hours of the missed exam and provide documentation of an acceptable reason for the absence (e.g., notification letter from Office of Student Outreach and Support). There will be no make-up exams.

Student Conduct Policy: UTC's Student Code of Conduct and Honor Code (Academic Integrity Policy) can be found on the [Student Conduct Policy Page](#).

Honor Code Pledge: As a student at the University of Tennessee at Chattanooga, I pledge that I will not give or receive any unauthorized assistance with academic work or engage in any academic dishonesty to gain an academic advantage. I will exert every effort to ensure that the Honor Code is upheld by myself and others, affirming my commitment to a campus-wide climate of honor and integrity.

Generative Artificial Intelligence (AI): Use Prohibited: All submitted coursework must be your own original work. Inclusion of proper citations, using the accepted citation style for this course, is required per the UTC Honor Code. The use and/or inclusion of any materials derived by a Generative AI tool is strictly prohibited. Failure to follow any of the guidelines constitutes a violation of the Honor Code and will result in a referral to the Office of Student Conduct.

Turnitin Statement: I reserve the right to submit papers to the UTC Learn text-matching software (Turnitin/UniCheck) for review and analysis of originality and intellectual integrity. If the results of the review indicate academic dishonesty, disciplinary action may be taken as outlined in the UTC Student Handbook.

Course Attendance Policy: You are **required to attend all laboratory sessions**, take part in class discussions, and demonstrate satisfactory performance on assessments. It is essential that you arrive at the lab prepared. This means come to lab having read the assigned lab exercise and completed the definitions and questions at the end of the lab exercise (you are being quizzed over this material too). It is also critical to arrive on time to complete daily quizzes and hear pre-lab instructions. Failure to arrive on time could result in a missed quiz. *There are no make-up labs.*

If you are absent from a lab, verified documentation must be provided to me to provide reasonable accommodation. To help with this process, you are encouraged to submit your original documentation to the Office of Student Outreach and Support within 48 hours of your absence. They will provide me with documentation of your absence. Reasonable accommodations may include, but is not limited to, submission of late coursework within a reasonable amount of time, dropping lowest quiz grade, or alternate assignments. Work associated with any absence accommodation must be completed by you according to the plan devised by me in coordination with you.

There are no make-up labs. Online resources are not available to complete the labs online. For absences, it is strongly encouraged that you attend my office hours to go over material/concepts. In addition, it is strongly encouraged you attend the Open Labs that are available before each lab practical exam.

Disruptive behavior will not be tolerated. This includes, but is not limited to, private discussions that disrupt others, cell phone calls and text messaging, late arrivals, and early departures. Cell phones are to be kept in your backpack or something similar. Disruptive students will be asked to leave and may face disciplinary action.

Absences Due to Conferences and UTC-related Events: If you will miss class to attend and represent UTC at conferences or other UTC-related events, *you need to do the following:*

- Notify me about your absence 1 week before the scheduled event either in writing or electronically.
- Within the notification, include:
 - The name of the event/conference you will be attending
 - The dates of the event
 - Name of your faculty advisor/sponsor

When the above requirements have been met, I will work with you concerning any missed assignments.

Course Participation/Contribution: Please refer to the Course Attendance Policy.

Student Accommodations: If you have accessibility and accommodation requests, contact the [Disability Resource Center](#) at 423-425-4006 or email DRC@utc.edu.

Student Support Resources and Privacy and Accessibility Statements: A list of student resources and privacy and accessibility statements are available on the [WCTL Student Resources Page](#).

Course Learning Evaluation: Course evaluations are an important part of our efforts to continuously improve the learning experience at UTC. Toward the end of the semester, you will be emailed links to course evaluations and are expected to complete them. We value your feedback and appreciate you taking time to complete the anonymous evaluations.

UTC Bookstore: The UTC Bookstore will price match Amazon and [Barnes and Noble](#) prices of the exact textbook (same edition, ISBN, and format, with the same rental term). For more information, go to the [Bookstore Price Match Program](#), visit the bookstore in the University Center, email sm430@bncollege.com, or call 423-425-2184.

Course Calendar/Schedule: Schedule is subject to change.

WEEK OF:	TOPIC
21-24 August 2023	Introduction Exercise 1: Information Literacy
28-21 August 2023	Quiz 01 Exercise 2: Scientific Method.
1 September 2023	Avoiding Plagiarism Tutorial Due by 11:59 PM EST See Canvas Assignment for Details
4-7 September 2023	NO LABS THIS WEEK - Labor Day Holiday
11-14 September 2023	First Draft of Lab Report Due at the <u>beginning</u> of lab period Quiz 02 Exercise 3: Focus on the Cell.
18-21 September 2023	Quiz 03 Exercise 4: Movement of Molecules.
25-28 September 2023	Final Draft of Lab Report Due at the beginning of lab period Quiz 04 Exercise 5: Mitosis and Cytokinesis.
29 September 2023	OPEN STUDY LAB 8am - 5pm
2-5 October 2023	Mid-Term Lab Practical Exam
9-12 October 2023	No Quiz Exercise 6: Meiosis.
16-19 October 2023	NO LABS THIS WEEK - Fall Break
23-26 October 2023	Quiz 05 Exercise 7: Heredity.
30 Oct-2 November 2023	Quiz 06 Exercise 8: Molecular Basis of Heredity.
6-9 November 2023	Quiz 07 Exercise 9: Microevolution.

WEEK OF:	TOPIC
	Exercise 11: Animal Behavior.
13-16 November 2023	Quiz 08 & Quiz 09 Exercise 10: Fossils and Geologic Time.
17 November 2023	OPEN STUDY LAB 8am-5pm
20-23 November 2023	NO LABS THIS WEEK - Thanksgiving Break
27-30 November 2023	Final Lab Practical Exam

Biology 1110 Laboratory Coordinator. If you cannot reach your laboratory instructor, or have unresolved problems or concerns, contact Professor Caitlin Jarvis; 212 Holt; 423-425-2105; caitlin-jarvis@utc.edu.

Principles of Biology II Fall 2023

BIOL, 1120, 40194, Face-To-Face, 4 Credit Hours

Instructor: Dr. DeAnna E. Beasley

Email and Phone Number: deanna-beasley@utc, 423-425-5967, I will respond to emails within 24 hours on weekdays and within 48 hours on weekends.

Office Hours and Location: MW 8:00 – 9:30 AM or by appointment, Holt Hall 308-A

Course Meeting Days, Times, and Location: MWF 12:00 – 12:50 PM, ENGR/Math/CPSC 201

Course Catalog Description: An introduction to systematic ways in which the human mind comprehends the natural world; emphasis on studies of living systems, natural processes, and related phenomena including evolutionary change in populations, origin and evolutionary history of life, systematics, survey of kingdoms, and ecology. Lecture 3 hours, laboratory 2 hours

Course Pre/Co Requisites: Prerequisites: BIOL 1110 with a minimum grade of C or department head approval. Corequisites: BIOL 1120L or department head approval.

Course Student Learning Outcomes: Upon successful completion of this course (lecture and laboratory), students will be able to: 1) demonstrate knowledge of different levels of biological organization and apply their knowledge to differentiate among various taxonomic groups. 2) demonstrate knowledge of evolution (e.g., micro- and macro-evolution, evolutionary history of life, systematics) and apply their knowledge to various taxonomic groups. 3) demonstrate knowledge of ecology at different levels of biological organization. 4) communicate biological information effectively in a written lab report and retrieve specific information from the scientific literature for that lab report.

General Education Student Learning Outcomes: This course is a General Education Natural Sciences course with a laboratory. Upon completion of the required credit hours in this category, students will be able to: explain how scientific knowledge develops over time as new evidence emerges; demonstrate scientific literacy by locating, evaluating, interpreting, and applying scientific information/data; explain how scientific developments impact society; demonstrate the connection between scientific theory and application; and apply the methods of science by testing hypotheses and reporting the results.

Required Course Materials: *Biology in Focus* by Urry, Lisa with Modified Mastering Biology, available in our Canvas course space via the 'Course Materials - First Day' link. If you took BIOL 1110 at UTC last semester, your access to *Biology in Focus* is still active this semester. If

you did not take BIOL 1110 at UTC last semester, please speak to your instructor about how to gain access to *Biology in Focus*. Scantrons (Form 882-E, small, green)

Technology Requirements for Course: Access to a computer with a reliable broadband Internet connection, ability to listen to videos and other audio content using a speaker or headphone, access to Firefox, access to Pearson Mastering Biology, and access to an updated version of Microsoft Office (available to all UTC students via the O365 login, found within the Tools section of the UTC homepage).

Technology/Digital Literacy Skills Required for Course: These include locating, evaluating, and communicating information in different formats (e.g., visual, audio or textual modes) by using various digital platforms (e.g., Web browser, Mastering Biology platform, Canvas, MyMOCSNet email, Microsoft Office, etc.).

Course Assessments and Requirements: This course consists of a lecture and a laboratory, which are corequisites. Students must be enrolled in both lecture and lab. The course assessments and requirements are outlined below.

- o Lecture: The lecture grade is 75% of the final course grade. Lecture assessments include:

10 Online Quizzes	50 pts	16%
5 Online Homework Assignments	50 pts	16%
3 One-Hour Exams	120 pts	37%
1 Cumulative Final Exam	100 pts	31%

- o Laboratory: The lab grade is 25% of the final course grade. Consult your lab syllabus for a list of assessments. Consult your lab instructor for your lab grade.

Course Grading

Course Grading Policy: Course Grading Policy: 90-100% = A; 80-89% = B; 70-79% = C; 60-69% = D; <60% = F. Final grades will be rounded precisely. If you have an 89.4% final average, this is a B. If you have a 69.5%, this is a C. **Please note: All grades are final and non-negotiable.**

Instructor Grading and Feedback Response Time: Exams, homework assignments, and quizzes will be returned within 1 – 2 weeks.

Course Policies

Late/Missing Work Policy: There will be no make-up exams, quizzes or homework assignments for any reason. If you miss an exam, you must notify me via email within 24 hours and provide an [academic notification](#) within 48 hours. Once I receive the academic notification, the final examination grade will be substituted for the missed hour exam grade. In other words, the final exam will count twice, both as a final exam grade AND as the grade for the exam you missed. **This is available only once.** If you miss a quiz or homework assignment and provide an academic notification, the missing grade will be calculated by averaging the other grades. **This is available only once.** Examples of requests include bereavement/death of a family member or friend, physical health concern, mental health concern, military obligations, legal obligations, pregnancy and/or parenting, sexual misconduct, relationship violence, or stalking. Note that the following are NOT acceptable excuses for missing an exam, quiz or homework assignment: work schedule conflict, job interviews, overslept, arrested, family celebrations, car trouble, vacation travel.

Course Attendance Policy: I strongly encourage students to attend all classes, ask questions, and participate in discussions. I do not take formal attendance because: 1) I believe it is the student's responsibility to hold themselves accountable for their learning, and 2) I want to provide a flexible attendance policy so students can address their life needs. That said, students are responsible for any missed course material and in-class assessments and are expected to keep up with their learning in the event of an absence. Keep in mind that any extra credit opportunities will only be available in class and no make ups will be allowed under any circumstances.

Course Participation/Contribution: Participation will be evaluated based on in class activities, assessments, and consistent adherence to University policies and procedures.

Course Calendar/Schedule: The tentative weekly schedule for the course is listed below. This schedule is subject to change. You will be alerted to any significant changes via Canvas Announcements.

Week	Lecture Topics
1 (Aug 21 - 25)	Introduction 21.2 The Evolution of Populations (The Hardy-Weinberg equation can be used to test whether a population is evolving)
2 (Aug 28 – Sept 1)	22 The Origin of Species

Week	Lecture Topics
Sept 1: Homework assignment #1 due online Aug 30: Quiz #1 due online	23 Broad Patterns of Evolution
3 (Sept 4 - 8) Sept 3: Last day to drop class before W Sept 4: Labor Day Holiday (No class) Sept 6: Quiz #2 due online	20 Phylogeny 17 Viruses
4 (Sept 11 - 15) Monday, Sept 11: EXAM 1	24 Early Life and the Diversification of Prokaryotes 25 The Origin and Diversification of Eukaryotes
5 (Sept 18 - 22) Sept 20: Quiz #3 due online Sept 22: Homework assignment #2 due online	26 The Colonization of Land 30 Reproduction and Domestication of Flowering Plants
6 (Sept 25 - 29) Sept 27: Quiz #4 due online	30 Reproduction and Domestication of Flowering Plants
7 (Oct 2 - 6)* Oct 4: Quiz #5 due online Oct 6: Homework assignment #3 due online	26.2, 26.5 The Colonization of Land (Fungi)
8 (Oct 9 - 13)* Monday, Oct 9: EXAM 2	27.1, 27.2 The Rise of Animal Diversity
9 (Oct 16 - 20) Oct 16 -17: Fall Break (No class) Oct 18: Quiz #6 due online Oct 20: Homework assignment #4 due online	27.3 The Rise of Animal Diversity

Week	Lecture Topics
10 (Oct 23 - 27) Oct 25: Quiz #7 due online	27.4, 27.5, 27.6 The Rise of Animal Diversity
11 (Oct 30 – Nov 3) Oct 30: Last day for official withdrawal with a W Nov 1: Quiz #8 due online	27.6, 27.7 The Rise of Animal Diversity
12 (Nov 6 - 10) Monday, Nov 6: EXAM 3	40 Population Ecology and the Distribution of Organisms
13 (Nov 13 - 17) Nov 15: Quiz #9 due online Nov 17: Homework assignment #5 due online	41 Ecological Communities
14 (Nov 20 - 24) Nov 22: Quiz #10 due online Nov 23 – 26: Thanksgiving Holiday (No class)	42 Ecosystems and Energy
15 (Nov 27 – Dec 1) Dec 4: Last day of class	41.4, 41.5 (Biogeography, Pathogens alter comm strx locally & globally) Final exam: Wednesday, December 6 10:30 AM – 12:30 PM

*Notification of midterm grades

Functional Human Anatomy Laboratory

FALL 2023

Department of Biology, Geology and Environmental Science (phone: 423-425-4341)

University of Tennessee at Chattanooga

BIO2060L, CRN 40750, Modality: F2F, 4 credit hours with 0 credit laboratory

Instructor: Prof. Jeremy L. Bramblett

Email and Phone Number: Jeremy-Bramblett@utc.edu; (423) 425-5788

Office Hours and Location: M 1:00-2:00PM, R 9:00-10:00AM, 1:00-3:00PM, Other times by Appointment including virtually via Zoom; Grote 101

Course Meeting Days, Times, and Location: W 12:00-1:50PM; Grote 109

Course Catalog Description: The structure of the human body as seen in its various levels of organization: cellular, tissue, organ, and system. Lecture 3 hours, laboratory 2 hours. Corequisite: BIO2060L or department head approval. Laboratory/studio course fee will be assessed.

Course Prerequisites: none

Course Corequisites: BIO2060

Course Student Learning Outcomes:

1. Students will be able to demonstrate knowledge of and explain the structure of the human body at cellular, tissue, organ, and organ system levels.
2. Students will be able to demonstrate knowledge of and explain some of the functions of cells, tissues, organs, and organ systems of the human body.
3. Students will be able to identify specific features of skeletal, muscular, cardiovascular, nervous, digestive, respiratory, urinary, and reproductive systems of the human body and other traditional laboratory animals.

Course Fees: \$50

Required Course Materials: Textbook: Marieb, Brady, and Mallatt. 2019. *Human Anatomy* (9th Edition, e- textbook), Pearson, ISBN 9780135242339 with Modified Mastering A&P (Pearson “First Day” Program).-*Required Mink Manual:* Dissection Guide and Atlas to the Mink, D.G Smith & M.P. Schenk, 2000 (covers mink and sheep organs) – *Required Human Body Atlas:* A Brief Atlas of the Human Body, M. Hutchinson, J. Mallat, E.N. Marieb, & P.B. Wilhelm, 2010 (comes packaged with your textbook) – *Recommended Outline:* Functional Human Anatomy Laboratory Outlines – *Required*

Supplemental/Optional Course Materials: Visual Analogy Guide: Visual Analogy Guide to Human Anatomy, P.A. Krieger–
Recommended

Technology Requirements for Course: You need access to a computer with a reliable internet connection. Test your computer set up and browser for compatibility with Canvas at <http://www.utc.edu/learn/getting-help/system-requirement.php>. You will also need access to a smartphone or digital camera and a printer.

Technology Skills Required for Course: Students will be expected to have a personal computer with reliable Internet access along with associated hardware and software for accessing Canvas. Students may test their computers set up and browser for compatibility with Canvas at <http://www.utc.edu/learn/getting-help/system-requirements.php>. Students should also have an updated version of Adobe Acrobat Reader, available free from <https://get.adobe.com/reader/>. Online quizzes and exams could include pictures, which sometimes do not appear when using Safari. Firefox typically is more reliable for viewing pictures, etc. on Canvas. Students need to be able to make a pdf showing completed exercises within your lab manual. This can be done by taking pictures and converting to pdfs or using apps to make pdfs from your phone (Scanner App; Scan+ are examples) or something similar. You need to upload these files and others (e.g.pdf, word documents) to Canvas. See <https://guides.instructure.com/m/4212> for specific instructions. Students need to be able to participate in Zoom meetings. In Canvas (Account/Settings), make sure that the time zone setting corresponds to your online location. This will help ensure that assignments/quizzes/exams will be submitted on time.

Digital Literacy Skills Required for Course: Students need to be proficient with Microsoft Word and Excel, using the learning management system (Canvas), using MOCSNet email, and creating and submitting files to Canvas in a .pdf format.

Technology Support: If you have problems with your UTC email account or with UTC Learn (Canvas), contact IT Help Desk at 423-425-4000 or email helpdesk@utc.edu.

Student Technology: If you have technology needs to access your courses and/or complete course requirements in Canvas, [submit a request](#) with Information Technology.

Communication: Course announcements will be made through Canvas and email. UTC email is the official means of communication between instructor and student at UTC. Emails must be clear and professional. Students should check their UTC email and Canvas on a regular basis.

Campus Safety Policy: Due to COVID-19, there is a campus safety policy <https://www.utc.edu/academic-affairs/university-policies-and-procedures/administration-and-operations/interim-covid-19-related-policies> for classes that meet on campus; please review this policy.

Course Assessments and Requirements:

Three laboratory practical exams - 300 points (100 points each)

Quizzes - 100 points

Total laboratory points = 400 points

Course Grading Policy: The laboratory grade will contribute to the BIO2060 lecture grade.

Instructor Grading and Feedback Response Time: Grades will be posted within 7 days of assignments' due dates. Emails will be answered within 24 hours, excluding weekends and holidays. If you do not receive a response to your email within 24 hours, please email me again.

Course and Institutional Policies

Late/Missing Work Policy: Late work is not accepted. Assignments may not be submitted late. Any missed/late assignment will count as a zero.

Student Conduct Policy: UTC's Student Code of Conduct and Honor Code (Academic Integrity Policy) can be found on the [Student Conduct Policy page](#).

Honor Code Pledge: As a student of the University of Tennessee at Chattanooga, I pledge that I will not give or receive any unauthorized assistance with academic work or engage in any academic dishonesty in order to gain an academic advantage. I will exert every effort to ensure that the Honor Code is upheld by myself and others, affirming my commitment to a campus-wide climate of honesty and integrity.

Course Attendance Policy: Students are expected to attend all class meetings and take all quizzes and exams during class meetings.

Course Participation/Contribution: Students are expected to attend and participate in all class meetings; take all quizzes and exams during class meetings; complete all assignments by the due dates posted on UTC Learn (Canvas).

Student Accommodations: If you have accessibility and accommodation requests, contact the [Disability Resource Center](#) at 423-425-4006 or email DRC@utc.edu.

Student Support Resources and Privacy and Accessibility Statements: A list of student resources and privacy and accessibility statements are available on the [WCTL Student Resources Page](#).

Course Learning Evaluation: Course evaluations are an important part of our efforts to continuously improve learning experiences at UTC. Toward the end of the semester, you will be emailed links to course evaluations, and you are expected to complete them. We value your feedback and appreciate you taking time to complete the anonymous evaluations.

UTC Bookstore: The UTC Bookstore will price match Amazon and [Barnes and Noble](#) prices of the exact textbook - same edition, ISBN, new to new format, used to used format, and used rental to used rental format, with the same rental term. For more information, go to the [Bookstore Price Match Program](#) visit the bookstore, email sm430@bncollege.com or call 423-425-2184.

Course Calendar/Schedule:

a = start of lab quiz (10pts); b = end of lab quiz/lab dissection checkout/homework (2pts); c = dissection checkout/homework (3pts)

DATE	TOPIC	LAB GUIDE
Aug 23, 24	Bones ^b	Text, Human Body Atlas
Aug 30, 31	Bones ^{a, b}	Text, Human Body Atlas
Sept 6, 7	Bones and Tissues ^a	Text, Human Body Atlas
Sept 13, 14	Tissues ^a	Text, Human Body Atlas
Sept 20, 21	PRACTICAL EXAM I	
Sept 27, 28	Muscles ^b	Text, Mink Manual
Oct 4, 5	Muscles ^{a, c}	Text, Mink Manual
Oct 11, 12	Heart, Blood ^{a, b}	Text, Mink Manual
Oct 18, 19	PRACTICAL EXAM II	
Oct 25, 26	Brain, Eye and Ear ^b	Text, Mink Manual
Nov 1, 2	Oral/Thoracic Cavity ^{a, c}	Text, Mink Manual

Nov 8, 9	Abdominal Cavity, Kidney ^{a,b}	Text, Mink Manual
Nov 15, 16	Reproductive System ^{a,b}	Text, Mink Manual
Nov 22, 23	THANKSGIVING HOLIDAY	
Nov 29, 30	PRACTICAL EXAM III	

Ecology Fall 2023

BIOL 3060, CRN 42560, online, 3.0 credit hours

Instructor:	Jennifer Boyd
Email & Phone:	jennifer-boyd@utc.edu ; 860-904-8060
Contact & Office Hours:	Students are encouraged to contact me by email as my preferred method of correspondence. I aim to respond to emails within 24 hours on weekdays and within 48 hours on weekends. Online office hours will be on Mondays from 10 am-12 pm via Zoom (https://zoom.us/join) accessed with the following meeting ID: 362 955 7870. Face-to-face office hours will be on Wednesdays from 3-5 pm in my office in Holt 219. Other meetings may be scheduled by appointment as needed.
Course Days, Times, and Location:	This is an online course offered that will be hosted in Canvas. This course will be delivered <i>asynchronously</i> to allow for flexibility in your learning schedule. This means that you have flexibility in choosing the days of the week and times that you access material in Canvas, but you are expected to log into the course several times each week <i>at a minimum</i> to access course content, complete assessments by their due dates, communicate with me as needed, and receive important announcements made during the term. Due dates for all assessments are provided in this syllabus and on Canvas.

Course Catalog Description:

Ecology is the study of how organisms interact with their living and non-living environment. Ecology has many important facets and subdisciplines; we will be discussing some of its most major concepts within the time frame of this semester.

Prerequisite:

BIOL 1110/1120/1130 or ESC 1500/1510 with a minimum grade of C

Course Student Learning Outcomes (CSLOs):

Upon successful completion of this course, students will be able to:

- CSLO 1.** Describe multiple ways in which organisms can interact with their abiotic and biotic environment. *Assessed primarily through quizzes and exams.*
- CSLO 2.** Explain foundational theories, hypotheses, and principles in the field (e.g., Theory of Evolution by Natural Selection, Intermediate Disturbance Hypothesis, Competitive Exclusion Principle). *Assessed primarily through quizzes and exams.*
- CSLO 3.** Categorize ecological research foci into various sub-disciplines of the field as differentiated by levels of biological organization (e.g., organismal ecology, population ecology, community ecology, landscape ecology). *Assessed primarily through quizzes and exams.*
- CSLO 4.** Describe common methodologies used in ecological research (e.g., common garden experiments, population growth models, species diversity indices). *Assessed primarily through quizzes and exams.*
- CSLO 5.** Evaluate the relevance and impact of diverse scientific research to building a dynamic body of ecological knowledge. *Assessed primarily through graded material referencing and incorporating primary literature.*
- CSLO 6.** Provide and defend informed opinions about specific ecological topics of anthropogenic interest. *Assessed primarily through issue-based writing assignments and directed and interactive discussion board activities.*
- CSLO 7.** Articulate ecological information effectively. *Assessed primarily through individual written work and a group-based research proposal presentation.*

Course Materials:

Recommended Text – Molles, MC (2019) *Ecology: Concepts and Applications*, 8th Edition. McGraw-Hill, New York.

Required Additional Readings – Relevant readings from primary (scientific journals) and secondary (common) sources are provided electronically in association with relevant Lessons in the online course space in Canvas. At times, lessons also will include supplementary videos and online content linked in the course space, which you will be expected to view.

Course Technology Requirements:

Hardware – You must have access to a computer with a reliable broadband Internet connection, a speaker (to listen to lectures and other audio content), and a working webcam and a microphone (to take exams) for this online course.

Software – Course materials and information will be made available in Canvas, and you must have access to and use your UTC email account for all correspondence associated with this course. You also should have access to the [Google Chrome](#) web browser to take exams in this course, and a recent version of Microsoft Word and access to [Google Docs](#) and [Google Slides](#) to complete various assignments and activities associated with this course.

[Proctorio](#) software, which is a free extension for Google Chrome, will be used to proctor exams; this program must be installed on your computer prior to taking the exams. Information about Accessibility in Canvas can be found here: <https://www.canvaslms.com/accessibility>. Information about Accessibility in Google products can be found here: <https://www.google.com/accessibility/>.

Information about Accessibility in Proctorio can be found here: <https://proctorio.com/accessibility>. Learn more about the use of Canvas at UTC here: <https://www.utc.edu/walker-center-teaching-learning/canvas.php>

Technology Skills Required:

You should be able to use Canvas, your MOCSNet email account, Google Chrome, Microsoft Word, Google Docs and Google Slides, Proctorio, and a scholarly citations index (e.g., Web of Science or Google Scholar) for this course.

Technology Support:

If you have problems with your UTC email account, Canvas, or other software or tools used in this course contact the IT Solutions Center at 423-425-4000 or email itsolutions@utc.edu.

Software available to UTC students, including access to Microsoft Office products, is listed at <https://www.utc.edu/information-technology/services/software-students.php>. If you have issues with Proctorio, you also are encouraged to contact Proctorio support at 1-877-687-6411.

Accessibility & Accommodation:

If you are a student with a disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) and think that you might need special assistance or a special accommodation in this class or any other class, contact the Disability Resource Center (DRC) at 425-4006. More information can be found at:

<https://www.utc.edu/disability-resource-center/index.php>

Student Support Services:

The Student Support Services office at UTC offers students a range of support services, including tutoring, academic coaching, and writing assistance. You are encouraged to utilize these services toward facilitating your success in this course. Information about Student Support Services and a complete list of the services offered can be found at:

<https://www.utc.edu/student-support-services/sss-services.php>

Course Organization:

This course is structured into four main **Learning Modules**, each covering four related **Lessons**. **Learning Module 1 – Evolution & Natural History** focuses on the Theory of Evolution by Natural Selection as a foundation for the field. The remaining three Modules focus on topics relevant to various subdisciplines of ecology as differentiated by levels of biological organization: **Learning Module 2 – Environmental Adaptations** focuses on organismal-level ecology. **Learning Module 3 – Population Dynamics & Species Interactions** focuses on ecology spanning from population to community levels. **Learning Module 4 – Biodiversity & Global Patterns** continues from the community level to landscape level ecology. Each Learning Module will comprise approximately 3-4 weeks of the course.

Course Assessments and Requirements:

Exams – Each Learning Module will end with an exam consisting of multiple-choice questions, terms to define, and short essay questions to assess your understanding of material specific to that Learning Module. A cumulative final exam of similar style also will be given to assess your understanding of collective course material at the end of the course. **Students must complete (not just begin) each regular exam between 8 AM and 8 PM EST on the due date specified in this Syllabus and the Course Schedule; the Final Exam for this course has been scheduled by UTC for 1-3 PM EST on December 8th.** All exams will be administered through Canvas and will require the use of Proctorio, which is an online proctoring system associated with the Google

Chrome web browser. You will not be able to take an exam if you do not have Proctorio and Google Chrome installed, a working webcam and microphone associated with your computer, and/or if you do not take the exam during the specified exam time. You will have 1 hour to complete each of the three regular exams in this course and 2 hours to complete the final exam. No notes, electronic devices other than your computer, or other materials can be visible or accessed while you are taking an exam. Proctorio will utilize video and audio recordings of you and your test environment and of all activity on your computer screen to determine suspicious behavior. You may study for exams with other students. However, once you begin taking an exam, you may NOT discuss exam material with anyone else prior to 8 PM EST that day. All violations of these policies will be reported to the UTC Honor Court without leniency.

Quizzes – Each Learning Module will include four short quizzes consisting of some combination of multiple choice and true/false questions to assess your understanding of material. Each quiz will be specific to a Lesson. Proctorio will NOT be used to take quizzes. **You must complete all four quizzes in each Learning Module BEFORE 8 AM EST on the corresponding exam date for that Learning Module.** You will have an unlimited amount of time to take each quiz.

Discussion Board Contributions – Each Learning Module will include two opportunities to contribute in a meaningful way to course discussion boards as instructed. Discussion board contributions will consist of informed opinion-based answers to questions and feedback to the responses of your peers to these questions as instructed. You must complete Discussion board assignments as an individual without assistance or input from other students. **Discussion board contributions must be made by 8 PM EST on the due dates specified in this syllabus and the course schedule.**

Writing Assignments – Each Learning Module will include a short (~500 words) written assignment asking you to apply your knowledge to a defined issue of topical relevance. You will be expected to use both information presented in class and independent research to complete these assignments as instructed. Writing assignments are to be completed as an individual without assistance or input from other students. **You must complete written assignments by 8 PM EST on the due dates specified in this syllabus and the course schedule.**

Presentation – Throughout the term you will work with a small group of students to develop a short (~10-12 minutes) online presentation in Google Slides to propose future research on an assigned topic in the field of ecology. Specific assignments associated with your presentation will be incorporated into each Learning Module. These assignments will involve identifying and describing an appropriate published study to inspire your proposed research, coming up with a feasible and well justified research plan, creating slides to

present your proposed research, and narrating your slideshow. Groups and topics will be assigned early in the term so that you can communicate with your group members and arrange to work on your presentation together.

You must complete presentation assignments by 8 PM EST on the due dates specified in this syllabus and the course schedule.

Course Grading:

Course Grading Policy – Your grade will be based on the points you earn on exams, quizzes, discussion board contributions, writing assignments and presentation activities, which will comprise the approximate weighted percentages shown. Grades will be assigned using the standard letter scale (90-100% = A, 80-89.9% = B, 70-79.9% = C, 60-69.9% = D, lower than 60% = F) No extra credit will be awarded, and grades will not be adjusted (e.g., curved or rounded up).

4 Regular Exams (40 points each)	~25% of total points
Final Exam (80 points)	~12.5% of total points
16 Quizzes (10 points each)	~25% of total points
4 Written Assignments (20 points each)	~12.
5% of total points 8 Discussion Board Contributions (10 points each)	~12.
5% of total points 4 Presentation Activities (20 points each)	~12.
5% of total points	

Instructor Feedback & Grading Response Time – I aim to grade all exams, quizzes, and other assessments within one week of the due date and provide feedback when necessary.

Grade Availability – Grades will be made available after I have reviewed and assessed your material submitted for grading. Your grades will be entered in the Grades section of the course space in Canvas.

Course and Institutional Policies:

Course Participation/Contribution – Although this course is being offered asynchronously to allow for flexible scheduling, this is NOT a self-paced course. You are expected to complete scheduled activities and assessments by their due dates specified in this syllabus and the course schedule. This includes timely work on group assignments; do NOT wait until a day or two before the due date of a group assignment to communicate with your group and expect

to be included in work that has already been completed. You should login to the course several times per week *at a minimum* to read your weekly course content and complete assessments as scheduled. You should expect to spend ~10 hours per week on this course.

Late/Missing Work – You are strongly encouraged to complete all assessments prior to their due dates to avoid the negative impact of missed assessments on your final grade. **Make-up assessments will be permitted without penalty only for *legitimate* excuses (e.g., those supported by a note from a doctor, dean, athletic director, or academic advisor) that prohibit your ability to participate in an online course environment.** If you know ahead of time that you will not be able to take a quiz or exam or complete an assignment by the time that it is due for a *legitimate* reason, you must let me know ahead of time so that we can arrange an alternative time for you to take it. If you miss a quiz or exam or assignment due date due to a *legitimate* but unexpected reason, then you must let me know as soon as possible so that we can reschedule. If the reason is *legitimate*, you may make up the quiz or exam or assignment without penalty. Unexcused late quizzes and exams will not be accepted; 0 points will be earned for any unexcused quiz or exam not completed by its due date. Unexcused late assignments will result in a deduction of points equal to one-quarter of the total points possible for the assessment for each day of lateness.

University Delays and Closures – If UTC is closed for any reason, this online course will proceed as usual.

Student Conduct – Students are required to be familiar with and abide by UTC's Academic Integrity Policy, which is stated in the [Student Handbook](#).

Honor Code Pledge – As a UTC student, you are required to abide by its Honor Code: *I pledge that I will neither give nor receive unauthorized aid on any test or assignment. I understand that plagiarism constitutes a serious instance of unauthorized aid. I further pledge that I exert every effort to ensure that the Honor Code is upheld by others and that I will actively support the establishment and continuance of a campus-wide climate of honor and integrity.*

Generative Artificial Intelligence (AI) – All submitted coursework must be your own original work. Inclusion of proper citations, using the accepted citation style for this course, is required per the UTC Honor Code. ***The use and/or inclusion of any materials derived by a Generative AI tool is strictly prohibited.*** Failure to follow any of the aforementioned guidelines constitutes a violation of the Honor Code and will result in a referral to the Office of Student Conduct.

Plagiarism – Written assignments and discussion board entries may be screened with text- matching software that helps to identify plagiarism. To avoid plagiarizing someone else's work, do not copy directly from any

information source, including the Internet. Write in your own words and properly cite your sources. For first offenses, you will fail the assignment. For second offenses, you will fail the course and the offense will be brought to the attention of the UTC Honor Court.

Unauthorized Aid – You must complete writing assignments, discussion board entries, and quizzes as an individual. You may NOT obtain assistance or utilize input from other students on these assessments. You may prepare/study for exams with other students. However, once you begin taking an exam, you may NOT discuss its content (or lack of content) with other students until after 7 pm on the exam due date. You may not utilize any outside materials when taking exams in this course including those that may be accessed through your computer. Any offenses to these course policies will result in failure from the course and will be brought to the attention of the UTC Honor Court.

Course Learning Evaluations – Course evaluations are an important part of our efforts to continuously improve the learning experience at UTC. Toward the end of the semester, you will receive a link to evaluations and are expected to complete them. I value your feedback and

COURSE SCHEDULE

Date	Topic	Materials & Assignments
Course Introduction		
Aug 21-22	Welcome!	• Welcome Video • Discussion Board Introduction – <i>due Aug 23</i> • Read Syllabus • Read ALL 'Start Here!' materials
Learning Unit #1 – Evolution & Natural History (Foundations of Ecology)		
Aug 23-28	1.1. Evolution by Natural Selection	• Lectures 1 & 2 • Levin 2010 article • Quiz 1 • Writing Assignment 1 – <i>due Sept 5</i>

Aug 29-Sept 1	1.2. Coevolution & Mutualism	• Lectures 3 & 4 • Ghazoul 2005 article • Honey Badger video • Quiz 2 • Discussion Board 1 – <i>due Sept 5</i>
Sept 5-8	1.3. Biomes: Overview, Tundra, Boreal Forests	• Lectures 5, 6 & 7 • Quiz 3 • Presentation Assignment 1 – <i>due Sept 15</i>
Sept 11-14	1.4. Biomes: Deserts, Grasslands, Temperate & Tropical Forests	• Lectures 8, 9 & 10 • Ellis 2011 article • Quiz 4 • Discussion Board 2 – <i>due Sept 15</i>
Date	Topic	Materials & Assignments
Sept 15	Exam 1	<i>Available from 8 AM – 8 PM EST</i>
Learning Unit #2 – Environmental Adaptations (Organismal Ecology)		
Sept 18-21	2.1. Temperature Relations	• Lectures 11 & 12 • Razgour et al. 2019 article • Quiz 5 • Writing Assignment 2 – <i>due Sept 28</i>
Sept 22-27	2.2. Water Relations	• Lectures 13 & 14 • Koch et al. 2004 article • Hughes 2015 article • Quiz 6 • Discussion Board 3 – <i>due Sept 28</i>
Sept 28-Oct 3	2.3. Light Adaptations & Photosynthesis	• Lectures 15, 16 & 17 • RIPE Project 2019 video • Quiz 7 • Presentation Assignment 2 – <i>due Oct 10</i>
Oct 4-9	2.4. Energy Flow & Nutrient Cycling	• Lectures 18, 19 & 20 • Quiz 8 • Discussion Board 4 – <i>due Oct 10</i>
Oct 10	Exam 2	<i>Available from 8 AM – 8 PM EST</i>

Learning Unit #3 – Population Dynamics & Species Interactions (Population & Community Ecology)		
Oct 11-19	3.1. Life Histories	• Lectures 21 & 22 • Georgiou 2019 article • Waterfield 2019 feature • Quiz 9 • Writing Assignment 3 – <i>due Oct 26</i>
Date	Topic	Materials & Assignments
Oct 20-25	3.2. Geometric & Exponential Population Growth	• Lectures 23 & 24 • Practice Problems • Quiz 10 • Discussion Board 5 – <i>due Oct 26</i>
Oct 26-31	3.3. Logistic Population Growth	• Lectures 25 & 26 • Schiermeier 2002 article • Quiz 11 • Presentation Assignment 3 – <i>due Nov 7</i>
Nov 1-6	3.4. Competition & Other Interactions	• Lectures 27 & 28 • Lotka-Volterra video • Quiz 12 • Discussion Board 6 – <i>due Nov 7</i>
Nov 7	Exam 3	<i>Available from 8 AM – 8 PM EST</i>
Learning Unit #4 – Biodiversity & Global Patterns (Community & Landscape Ecology)		
Nov 8-13	4.1. Community Diversity	• Lectures 29, 30 & 31 • Ripple & Larsen 2000 article • Quiz 13 • Writing Assignment 4 – <i>due Nov 20</i>
Nov 14-17	4.2. Ecological Succession	• Lectures 32 & 33 • PBS NOVA 2014 Video • Quiz 14 • Discussion Board 7 – <i>due Nov 20</i>

Nov 20-28	4.3. Variations of Succession	• Lectures 34 & 35 • Quiz 15 • Presentation Assignment 4 – <i>due Dec 4</i>
Nov 29-Dec 4	4.4. Large-scale Patterns of Biodiversity	• Lecture 36 & 37 • Myers et al. 2000 article • Quiz 16 • Discussion Board 8 – <i>due Dec 4</i>
Date	Topic	Materials & Assignments
Dec 4	Exam 4	<i>Available from 8 AM – 8 PM EST</i>
Dec 8	Final Exam	<i>Available from 1 – 3 PM EST</i>

Appendix 1-G

Revised curriculum map for Environmental Science

The SLO numbers correspond to the new SLOs present in section 1.3.1. Environmental Science Learning Outcomes. I – Program SLO is introduced and assessed, R – Program SLO is reinforced and assessed, C – Level of competency is assessed.

Environmental Science Key I = Introduce R = Reinforce C = Competence	SLO1 Core Knowledge. Students demonstrate interdisciplinary knowledge of core areas of environmental science (e.g., ecology, natural resources, law and policy, ethics, etc.) as they apply to understanding the natural world and addressing environmental issues, including human population growth, resource depletion, urbanization, pollution, and sustainability.	SLO2 Resources and Tools. Students use resources within an environmental science context to collect information, including the literature base, established methodologies and technologies, laboratory and field equipment, and/or computational tools.	SLO3 Scientific/Research Process. Students ask and address questions in environmental science by developing questions and/or hypotheses, designing and conducting relevant investigations with empirical, theoretical, and/or conceptual tests, and critically analyzing and interpreting results.	SLO4 Communication and Engagement. Students disseminate environmental science information in various formats (i.e., oral, written) and engage with various audiences (i.e., scientific, general) as is essential to career development in the discipline.	
	ESC 1500 Intro to ESC I	I	I	I	I
	ESC 1510 Intro to ESC 2	I	I	I	I
	BIOL 1110 Prin BIOL 3	I	I	I	I
	BIOL 1120 Prin BIOL 2	I	I	I	I
	GEOL 2100 Intro GIS & Rem Sens	I	I	I	I
	BIOL 3060 Ecology	R	R		R
	BIOL 3070 Ecology L		R	R	R
	ESC 4100 Law	I/R/C	R	R	R/C

ESC 4840 Values Envir	R			R
ESC 4800 Seminar	R/C	R	R	R
ESC 4900 Senior Proj	C	C	C	C
ESC 4910 Internship	R/C	R/C	R/C	R/C
ESC 4920 Advance GIS		R/C	R/C	R/C
ESC 4960R Env Field C	C	C		
ESC 4995r Dept Thesis	C	C	C	C
ESC 4997 Research	C	C	C	C
ESC 4998 Ind Studies	R/C	R/C	R/C	
BIOL 1130 Prin BIOL 3	I		I	
BIOL 3250 Genetics	R	RC	R	R
BIOL 3350 Evolution	R			
ESC 2500 World Res	R			R
GEOL 2250 Oceanography	I	I	I	I
ESC 3400 Survey Meth	C	C	C	C
ESC 3600 Air Water Pol	R			R
ESC 4520 Limnology	C	C		
ESC 4650 Remote Sens	R/C	R/C	R/C	R/C
BIOL 4020 Meio Biodiversity	C	C	C	C
BIOL 4050 Comp Vert Zool		C		C
BIOL 4070 Entomology	C	C		C

BIOL 4090 Herpetology	C	C	C	C
BIOL 4110 Ichthyology	C	C		
BIOL 4130 Invnt Zoology	C	C		C
BIOL 4140 Mammalogy	R	C		C
BIOL 4150 Mycology	R	R/C	R	R/C
BIOL 4170 Ornithology	C	R/C	R	R
BIOL 4180 Plant Morphology	C	C	R	R
BIOL 4190 Plant Taxonomy	C	C	R	R
BIOL 4680 Intro to Soil Resources		C	R/C	C
BIOL 4750 Dendrology	R/C	R	R	C
BIOL 4085 Parasitology	C	C		C
BIOL 4310 Behav Eco	R		C	C
BIOL 4335 Wild Educ and Rehab	R	C	R	C
BIOL 4410 Animal Behavior	C	C	C	
BIOL 4420 Biogeography	C	C	R	R
BIOL 4430 Bioremed	C	C	C	R
BIOL 4480 Ant Ecology	R	C	C	C
ESC 4460 Global Ch B	C	C		C
BIOL 4530 Microbial E	C	C		
BIOL 4540 Plant Ecology	C	C	C	C

BIOL 4620 Economic Bot	R/C	R	R	C
ESC 4070 Env Conserv	C		R	
ESC 4300 Prob Env Ma	C		C	C
ESC 4325 Wild Admin and Policy	C			C
ESC 4330 Prin & Mgt of Wildlife Dis	C	C	C	
ESC 4400 Trop Marine Eco	C	C	C	
ESC 4460 Glob Change BIOL	C	C		C
ESC 4470 Eco and Evo Stats	C	C	C	C
ESC 4512 Amp Eco and Cons	C	C		C
ESC 4514 Rep Eco and Cons	C	C		C
GEO 4530 GIS for Geoscientists	R	C	C	C
ESC 4650 Geographic Info Sys	C	C	C	C
ESC 4960R Env Field C	C	C		
GEO 4450 Hydrology	C	R		
BIOL 4200 Molecular Genetics	R/C	R/C	R/C	R/C
BIOL 4280 Cell Biology	C	C	C	
BIOL 4340 Hum Dev. And Dis	C	C		

BIOL 4440 Dev. Vert Emb	C	C		
BIOL 4720 Immunology	C	R	R	R
ESC 4380 Toxicology		C	C	
ESC 2010 Justice, Policy, and En	I	I	I	R
GEOL 1110/L Physical GEOL	I			
GEOL 1105L Eath and Envir Lab	I	I	I	
GEOL 1120/L Historical GEOL	I	I		
GEOL 3410 Mineralogy		I	I	I
GEOL 3420 Petrology	R	R		
GEOL 3220 Soil Prop, Genesis...	I	R	R	
GEOL 4070 Dynamic Earth	C	C		
GEOL 4080 Earth Surface Proc	I	R	R	
GEOL 4550 RS for Geoscientists	R	C	C	C
ESC 4010 Micro Ecol	R	C	C	C
ESC 4430 Bioremediation	C	C	C	R

Appendix 1-H

The University of Tennessee at Chattanooga

Introduction to Environmental Problems II Laboratory Fall 2023 (8/21-12/12)

ESC 1510L Sec 01 (CRN 43301), 0 Credit Hours; W 2:00 – 3:50

ESC 1510L Sec 02 (CRN 40503), 0 Credit Hours; R 1:40 – 3:30

Check your Section # and CRN # ...

Instructor: Dr. Bradley R. Reynolds

Email and Phone Number: Bradley-Reynolds@utc.edu; 423-425-2247

Office Hours and Location: Holt 232J, MWF 10-11

Course Meeting Days, Times, Location: W 2:00 PM - 3:50 PM, Holt 225 OR R 1:40-3:30, Holt 225

Course Catalog Description: An introduction to systematic ways in which the human mind comprehends the natural world; emphasis on studies of living systems, natural processes, and related phenomena including a focus on local environmental problems. Topics covered include a detailed study of the history of conservation, loss of biodiversity, conventional and organic agriculture, water pollution, global climate change, and environmental legislation. The laboratory is a combination of hands-on experiment and field activities. Lecture 3 hours, laboratory 2 hours. Prerequisite: ESC 1500 with a minimum grade of C or department head approval. Corequisite: ESC 1510L or department head approval. Laboratory/studio course fee will be assessed.

Course Pre/Co Requisites: Prerequisite: ESC 1500/1500L with a minimum grade of C ... Corequisite: ESC 1510 Lecture

IF YOU TAKE LAB YOU MUST ALSO TAKE LECTURE AND VISE VERSA! It is impossible to take one without also taking the other ... Course Student Learning Outcomes:

Course Objectives:

To learn principles and concepts in support of the material presented in lecture, and in some cases, to learn principles and concepts intended to expand upon the material presented in lecture.

LIKEWISE ...

Students are able to demonstrate knowledge of the natural world, within the context of key issues of environmental science (including human population increase, urbanization, sustainability, resource depletion, and environmental pollution).

Students are able to demonstrate knowledge of core areas of environmental science (including ecology, survey methodology, environmental resources, environmental law and policy, and environmental ethics) as they exemplify the interdisciplinary nature of the field.

Students are able to apply their knowledge towards addressing environmental problems, in a manner consistent with recognizing the unique role humans play in the environment.

Students are able to formulate research questions and/or hypotheses, utilize appropriate methodologies, and collect and analyze data toward addressing their questions and/or hypotheses within an environmental context.

Students are able to communicate environmental science information effectively.

Students are able to retrieve specific information from the relevant literature and are able to evaluate the literature effectively and critically.

Students are able to conduct themselves responsibly and recognize the importance of ethical professional behavior.

General Education Statement:

This syllabus is tentative and is subject to change and/or revision throughout the course of the semester. This course fulfills a general education requirement in the Natural Sciences category.

Natural Science Student Learning Outcomes (Lecture):

- 1. Students will explain how scientific knowledge develops over time as new evidence emerges.**
- 2. Students will demonstrate scientific literacy by locating, evaluating, interpreting, and applying scientific information/data.**
- 3. Students will explain how scientific developments impact society.**

Corequisite Lab Courses (Lab):

- 1. Students will demonstrate the connection between scientific theory and application.**
- 2. Students will apply the methods of science by testing**

hypotheses and reporting the results.

ATTENDANCE IS REQUIRED!

Required Course Materials: A scientific calculator and a 9 $\frac{3}{4}$ inch x 7 $\frac{1}{2}$ inch composition notebook (green cover with **graph paper** pages). This notebook is available at the book store. This notebook will serve as your field journal/lab notebook and as a place for you to take notes and engage in critical reflection.

Technology Requirements for Course: CANVAS: You are required to use the UTC online course delivery system to access documents, assignments, occasional readings, and grades for this course. Go to <https://www.utc.edu/learn/> and log in with your username and password. Your username is shown on your UTC ID card.

Technology Skills Required for Course: The ability to use Canvas/UTCLearn and the ability to competently navigate the Internet are crucial.

Technology Support: If you have problems with your UTC email account or with UTC Learn/Canvas, contact IT Solutions Center at 423-425-4000 or email itsolutions@utc.edu.

Course Assessments and Requirements/Course Grading/Course Grading Policy:

The lecture grade will count 75% and the lab grade will count 25% of the total course grade. This course will have at least a 20% writing component. YOU CANNOT SIGN UP FOR LECTURE WITHOUT ALSO SIGNING UP FOR LAB. If you take one, you must also take the other.

Grading: Please note that attendance is mandatory and that no late work will be accepted. Also please note that this class in combination with lecture satisfies a general education requirement in the Natural Sciences Category (therefore an extensive amount of writing will be required, accounting for at least 20% of the overall course grade).

You will be required to keep a traditional field journal. First off, write down everything in your field journal (including class notes), since you will use the journal in conjunction with handouts to study for the midterm and the final. You will also use the information recorded in your field journal to write a formal lab report. I recommend putting all of your class notes AND any entries you make for each experiment or activity sequentially in the notebook. Just make sure that each page is numbered and the table of contents complete. SEE THE EXAMPLE FIELD JOURNALS.

For each experiment (UNLESS OTHERWISE DIRECTED), include in your lab notebook/field journal an appropriate title and the notes taken in lab that day. Then record your results ... for example, detailed observations, carefully constructed data tables (where you can record the raw data for each experiment), any important calculations, and so on. Finally, provide a **short** written discussion (at least $\frac{1}{2}$ to 1 full page) and a one to two sentence conclusion statement. In summary, each and every lab entry in your lab notebook MUST have the following:

1. An Appropriate Title
2. The Day's Notes (From my Pre-Lab Talk) ... (Perhaps Followed by a Hypothesis for some of the Labs)
3. Results ... Including Observations/Raw Data/Data Tables/Calculations/Graphs/Statistics/etc.
4. Discussion of Results/Answers to Assigned Questions
5. Conclusions (ONE TO TWO SENTENCE STATEMENT)

Your instructor will take your field journal periodically in order to grade it for thoroughness and completeness. **Any entry into the field journal must be legible.**

Please note that towards the end of the semester, you will use the information in your field journal to prepare one brief yet thorough FORMAL lab report. This lab report must be typed. Your lab report should have:

1. An Appropriate Title
2. A Purpose Statement and Brief Introduction (with Hypothesis)
3. Materials List and Procedure
4. Data Tables
5. Results: Observations/Calculations/Graphs/Statistics/Detailed Map
6. Discussion of Results (ONE HALF PAGE to ONE PAGE IN LENGTH)
7. Conclusions (ONE TO TWO SENTENCE STATEMENT)
8. References, if any, in the indicated style

Your grade will be determined as follows:

Attendance	070 pts

Field Journal Check 1 (15 pts) and Check 2 (15 pts)	030 pts

Lab Report	100 pts

Midterm Examination	100 pts

Comprehensive Lab Final	<u>100 pts</u>

400 pts

90-100%	A
80-89%	B
70-79%	C
60-69%	D
Below 60%	F

Your lab grade will make up 25% of your overall grade for the course!

Instructor Grading and Feedback Response Time: Usually I have tests and assignments graded in no more than a week ...

Course and Institutional Policies

Late/Missing Work Policy: Late work and missed assignments are not accepted.

Student Conduct Policy: UTC's Academic Integrity Policy is stated in the [Student Handbook](#)

Student Expectations - I have four main expectations for students in my class:

1. **Students are to arrive to class on time.** If, *on occasion*, you are late, please sit in a chair near the door so you will cause minimal disturbance.
2. **Cells phones are to be turned off during class.** If you need your phone because of an emergency situation, let me know before class starts.
3. **There is no talking during lectures or videos.** There will be opportunities throughout the semester for class discussion. Talking while I'm lecturing is rude and distracting, both to me and to other students. I would rather you not come to class at all then to talk while I am lecturing.
4. **Everyone is to do their own work.** No cheating. If I catch anyone cheating, those individuals will receive no leniency.

Basically, I just expect for everyone to be courteous and polite. If you treat me in a courteous and polite manner, I will treat you in a similar manner.

You are expected to respect me and other students. If you do not follow these guidelines, I will tell you to leave my class.

Honor Code Pledge: I pledge that I will neither give nor receive unauthorized aid on any test or assignment. I understand that plagiarism constitutes a serious instance of unauthorized aid. I further pledge that I exert every effort to ensure that the Honor Code is upheld by others and that I will actively support the establishment and continuance of a campus-wide climate of honor and integrity.

Course Attendance Policy: *Attendance is Required!*

Course Participation/Contribution: Class participation in group discussions and lectures is not required but is highly encouraged.

Course Learning Evaluation: Course evaluations are an important part of our efforts to continuously improve the learning experience at UTC. Toward the end of the semester, you will receive a link to evaluations and are expected to complete them. We value your feedback and appreciate you taking time to complete the anonymous evaluations.

Course Calendar/Schedule:

Date	Topic	Activity
8/23 8/24	Basic Skills	Keeping a Field Journal/Writing a Lab Report HYPOTHESIS WRITING EXERCISE – 5 pts EX1: Introduction and Lab Format
8/30 8/31	Biodiversity	Fossil Video/Exercise - 5 pts Sketch and Measure ... and Answer Some Questions ...

9/6	Biodiversity	Community Structure - 5 pts	A NEW LAB! OUTSIDE!
9/7			

**TEACHING ASSISTANTS MUST PREPARE FLY VIALS TODAY
!!!!!!!!!!!!!!!!!!!!**

9/13	Conservation History	Video: <i>Rachel</i>
Carson's <i>Silent Spring</i> - 5 pts 9/14		

9/20

Basic Skills
Statistics - 5 pts for EXCEL exercises (part of

Second Notebook Check)

**Perform hand calculations directly in notebook. Staple EXCEL
print-outs directly in notebook.**

9/27	Population Growth	Population Dynamics - 5 pts
9/28		HYPOTHESIS REQUIRED EX8: Population Dynamics

10/4	Mid-Term Exam	TURN IN LAB NOTEBOOK FOR FIRST NOTEBOOK CHECK!
10/5		

10/11	Toxicology	Determination of a Simple LD50 Using Water Fleas - 5 pts
10/12		https://www.youtube.com/watch?v=eIZr7M-kt2s

10/18	Air Pollution	Air Pollution Assay with Lichens - 5 pts
10/19		HYPOTHESIS REQUIRED https://www.youtube.com/watch?v=7WYvvAO9H4M https://www.youtube.com/watch?v=CY4kTP16e48 https://www.youtube.com/watch?v=CzxqdwZejZA

10/25	Biodiversity, Basic Skills	Dichotomous Keys! – 5 pts
10/26		Arboretum Scavenger Hunt! – 5 pts NEW! OUTSIDE!

11/01	Basic Skills	Transect Lines and Sampling (Compass Use)
11/02	Air Pollution	Carbon Sequestration - UTC Trees (OUTDOORS) - 5 pts OUTSIDE!

11/08	Basic Skills	Transect Lines and Sampling
	Air Pollution	Carbon Sequestration - UTC Trees (CALCULATIONS) - 5 pts

11/15 – 5 pts	Agriculture OUTDOORS! 11/16	Field Trip to Crabtree Farms

OR A ONE PAGE REPORT ON AN
ORGANIC FARMING PRACTICE WITH
AT LEAST THREE CITATIONS ...
SINGLE SPACED.

FINAL EXAM REVIEW

11/22	NO CLASS – THANKSGIVING BREAK

11/23

11/29	Final Exam, Lab Report Due, Final Notebook Check

11/30

HOLIDAYS: November 24-Thanksgiving (no class)

ADVISEMENT/ACADEMIC SUPPORT SERVICES RESOURCES FOR STUDENTS/KEY RESOURCES AND LINKS

- Center for Advisement and Student Success: <http://www.utc.edu/center-advisement-student-success/>
- Tutoring: <http://www.utc.edu/center-advisement-student-success/academic-success/tutoring.php> and <http://www.utc.edu/college-business/resources/tutoring.php>
- Supplemental Instruction: <http://www.utc.edu/center-advisement-student-success/academic-success/si-groupstudy.php>
- Academic Calendar: <http://www.utc.edu/records/calendars-and-schedules/index.php>
- Final Exam Schedule: <http://www.utc.edu/records/calendars-and-schedules/index.php#FS>
- Undergraduate Catalog: <http://www.utc.edu/records/course-catalogs.php>
- Records/Registrar: <http://www.utc.edu/records/>
- UTC Bookstore: <http://www.utc.edu/auxiliary-services/bookstore.php>
- UTC Library: <http://www.utc.edu/library/>

ENVIRONMENTAL LAW AND AGENCIES

Fall 2023

Department of Biology, Geology, and
Environmental Science ESC 4100,
CRN 45259, Face-to-Face Course, 3
credit hours

Instructor: John C. Tucker

Email: John-Tucker@utc.edu

Phone Number: 423-425-4341

Office Hours and Location: T, Th 3:00-3:50pm; W 10:30-11:20 pm, and by
advance appointment. Location: 232K Holt Hall

Course Meeting Days, Time, and Location: T,Th 9:25a.m. - 10:40a.m., Room 230 Holt Hall

Course Catalog Description: Survey of national, state, and local environmental agencies, and provisions of environmental laws and ordinances at all levels of government. Emphasis on National Environmental Policy Act (NEPA). Analysis and composition and environmental impact statements. Prerequisite: senior standing or department head approval.

Course Pre/Co Requisites: Senior standing or department head approval.

Course Student Learning Outcomes:

1. To introduce students to the history and foundations of environmental law, including common law.
2. To examine the roles of the legislative, executive, and judicial branches of government in development, implementation, and enforcement of environmental law and policy.
3. To provide students with an overview of the major federal environmental laws and contemporary environmental law issues.
4. To enhance student understanding of the role of law and policy in regulation and management of natural resources and the environment.
5. To explore how science interfaces with political, legal, social, economic, and institutional factors.
6. To enhance student's critical thinking and written communication skills by

teaching students to
apply environmental laws to hypothetical scenarios in essay exam questions.

7. To enhance student's critical thinking skills by engaging students in evaluation of the strengths and weaknesses of the major federal environmental laws.

8. To enhance student's critical thinking and verbal communication skills by participating in a mock public meeting concerning environmental law.

Required Course Materials:

1. ENVIRONMENTAL LAW AND POLICY, Salzman and Thompson (5th ed. 2019) (ISBN: 978-1-68328-790-

2) (available in UTC bookstore).

Supplemental Course Materials

Additional Materials will be posted on the class CANVAS site.

Technology Requirements for Course: Computer, CANVAS, internet, email, and possibly Zoom.

Technology/Digital Literacy Skills Required for Course: Ability to use and communicate effectively using the technology listed above (computer, word processing, CANVAS, internet, email, and Zoom).

Technology Support: If you have problems with your UTC email account or with UTC Learn (Canvas), contact IT Help Desk at 423-425-4000 or email helpdesk@utc.edu.

Course Assessments and Requirements:

Attendance and In-class participation: All students are expected to attend and participate in class. You should be prepared to discuss assigned readings and other matters in class. You are required to participate in in-class exercises including the capstone assignment, contribute to in-class critical thinking question discussions, and complete homework and other assignments.

Assessments include

- **Exams:** There are three exams administered during the semester. Exam questions may be multiple choice, fill in the blank, short answer, and essay. There is no final exam.
- **Homework Assignments:** This course covers a large volume of material. Homework assignments are intended to engage you in the course

content and build your critical thinking skills. Homework assignments will be announced in class and on CANVAS at least one week prior to the due date. All homework answers must be typed and turned in online through CANVAS.

- o **Plagiarism - If plagiarism is detected, you will receive a zero for the assignment. If detected a 2nd time, you will fail the course.**
To avoid plagiarizing, write using your own words, properly cite your sources, and never copy and paste from the internet or from the work of others.
- **Capstone Assignments:** There will be a major in-class exercise near the end of the semester simulating a public meeting involving environmental law and policy issues. You will be provided materials and roles for the exercise. You must participate and speak during this exercise to receive credit. You must also submit an outline of the major points you intend to make during the exercise.

Your final grade in the class is based on the following components and weights:

3 Exams (25% each)	75%
Homework Assignments	10%
Capstone Assignments	15%
Total	100%

Course Grading

Course Grading Policy: Grades are based upon the three exam scores, homework assignments, in- class quizzes and exercises, and participation in the in-class capstone assignment.

A 90 - 100 points, B 80-89 points, C 70-79 points, D 60-69 points, F 0-59 points

Instructor Grading and Feedback Response Time: Exams will be graded and returned within two weeks of being administered. I will try my best to grade quizzes and homework within 1-1.5 weeks of the due date.

Course and

Institutiona

I Policies

Missed/Ma

keup

Exams:

There will be NO EARLY EXAMS OR MAKE UP EXAMS, except under extenuating circumstances as determined by the professor and **ONLY** if you **are granted permission from the professor prior to the exam**. Otherwise, you will earn a zero for missed work.

Late or Missed Assignments:

A zero will be recorded for missed homework assignments and included in final course grade calculation. Late assignments are not allowed without approval of the instructor. There are no exercise makeups.

Student Conduct Policies: Students must comply with UTC's [Honor Code](#) and [Code of Conduct](#).

Honor Code Pledge: As a student of the University of Tennessee at Chattanooga, I pledge that I will not give or receive any unauthorized assistance with academic work or engage in any academic dishonesty in order to gain an academic advantage. I will exert every effort to insure that the Honor Code is upheld by myself and others, affirming my commitment to a campus-wide climate of honesty and integrity.

Honor Code Violations: Violation of the honor Code will result in an automatic zero on the assignment or exam, an F in the class, and referral to UTC Honor Court.

Course Attendance Policy: You are required to attend face-to-face class meetings and participate in class discussions during class meetings, including the in-class capstone assignment.

Cell Phones & Other Electronic Equipment: Turn off your cell phone or other electronic equipment before you enter class. Sending or receiving text messages or calls is distracting and you will be asked to leave class if you engage in this activity. You may use a laptop to take notes.

Course Participation/Contribution: In the classroom, students are expected to arrive on time to every class and stay until dismissal, ask and answer questions, and keep phones on silent and out of sight. Participation in in-class activities will count toward your final grade. Out of the classroom, students are expected to regularly check the Canvas Announcements and MOCSNet email, read relevant textbook pages, complete all homework assignments, and study a minimum of 6 hours per week. See course assessments and requirements section of this syllabus.

Student Accommodations: If you have accessibility and accommodation requests, contact the [Disability Resource Center](#) at 423-425-4006 or email DRC@utc.edu.

UTC Campus Syllabus: Students must review and comply with all provisions of the UTC Campus Syllabus.

The UTC Campus Syllabus is posted in the CANVAS site for this course.

Course Calendar/Schedule:

**ESC 4100
Environmental Law
and Agencies Course
Outline**

The outline and assignments are subject to change and it is the responsibility of the student to keep informed of changes, new materials, missed content.

A. Introduction

1. American Legal System
2. Levels of Government
3. Perspectives and Approaches to Protect the Environment
4. History of Environmental Law

B. Administrative Law

1. Agencies
2. Agency Authority and Limitations
3. Standing

C. Comprehensive Environmental Policy and Assessment – National Environmental Policy Act (NEPA)

D. Natural Resource Conservation and Protection

1. Biodiversity Conservation – Endangered Species Act (ESA)
2. Biodiversity Conservation at State and Local Level (Econlockhatchee River Case Study)
3. Wetlands – Section 404 Dredge and Fill Program (CWA)
4. Water Quantity – Tennessee Interbasin Water Transfer Act)

E. Pollution Control

1. Water Pollution - Clean Water Act (CWA)
2. Air Pollution - Clean Air Act (CAA)
3. Solid and Hazardous Wastes - Resource Conservation and Recovery Act (RCRA)
4. Hazardous Substances - Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

- F. Land Use Control and Development
1. Comprehensive Planning
 2. Zoning
 3. Land Development Regulation

**ESC 4100
Environmental Law and
Agencies TENTATIVE
CLASS SCHEDULE AND
ASSIGNMENTS***

Wk	Day	Date	Topic	Assignment
1	T	8/22	Course Overview & Intro to Law, American Legal System	Review Syllabus
	Th	8/24	Intro to law, Perspectives	Read pages 1-15, 17-28, 42-46 <u>Study/Discussion Questions 1</u>

2	T	8/29	Administrative Law	Read pages 65-75, 78-88, 91-111 <u>Homework 1</u>
	Th	8/31	National Environmental Policy Act (NEPA)	Read pages 339-354 <u>Study/Discussion Questions 2</u>
3	T	9/5	NEPA continued.	<u>Study/Discussion Questions 3</u>
	Th	9/7	Endangered Species Act (ESA)	Read pages 293-313
4	T	9/12	ESA continued	<u>Study/Discussion Questions 4</u>
	Th	9/14	Econlockhatchee River Case Study	TBA
5	T	9/19	Econlockhatchee River Case Study	
	Th	9/21	EXAM 1	
6	T	9/26	Clean Water Act Section 404 – Dredge and Fill Program (Wetlands)	Read pages 275-293 <u>Homework 2</u>
	Th	9/28	CWA Section 404 continued	
7	T	10/3	Tennessee Interbasin Water Transfer Act	TBA
	Th	10/5	Tennessee Interbasin Water Transfer Act	
8	T	10/10	Clean Water Act (CWA) – Pollution Control	Read pages 175-204 <u>Homework 3</u>
	Th	10/12	CWA	
9	T	10/17	Fall Holiday	
	Th	10/19	CWA	
10	T	10/24	EXAM 2	
	Th	10/26	Clean Air Act (CAA)	Read pages 115-142
11	T	10/31	CAA continued	<u>Homework 4</u>
	Th	11/2	Resource Conservation and Recovery Act (RCRA)	Read Salzman and Thompson, pages 235-251
12	T	11/7	RCRA continued	
	Th	11/9	Comprehensive Environmental Response, Compensation, & Liability Act (CERCLA)	<u>Study/Discussion Questions 5</u>
13	T	11/14	CERCLA continued	
	Th	11/16	Land Use Control and Development	TBA

14	T	11/21	Land Use Control and Development	TBA
	Th	11/23	Thanksgiving	TBA
15	T	11/28	Capstone Assignment	TBA
	Th	11/30	Exam 3 (Last Class)	

*This schedule may be adjusted depending upon the progress of the class, student needs, and new developments in environmental law. It is the responsibility of the student to keep informed of changes, new materials, and missed content.

Introduction to Environmental
Problems I LABORATORY Fall
2023 (8/21-12/12)
**ESC 1500L Sec 03 (CRN 40497), 0
Credit Hours**

Teaching Assistant or Adjunct or Regular

Faculty: Amy Johnson Email and Phone

Number: fvw423@mocs.utc.edu; 972-467-3978

Office Hours and Location: Holt 210, M (12-1:30) and W (12-4:30)

Course Coordinator and/or Instructor of Record:

Dr. Bradley R. Reynolds **Email and Phone Number:**

Bradley-Reynolds@utc.edu; 423-425-2247 **Office**

Hours and Location: Holt 232J, M (2-4) and WF (10-11)

Course Meeting Days, Times, and Location: Holt 225, T (10:50am- 12:40pm)

Course Catalog Description: An introduction to systematic ways in which the human mind comprehends the natural world; emphasis on studies of living systems, natural processes, and related phenomena including basic ecological principles and environmental problems at local, national, and global levels. Topics to be covered include evolution, ecosystems, human overpopulation, biodiversity, energy sources, solid waste, and pollution of air, water, and soil. The laboratory integrates the scientific approach and provides hands-on experience in identification of abiotic and biotic factors affecting environmental quality. Lecture 3 hours, laboratory 2 hours. Prerequisite: MATH 1006 or MATH 1130 or MATH 1710 or MATH 1720 or MATH 1830 or MATH 1910 and MATH 1911 with a minimum grade of C or Math ACT score of 22 or above or department head approval. Co-requisite: ESC 1500 or department head

approval. Laboratory/studio course fee will be assessed.

Course Pre/Co Requisites: MATH 1006 or MATH 1130 or MATH 1710 or MATH 1720 or MATH 1830 or MATH 1910 and MATH 1911 with a minimum grade of C or Math ACT score of 22 or above or department head approval. Co-requisite: ESC 1500 or department head approval. **IT IS IMPOSSIBLE TO TAKE LAB WITHOUT ALSO TAKING LECTURE and VISE VERSA!**

Course Objectives:

To learn principles and concepts in support of the material presented in lecture, and in some cases, to learn principles and concepts intended to expand upon the material presented in lecture.

LIKEWISE ...

Students are able to demonstrate knowledge of the natural world, within the context of key issues of environmental science (including human population increase, urbanization, sustainability, resource depletion, and environmental pollution).

Students are able to demonstrate knowledge of core areas of environmental science (including ecology, survey methodology, environmental resources, environmental law and policy, and environmental ethics) as they exemplify the interdisciplinary nature of the field.

Students are able to apply their knowledge towards addressing environmental problems, in a manner consistent with recognizing the unique role humans play in the environment.

Students are able to formulate research questions and/or hypotheses, utilize appropriate methodologies, and collect and analyze data toward addressing their questions and/or hypotheses within an environmental context.

Students are able to communicate environmental science information effectively.

Students are able to retrieve specific information from the relevant literature and are able to evaluate the literature effectively and critically.

Students are able to conduct themselves responsibly and recognize the importance of ethical professional behavior.

General Education Statement:

This syllabus is tentative and is subject to change and/or revision throughout the course of the semester. This course fulfills a general education requirement in the Natural Sciences category.

Natural Science Student Learning Outcomes (Lecture):

1. **Students will explain how scientific knowledge develops over time as new evidence emerges.**
2. **Students will demonstrate scientific literacy by locating, evaluating, interpreting, and applying scientific information/data.**
3. **Students will explain how scientific developments impact society.**

Corequisite Lab Courses (Lab):

1. **Students will demonstrate the connection between scientific theory and application.**
2. **Students will apply the methods of science by testing hypotheses and reporting the results.**

ATTENDANCE IS REQUIRED!

Required Course Materials: You are required to purchase and bring to class the following lab manual: A Laboratory Manual for Introduction to Environmental Science (2014), Second Edition, by Ford and Reynolds, Kendall Hunt Publishing. You are required to bring a scientific calculator to every session. You will find certain lab activities extremely difficult without a calculator. Some cell phones have calculator capabilities; however, cell phones will not be allowed during a quiz or exam.

Technology Requirements for Course: Canvas: You are required to use the UTC online course delivery system (Canvas) to access various materials and grades for this course. Go to <https://www.utc.edu/learn/> and log in with your username and password. Your username is shown on your UTC ID card.

Technology Skills Required for Course: The ability to use Canvas and the ability to competently navigate the Internet are crucial.

Technology Support: If you have problems with your UTC email account or with UTC Learn, contact IT Solutions Center at 423-425-4000 or email itsolutions@utc.edu.

Course Assessments and Requirements/Course Grading/Course Grading Policy:

The lecture grade will count for 75% and the lab grade will count for 25% of the total course grade. The course will have at least a 20% writing component. YOU CANNOT SIGN UP FOR LECTURE WITHOUT ALSO SIGNING UP FOR LAB. If you take one, you must also take the other.

The lab grade will

break down

as follows:

Quizzes	40 pts		
Data Sheets/Attendance	60 pts		
Midterm	50 pts		
<u>Final</u>	<u>50 pts</u>	Total Points Available	200 pts

Your grade is based on the percentage of points earned out

of 200 AVAILABLE points: 90-100% A

80-89% B

70-79% C

60-69% D

Below 60% F

QUIZZES – There will be two quizzes over the course of the semester, each worth 20 points. All answers on all quizzes must be made in complete sentences in order to receive credit. The quiz questions will assess more than just straight memorization. On the quizzes, you will be expected to demonstrate UNDERSTANDING of the material from lab. NO MAKE UP QUIZZES WILL BE GIVEN.

DATA SHEETS – Each week before you leave, after the completion of the experiment, you will turn in the data sheet from the day's experiment. These data sheets will address topics and activities covered/completed during lab that day. The data sheets you complete will be used in part to monitor your attendance. The data sheets are worth 5 points each in most cases. You must complete the data sheets in their entirety in order to do well on the quizzes and exams. All answers on all post-lab questions must be made in complete sentences in order to receive credit. Average work on a data sheet or data sheets will earn a 2 or 3 (out of 5). Work that is considered good to excellent will earn a 4 or 5 (again, out of 5). **NO MAKE UP LABS WILL BE GIVEN.**

MIDTERM – A midterm exam (worth 50 points) will be given over all material covered to that point. There will be no multiple-choice questions on the midterm. Complete sentences will be required.

FINAL – There will likewise be a final at the end of the semester worth 50 points. Again, complete sentences will be required. The Final is not cumulative but will instead cover the material from the second half of the semester.

Instructor Grading and Feedback Response Time: Usually tests and assignments will be graded in a week ...

Course and Institutional Policies: SEE THE POSTED 'CAMPUS

SYLLABUS!' Late/Missing Work Policy: Late work and missed assignments are not accepted.

Student Conduct Policy: UTC's Academic Integrity Policy is stated in the [Student Handbook](#)

Student Expectations - I have four main expectations for students in my class:

1. **Students are to arrive to class on time.** If I can be on time every week, then you can as well.
2. **Cells phones are to be turned off during class.** If you need your phone because of an emergency situation, let me know before class starts.
3. **There is no talking during lectures or videos.** Talking while I'm lecturing is rude and distracting, both to me and to other students. I would rather you not come to class at all then to talk while I am lecturing.
4. **Everyone is to do their own work.** No cheating. If I catch

anyone cheating, those individuals will receive no leniency. None.

5. **NO FOOD AND/OR DRINK IN LAB. NOT EVER!** If you show up with food and drink in the first week, you will be asked to get rid of it. By Week 2, if you show up with food and drink, points may be deducted from your grade, at the discretion of the teaching assistant or adjunct, with direction and input and approval from Dr. Reynolds.

Honor Code Pledge: I pledge that I will neither give nor receive unauthorized aid on any test or assignment. I understand that plagiarism constitutes a serious instance of unauthorized aid. I further pledge that I exert every effort to ensure that the Honor Code is upheld by others and that I will actively support the establishment and continuance of a campus-wide climate of honor and integrity.

Course Attendance Policy: *Attendance is Required!*

Course Participation/Contribution: Class participation is crucial in laboratory.

Course Learning Evaluation: Course evaluations are an important part of our efforts to continuously improve the learning experience at UTC. Toward the end of the semester, you will receive a link to evaluations and are expected to complete them. We value your feedback and appreciate you taking time to complete the anonymous evaluations. Remember, you will be evaluating your actual instructor and NOT Dr. Reynolds (who again serves as the Course Coordinator).

Course Calendar/Schedule:

August 21, 22, 23	Syllabus/Safety Contract Sign and Turn in Laboratory Safety Contract/Laboratory Waiver Watch the following video: https://www.youtube.com/watch?v=Xod7LLHBHb4 to see some flatworms in action! How would you design an experiment to test light sensitivity? – Turn in Activity Sheet – 5 pts The Scientific Method - Turn in Data Sheet

August 28, 29, 30	Intro to Environmental Science and Basic Laboratory Skills - Turn in Data Sheet – 5 pts https://www.youtube.com/watch?v=PrOPITyZPaU When it comes to environmental science and environmental problems, think population growth, resource depletion, and rising pollution ... https://www.youtube.com/watch?v=5DzybtC0Brk This is one skill you will be practicing today!
September 4, 5, 6	No ESC Labs This Week (due to Labor Day)
September 11, 12, 13	The Microscope Watch the following video: https://www.youtube.com/watch?v=FMefm1thqiY Turn in Data Sheet - 5 pts
September 18, 19, 20	The Library Turn in Data Sheet – 5 pts Quiz 1 – 20 pts
September 25, 26, 27	Human Population Growth and Survivorship - OUTDOOR ACTIVITY Watch the following video: https://www.youtube.com/watch?v=E8dkWQVFAoA Turn in Data Sheet - 5 pts
October 2, 3, 4	MIDTERM EXAMINATION – 50 Points
October 9, 10, 11	Energy Conservation, Air Pollution, and Kilowatt Ours Turn in Kilowatt Ours Data Sheet – WATCH FROM A HISTORICAL STANDPOINT; slightly dated but still important! Energy Resources: Turn in Energy Resources Data Sheet A total of 5 points will be awarded for turning in (and correctly filling out) both data sheets.

October 16, 17, 18	No ESC Labs, Week of FALL BREAK Read and Study Soil Analysis Parts 1 and 2 (pp. 75-77, 81-83). Watch the following video as well. You will be responsible for this material on the Final Exam!
October 23, 24, 25	Soil Analysis Part of Part 1 – analyze pH of Soil A and pH of Soil B ONLY (turn in page 97) and then answer Question 1 on page 104 (turn in page 104 as well). – 5 pts https://www.youtube.com/watch?v=mg7XSicnZOM Biodiversity and the Biodiversity Crisis – Bird Walk/OUTDOOR ACTIVITY Turn in Data Sheet - 5 pts Watch the following: https://www.youtube.com/watch?v=S53qgZBxHGY
Oct. 30, 31, Nov 1	Biodiversity/Biodiversity Crisis Watch the following in class ... https://www.youtube.com/watch?v=vmC4DiT68a8 Bring your laptops if you have one. If you don't have one, get with a classmate ... Choose one threatened or endangered animal in the United States to discuss. This means the animal must be listed on the Endangered Species Act. Discuss the following in an approximately 200-250-word paragraph: • The natural habitat and where it lives (geographic range) • How it became endangered • Its current status • Actions taken to protect the species • PROVIDE TWO CITATIONS in APA Style! Turn this in at the following week's lab for 5 points.

November 6, 7, 8	Fecal Coliform Dissolved Oxygen Turn in Dissolved Oxygen Data Sheet - 5 pts https://www.youtube.com/watch?v=3os3odC_UFU Watch the following: https://www.youtube.com/watch?v=35PZbUzJp1M and if you feel motivated, examine the study referenced in the video on your own ... Quiz 2 – 20 pts Please note that because of new Biosafety Requirements, the probable number of coliform lab will be a dry lab and WILL NOT use any biological material or environmental samples.
November 13, 14, 15	Storm Water Runoff – OUTDOOR ACTIVITY Turn in Storm Water Runoff Data Sheet Turn in Fecal Coliform Data Sheet from Previous Lab A total of 5 points will be awarded for turning in (and correctly filling out) both data sheets. Watch the following: https://www.youtube.com/watch?v=kyH02NjyfPA Read and Study Solid Waste and complete Page 122 (to be turned in at Final Exam) – 5 pts https://www.youtube.com/watch?v=tl-68EVZX_k
November 20, 21, 22	NO CLASS (Due to Thanksgiving Break)
November 27, 28, 29	FINAL EXAMINATION – 50 Points

ADVISEMENT/ACADEMIC SUPPORT SERVICES RESOURCES FOR STUDENTS/KEY RESOURCES AND LINKS

- Center for Advisement and Student Success: <http://www.utc.edu/center-advisement-student-success/>
- Tutoring: <http://www.utc.edu/center-advisement-student->

<http://www.utc.edu/college-business/resources/tutoring.php> and <http://www.utc.edu/college-business/resources/tutoring.php>

- Supplemental Instruction: <http://www.utc.edu/center-advisement-student-success/academic-success/si-groupstudy.php>
- Academic Calendar: <http://www.utc.edu/records/calendars-and-schedules/index.php>
- Final Exam Schedule: <http://www.utc.edu/records/calendars-and-schedules/index.php#FS>
- Undergraduate Catalog: <http://www.utc.edu/records/course-catalogs.php>
- Records/Registrar: <http://www.utc.edu/records/>
- UTC Bookstore: <http://www.utc.edu/auxiliary-services/bookstore.php>
- UTC Library: <http://www.utc.edu/library/>

HOLIDAYS: September 4 (Monday) – Labor Day (no class)
October 16-17 (Monday-Tuesday) -
Fall Break (no class) November 22-26
(Wednesday-Sunday) – Thanksgiving
(no class)

Professor: Dr. Sean Richards
COURSE NAME: Introduction to
Environmental Science I
Semester/year: Fall Semester,
2023
Section: 2
Course: 1500/42558
CRN: 40493
Class Schedule: 1:40
pm, Tuesday and Thursday
Class Location: Holt
229
Credit: 4 h
Office
Location: 319 Holt Hall Office Phone: 423-425-4324
Office Hours: M 10am-12pm, T/Th 10am-
11pm or by appointment E-mail: sean-
richards@utc.edu

Required Texts: 1) Environment, 10th Edition. David M. Hassenzahl,
Mary Catherine Hager, Nancy Y. Gift, Linda R. Berg, Peter H.
Raven. ISBN: 978-1-119-39341-2

Course Objective: To increase your knowledge and science of
environmental events affecting mankind's health and economy.

This course fulfills a general education requirement in the Natural Sciences category.

EXPECTATIONS:

I expect you to respect your classmates by:

- 1) Arriving for lecture on time
- 2) Turning off the ringer on mobile phones
- 3) Not talking during lecture

GRADING:

Your grades will be calculated based on your performance in the following categories:

Exams	250 possible points
(Four semester tests are 45 points each. The final is 70 points.)	
Laboratory	100 possible points
Quizzes	50 possible points

Total

400 total possible points

Total points needed per grade:

A = ≥ 360 ; B = 359-320; C = 319-280; D = 279-240; F = < 240

PLEASE NOTE, YOU WILL BE EXPECTED TO TAKE ALL QUIZZES AND EXAMS VIA CANVAS. THIS MAY BE DONE VIA PHONE, LAPTOP, OR OTHER COMPATIBLE DEVICE.

Topics^s to be covered in this order:

Chapter 1: Introducing Environmental Science
and Sustainability Chapter 20: Global Climate
Change
Chapter 19: Air Pollution
Chapter 13: Water: A
Limited Resource
Chapter 21: Water
Pollution
Chapter 3: Ecosystems and Energy
Chapter 4: Ecosystems and
the Physical Environment
Chapter 5: Ecosystems and
Living Organisms Chapter
11: Fossil Fuels
Chapter 12: Renewable Energy and Nuclear Power

^sThis is a tentative schedule and subject to change. IT IS THE RESPONSIBILITY OF THE STUDENT TO KEEP INFORMED OF CHANGES, NEW MATERIALS, AND MISSED CONTENT.

Important Dates (I will not remind you of exam dates):

9/19: Exam I

10/12: Exam II

11/7: Exam III

11/30: Exam IV

12/7: FINAL COMPREHENSIVE EXAM, Thursday, December 7: 1-3 pm

(note that this time is different than lecture. You will not be allowed to take the exam if you arrive more than 15 minutes late)

ISSUES OF WHICH YOU SHOULD BE AWARE:

- Exams must be taken in class – or the DRC with approval. All exams will be given on Canvas.
- You must physically sign in for each exam in the lecture classroom.
- Make up exams are highly unlikely. In the event that you convince me to give some type of compensation, the exam will NOT be the same as given to the rest of the class. In other words, it is NOT in your best interest to miss an exam.
- If you will be missing exam due to a school-related activity, it is the student's responsibility to contact me prior to the test or assignment. You will be allowed to take the test early, but you will NOT be allowed to take tests late.
- Most material for the exams will be available in the suggested text; however, approximately 20-30% of the material will come from other sources and will only be available through course lecture and/or supplementary text. In other words, attendance is not required; however, it is NOT in your best interest to miss a lecture.
- At the beginning of each class you will have a closed-book, closed-notes, no-phone, open-brain quiz. The quiz will begin at the beginning of class (SHARP!). All quizzes will be given on Canvas. You must take the quiz in class – or the DRC with permission. You must be seated to take the quiz. The quiz will come from the previous lecture. Quizzes will account for 12.5% of your test grade – one letter grade! I will give *at least* 12 quizzes, but only count 10; therefore, you will not be allowed to make up a quiz, REGARDLESS of the reason.
- Students who violate the Honor Code of the University (a.k.a. cheat or plagiarize) in either lecture or laboratory courses for ESC 1500 (Dr. Richards) WILL receive an "F" for the course and will be subject to additional punishment according to the rules and regulations of UTC for misconduct.

OPPORTUNITIES FOR BONUS POINTS:

At the beginning of each class period, I will give one person a chance to bring up a current issue, concern, or topic about the environment as it relates to the current chapter. This can be something that you heard about on the news, something that irritates you (e.g. abusers of the environment and/or environmentalists), or something that you are curious about. There is not just one correct topic here. Basically, if you initiate and LEAD a discussion (**with 3-4 PowerPoint slides emailed to me in advance**) about the environment, you will be eligible to receive up to 10 bonus points.

Be aware, if you bring up an issue, I expect you to be fully engaged in the discussion. I will ask you questions regarding the topic. Your knowledge of the topic will factor in to the amount of bonus points you will receive. You will only receive credit for this once. Possible websites for Topic of the Day: **NOT Wikipedia!**

www.scientificamerican.com, www.ucsusa.org, www.cnn.com, www.enn.com, www.foxnews.com/science, www.nationalgeographic.com, news.discovery.com/earth, [sigmaxi smartbrief](http://sigmaxi.smartbrief). Topics must be related to environmental pollution, politics, systems, problems or solutions. Topics must be pre-approved by me (send me an e'mail with the link). Specific dates will be pre-assigned to presenters.

In order to secure a spot for 10 bonus points, you must email me with the news article and receive approval in order to present. You must also take a picture of the board which will contain notes (written by me) describing your article.

One component of a sustainable community is active, helpful participation by the citizens. In an effort to encourage community service, you may receive 5 bonus points by donating blood or 10 bonus points for donating platelets at **Blood Assurance** on 4th Street (Blood Assurance, <http://www.bloodassurance.org/>). If you cannot donate blood or platelets, you can still do the News of the Day instead. These points will be added to the total number of test points that you accumulate. In order to receive the bonus points. You may not receive credit for blood that you donated for credit in another course (e.g., Psychology 101). You must provide me with a sheet from **Blood Assurance** indicating that you gave blood or platelets (they give all patients a form with their name, blood pressure, and pulse). Make sure the technician at **Blood Assurance** indicates whether you gave blood or plasma.

You will receive a maximum of 10 bonus points for volunteering, blood, plasma, and/or News of the Day. A maximum of 10 points per person per semester.

ALL PROOF OF BLOOD OR PLASMA DONATIONS ARE DUE
ON THE LAST DAY OF LECTURE.

YOU MAY NOT PAY SOMEONE TO GIVE BLOOD OR PLASMA FOR YOU.
ALL bonus points will be added to the total number of points that you accumulate.

Communicate effectively!

When corresponding with me (or anyone else), it is a great benefit to do so in a correct and effective manner. The following is an example of an actual e'mail that I received. This example should NOT be followed.

“hey how are you i was wondering if you had an open spot for a visit tomorrow morning because i wanted to talk to you about the formate of the essay question beacuse i am not a good writer at all and the essay question is the

one thing that i have problems with the most and i was wondering if i could talk to you about a news topic for class if you do have any spots open could you let me know thanks”

Take pride in the way you present yourself!

“What do I study for the exam?”

Students should diligently take notes during lecture. Any and all notes should then be referenced back with your text. In other words, when I cover a topic in class, go to the index of the book, find the topic and study EVERYTHING that you can find in the text regarding that topic.

Policy Statements:

CAMPUS SYLLABUS

This **Campus Syllabus** is designed to provide you with important information related to all UTC classes. Please familiarize yourself with this document and the practices, policies, and procedures it references. At UTC, we are committed to providing you with a high-quality learning experience. We wish you a successful and productive semester and academic year.

Dr. Jerold L. Hale, Provost and Senior Vice Chancellor for Academic Affairs

Dr. Yancy Freeman, Vice Chancellor for Enrollment Management and Student Affairs

PERSONAL RESPONSIBILITY, ACADEMIC INTEGRITY, AND STUDENT CONDUCT

A Campus Reset and Personal Responsibility: The campus environment changed significantly in Spring 2020 as UTC moved from predominantly face-to-face instruction to all online instruction as a result of a global pandemic. Our response to the pandemic changed as circumstances related to it changed. Some campus policies were modified or suspended, public

health protocols were put into place and underwent modifications, and professors responded with flexibility to help students navigate public health challenges. The current environment does not pose as significant a public health risk as in the previous several semesters, but we are continuing to follow updated and available best practices as UTC moves forward and begins a new academic year.

We want you to be successful at UTC, and a variety of resources are available to help you succeed. Our outstanding faculty members will teach you. Our committed academic and healthcare staff will support you. Many dedicated employees from every division of campus will help to create a positive experience for you. However, if you are an undergraduate student your academic experience at UTC will be very different than your high school or even the UTC experience since Spring 2020. If you are a graduate student your UTC experience will be very different than your undergraduate experience or even your graduate school experience since Spring 2020.

It is important that we begin the new academic year with a set of common understandings.

- Subject to University policy, individual instructors have considerable autonomy over their classes and course syllabi. That autonomy includes, but is not limited to, decisions related to course content and the format, number and weightings of examinations, assignments, and other evaluative tools.
- Many deadlines, including ones for submitting assignments or completing exams or quizzes will be hard deadlines and not flexible ones. Take care to keep track of exam dates and assignment due dates for your classes.
- Many courses will have attendance policies. There are several reasons an instructor may have a course attendance policy. The learning environment may be enhanced by students interacting with one another or the instructor in a class. In some classes, course material may build upon content from previous class sessions, so an absence may put you at a disadvantage in catching up or successfully completing a course. Departments or instructors may also conclude that chronic absenteeism means that you should not be entitled to receive credit in a course. Faculty members can and will set attendance policies as described above.
- Your academic success at UTC will depend, in part, on things other than your academic aptitude. Your success will be determined further by the choices you make about your time, including class attendance, participation, study habits, and even management of time outside of class. Importantly, you are responsible for the consequences of the choices you make.
- A college experience is more than just classes. Explore extracurricular and co-curricular activities to meet students with whom you share similar interests. You are more likely to have a positive and successful experience at UTC if you actively engaged in campus life.

- There are hundreds of course options at UTC. Explore interesting courses outside your major. There is nothing wrong with enrolling in a class because it sounds fun or interesting. If you are concerned about progress to graduation, an academic advisor can help you choose classes that keep you excited about school and get you ever closer to a degree.

Student Code of Conduct, Honor Code, and Honor Code Pledge:

Student Code of Conduct: The University has established the Student Code of Conduct to maintain a safe learning environment, protect the rights and privileges of members of the University community, provide for orderly conduct of operations, promote a positive relationship between the University and the community, and preserve institutional integrity and property. All UTC students are encouraged to engage in conduct that brings credit to themselves and the University and that ensures graduates are ready to contribute to society as ethical and engaged citizens. You should familiarize yourself with the Student Code of Conduct.

Honor Code: The University has established an Honor Code to foster and maintain a climate of honesty and integrity. The Honor Code gives you and other students primary responsibility for upholding its standards of conduct and is predicated upon the principle that every student should and must recognize and respect the fundamental importance of honesty. You are responsible for conducting yourself in accordance with the rules and regulations of the Honor Code. You are also expected to ensure that others uphold the standards.

The Honor Code applies to all students and all courses. It prohibits any act of academic dishonesty, including without limitation: (1) Cheating; (2) Plagiarism; (3) Falsification, Fabrication, or Misrepresentation; (4) Use of Unauthorized Materials; (5) Use of Unauthorized Assistance; (6) Gaining Unfair Advantage; (7) Causing Unfair Disadvantage; and (8) Attempting or Assisting a Violation. You should review the [UTC Honor Code](#).

Honor Code Pledge: You will be expected to uphold the Honor Code and to ensure that it is upheld by others. Those expectations are communicated succinctly in the [Honor Code Pledge](#).

Other Academic Integrity Resources: The Canvas learning management system (also called UTC Learn) includes a plagiarism detection tool used by many instructors. Ask your instructors to make the detection tool available so that you may check your written work before submitting it, so you can correct any unintended violations.

Some instructors utilize electronic proctoring of online exams and other records of activity to monitor for integrity violations. Ask your instructor whether electronic monitoring will be used in your online course(s).

ACADEMIC SUPPORT RESOURCES

Library: The UTC Library provides you access to books, movies, articles, and more, both online and physically. It also offers academic supports (*e.g.*, reservable study spaces,

equipment checkout, a studio for creative projects, a writing center, and on-site computers, printers, and copiers) to assist students with course assignments.

Writing and Communication Center (WCC): For a [guaranteed consultation](#), you may make an appointment by visiting the front desk, calling 423-425-1774, or making an [appointment online](#).

Studio: The UTC Library Studio (3rd Floor) is a workspace for innovative technology and media creation. It includes 16 workstations loaded with specialized software to assist with creative projects. The Studio also has talented faculty and staff to help you get started regardless of your experience level.

Students with Disabilities, Illnesses, or Injuries: UTC is committed to providing an accessible learning environment. If you anticipate or experience a barrier in a course due to a permanent or temporary physical or mental health-related disability, you should contact the UTC Disability Resource Center (DRC) via [email](#) or by calling 423-425-4006. A DRC staff member will discuss your needs and next steps, including communication with your instructors. ***Appropriate medical documentation will be required and should be provided to the DRC staff and not to your instructors.*** The DRC will engage in an interactive process with you and your instructors to help find reasonable accommodations that will assist with mitigating or overcoming disability-related barriers.

Please note that common temporary illnesses (e.g., cold, flu, strep throat, etc.), in most instances, do not qualify as disabilities that require accommodations under the law. You should consult with your instructors regarding their class attendance and excused absence policies.

Course Modality: The [Course Schedule](#) lists the modality in which a course, or section of a course, is being offered (e.g., in-person, online, or hybrid). Subject to University policy, the course modalities listed in the Course Schedule for your courses will not be altered or modified.

Accessibility to Courses and Course Materials <http://www.utc.edu/drc> UTC will make course materials (e.g., handouts and readings) accessible when reasonably possible.

Tutoring and Advising: [Center for Academic Support and Advising \(CASA\)](#) advises freshmen and students who have not declared a major. CASA also supports all students through several tutoring and peer-mentoring programs. Contact [CASA](#) at 423-425-4583 or simply come to UTC Library, Room 335 for assistance.

Technology: If you have problems with your UTC email account or with UTC Learn (the Canvas learning management system), contact IT Help Desk at 423-425-4000, [email](#), or [submit a ticket](#). If you have technology needs to access your courses and/or complete course

requirements in Canvas, [submit a request](#) with Information Technology.

UTC Email and Communication: To enhance student services, UTC uses UTC email addresses for all communications. You must know how to use your UTC email and should check it daily for timely receipt of class announcements and other important information. If you have difficulties accessing your account or UTC Learn, contact the Solutions Center at 423-425-4000.

UTC Bookstore: The UTC Bookstore will [price match](#) Amazon, bn.com, and local competitors for the exact textbook—same edition, format, and rental term.

Course Learning Evaluations and Assessment: Faculty members, students, and administrators have a collective responsibility to continuously improve teaching, learning, and course design. You may be asked to assess qualities of learning in your courses during or at the end of the term. The constructive feedback you provide through our anonymous course assessments helps us provide the highest quality education possible.

STUDENT HEALTH AND WELLNESS

University Health Services (UHS): [UHS](#) provides health care to UTC students, faculty, and staff. Services include treatment for acute and chronic illnesses, physical exams, screenings, immunizations, lab services, TB skin testing, and allergy shots.

UTC Counseling Center (UTCCC): [UTCCC](#) promotes campus health and wellness through brief, solution-focused therapeutic interventions aimed at enhancing mental health, interpersonal relationships, and student success. It offers counseling for issues including, but not limited to, depression, anxiety, adjustment issues, relationship problems, crisis intervention, and trauma. The Counseling Center offers both in-person and telehealth appointments.

Please contact 423-425-4438, [email](#), or visit the Counseling Center in the 338 University Center to schedule an appointment with a counselor. Crisis services are available 24/7. Please contact 423-425- CARE (2273) if you are experiencing a mental health crisis. For emergencies after hours, contact 423- 425-CARE (2273) or call 911.

Aquatic and Campus Recreation Center (ARC): The ARC is an inclusive community environment in which to connect, play and pursue holistic well-being. Facilities and activities include group fitness studios, spin room, climbing tower, exercise equipment, multi-sport courts, natatorium, indoor track, outdoor programs, club sports, and more.

[Center for Well-Being:](#) The center promotes healthier, well-balanced lifestyles. It can provide you with the tools, knowledge, and community to help you develop coping skills, recognize warning signs, practice self-care, and learn skills for helping others. Wellbeing focus areas include mental health awareness, substance use education and prevention, physical health, sexual health, and nutrition.

Office of Student Outreach and Support (SOS): The [Office of Student Outreach & Support](#) advocates and supports students experiencing challenges in their personal and academic

lives. SOS staff can help you navigate University administrative processes; connect with University and community resources; and develop resiliency, self-advocacy, and coping skills. Referrals can be made by students, faculty, staff, or individuals outside of the UTC community. To make a referral, you should submit a [Community Member of Concern Form](#). For support or assistance, call (423) 425- 2299 or [email](#).

Scrappy's Cupboard: If you are experiencing food, financial, housing, or other insecurity, including difficulty affording meals, groceries, hygiene products, or clothing, you can access [Scrappy's Cupboard](#) for support. Scrappy's Cupboard is anonymous and free. For assistance, [email](#) or call the Office of Student Outreach and Support at (423) 425-2299.

Student Emergency Fund: [The Denise and Tim Downey Student Emergency Fund](#) provides students with limited emergency funding. If you are experiencing financial hardship due to an accident, emergency, illness, or other unforeseen event, and are enrolled full- or part-time, you are eligible for emergency assistance. Funds may be used for (1) essential academic supplies; (2) replacement of items lost due to fire, theft, or flood; (3) short-term housing needs; (4) one-time or non- recurring medical expenses; and (5) emergency expenses related to dependents. For assistance, [email](#) or call the Office of Student Outreach and Support at (423) 425-2299.

UTC-Alert System: UTC is committed to providing a safe environment for living, learning, and working. The campus is alerted to emergencies via the [UTC-ALERT system](#). You will receive SMS text messages at the mobile number you provided you registered at UTC. UTC-ALERT will provide important information and instructions to keep you safe during an emergency. When you receive an alert via UTC-ALERT, it is important that you follow any instructions contained in the alert. If you receive a campus closure alert due to inclement weather, your online course will proceed as normal, unless there are extensive power outages.

ADDITIONAL UNIVERSITY POLICIES AND SUPPORT RESOURCES

Student Support Resources and Privacy and Accessibility Statements: A list of [additional resources](#) available to you, and privacy and accessibility statements, are on the Walker Center for Teaching and Learning Student Resources Page:

Statement on Title IX and Mandatory Reporting: Title IX is a federal law that prohibits discrimination based on sex in educational programs and activities that receive federal funds.

Discrimination based on sex includes, but is not limited to, sexual misconduct, relationship violence, and stalking. UTC strives to prevent, address, and eliminate this type of misconduct by responding to individual incidents, supporting those who have been harmed, and educating community members on how to create a safe and supportive campus that encourages healthy and

respectful relationships.

Faculty members have a responsibility to help create a safe learning environment on our campus. To accomplish this, faculty have a [mandatory reporting obligation](#) and are required to share information with the University regarding sexual misconduct, relationship violence and/or stalking that is disclosed to them during the performance of their duties.

If you or someone you know has experienced behavior prohibited by Title IX, you may speak to someone confidentially by contacting Survivor Advocacy Services (SAS), located in the Center for Women & Gender Equity, at 423-425-5648 (M-F, 8 a.m. – 5 p.m.).

Questions regarding Title IX, complaints of non-compliance, and complaints of sexual misconduct, relationship violence and stalking may also be directed to the Title IX Coordinator at 423-425-4255 or titleix@utc.edu.

Equal Opportunity Statement, Affirmative Action Policy: In accordance with the requirements of Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act of 1990, The University of Tennessee at Chattanooga affirmatively states that it does not discriminate on the basis of race, sex, or disability in its education programs and activities. Please see the [Student Handbook](#) for the complete Affirmative Action Policy.

Religious Accommodations: If you plan to observe a holy day pertaining to your religious faith, and the observance will require you to miss class meetings and/or complete assignments, examinations, or other course requirements on the due date, you should complete the [Academic Notification process](#) prior to the date(s) in which the holy day occurs. The Office of Student Outreach & Support (SOS) will review your request and provide verification to course instructors. After SOS notification has been sent, you must contact your instructors to discuss obtaining missed materials from class meetings and/or options for completing missed coursework and other requirements. The course instructor will determine as applicable the appropriate future due dates and option(s) for completing missed coursework or other requirements.

Active-Duty Military and Military Accommodations: UTC values the contributions that active-duty members of the armed forces, veterans of military service, and members of our ROTC Corps of Cadets make to our campus and learning environment. If you are active-duty military, please visit the [Center for Military and Veteran's Affairs website](#) for more information on policies and resources related to your active duty status.

If you are serving in the U.S. Military or National Guard and are called to Active Duty, which requires you to miss one or more class meetings and/or completing assignments, examinations, or other course requirements on the due date, you should complete the [Academic Notification process](#) as soon as your orders are received. The Office of Student Outreach & Support (SOS) will review and provide verification to course instructors. Upon returning from Active Duty, you must contact your instructors to discuss obtaining missed materials from class meetings and/or options for completing missed coursework and other requirements. The course instructor will determine the appropriate future due dates and option(s) for completing missed coursework or other requirements. You also have the option to officially withdraw from courses impacted by military obligations. [Contact the Office of the Registrar](#) and/or the Office of Student Outreach & Support (SOS) for assistance to withdraw.

Pregnancy Accommodations: If you are or become pregnant and [need special accommodations because of your pregnancy](#), contact the Office of Student Outreach and Support for assistance by calling (423) 425-2299 or e-mailing sos@utc.edu.

Class Attendance, Absences and Academic Notification: Class attendance and performance are strongly and positively correlated, *i.e.*, the more regularly you attend, the better you are likely to perform. You should attend class whenever your health or personal circumstances allow. If you are unable to attend class due to an extenuating circumstance, you should complete the [Academic Notification process](#) as soon as possible. Examples of extenuating circumstances include, but are not limited to: (1) death of an individual related to the student; (2) physical or mental health concerns; and (3) military, religious, or legal obligations. The Office of Student Outreach and Support (SOS) will review the request and provide verification of need to course instructors. Requests can only be processed by SOS upon receipt of sufficient documentation. Course instructors will determine the appropriate level of leniency, if any, they are able to provide. The student should contact course instructors to discuss if leniency is possible and, if so, options for completing missed coursework or other requirements.

Other Important Resources for Students:

- [Academic Calendar](#)
- [Center for Advisement & Student Success](#)
- [Final Exam Schedule](#)
- [Records/Registrar](#)
- [UTC Bookstore](#)

Appendix 1-I

	Outcome 1: Characterize and identify common geologic materials (e.g. minerals, rocks, fossils, and soils) in field and/or laboratory settings.	Outcome 2: Describe slow, commonly imperceptible, geologic processes in the context of the enormous scale of geologic time, and the energy gradients that drive them.	Outcome 3: Apply knowledge of geology and systems thinking to critically assess problems that impact society.	Outcome 4: Use spatially, geometrically, and/or temporally related data to formulate conceptual and/or computational models to effectively interpret geologic structures, geologic processes, geologic history and/or the genesis and evolution of geologic materials and structures.	Outcome 5: Demonstrate critical thinking through the effective design and execution of geologic research.	Outcome 6: Effectively communicate geotechnical information by written, oral, and graphical means.
GEOL 1110 Physical Geology	I	I	I	I		I
GEOL 1110L Physical Geology Lab	I	I	I	I		
GEOL 1025 Geology of the National Parks	I	I,P	I	I		I,P
GEOL 1030 Natural Hazards	I	I,P	I	I		
GEOL 1040 Earth Resources and the Environment	I	I	I,P	I		
GEOL 1105L Earth and the Environment Lab	I	I	I	I		
GEOL 2200 Global Climate Change: Past, Present, and Future	I	I,P	I,P	I	I	I
GEOL 2250 Oceanography	I	I,P	I,P	I	I	I,P
GEOL 1120 Historical Geology	I	I	I	I		
GEOL 1120L Historical Geology Lab	I,P	I		I		
GEOL 2100 Introductory Geographic Information Systems and Remote Sensing			I	I,P	I	I,P
GEOL 3410 Mineralogy	P,C	I		I	I	
GEOL 3420 Petrology	P,C	P,C		P,C		P
GEOL 3540 Sedimentary Rocks and Stratigraphy	P,C	P,C	P,C	P,C		

GEOL 3430 Paleontology	P	P		P		
GEOL 4080 Earth Surface Processes		P	P	P		P
GEOL 4510 Structural Geology		C		C	P	P
GEOL 3230 Environmental Geology	I,P	I	I	I,P		P
GEOL 3220 Soil Properties, Genesis, and Development Across the Landscape	I,P	P	P	P,C	P	P
GEOL 4070 The Dynamic Earth		C		P		P
GEOL 4450 Hydrogeology			P, C	I,P	P	P
GEOL 4490 Hydrologic Modeling				C	P	P
GEOL 4470 Applied Environmental Geochemistry			P, C	P,C	P	P
GEOL 4520 Field Methods in Structural Geology	P,C	P,C		C	P,C	C
GEOL 4530 GIS for Geoscientists			P	P,C	P,C	P,C
GEOL 4550 Remote Sensing for Geoscientists			P	P,C	P,C	P,C
GEOL 4800 Research Design					C	C
GEOL 4900 Senior Research Project					C	C

I= introduce

P= practice

C= competency

Appendix 1-J

Physical Geology Laboratory Fall 2023

GEOL 1110L, CRN:40402, online, 1-credit

Instructor: Dr. Stephanie DeVries

Email: stephanie-devries@utc.edu

Zoom Room Meeting Hours: Have questions? I have answers. Email me to request a meeting in my [Zoom Room](#). I am available for meetings most weekdays 4:00–8:00 pm and Sundays 6:00–8:00 pm.

Communication Policy:

Students can reach me by Canvas Mail or UTC email. I check and respond to student emails twice a day, generally between 12:00–1:00 pm and 5:00–6:00 pm (may vary on weekends).

Instructor Statement:

It is my intent to foster a supportive and engaging online learning environment that is inclusive and accessible to students of all diverse backgrounds and perspectives. Geology is a discipline that encourages participation from all humans and does not discriminate based on gender identity, sexuality, disability, age, socioeconomic status, race, nationality, religion, or culture. If you have suggestions that you believe will create a greater sense of inclusion and engagement in this course, please share your ideas with me..

Course Catalog Description:

Introduction to geology with emphasis on the origin of Earth, geological materials (minerals, rocks), geological processes and events (mountain building, erosion, earthquakes, volcanic activity) and geological features (oceans, land forms).

Course Pre/Co Requisites:

Physical Geology (Geology 1110), or department head approval. Note: Both lecture and lab must be taken in the same semester to receive general-education credit. This sequence meets General Education requirements for Natural Science category with a lab. It cannot be taken for Gen. Ed. credit without the Physical Geology lecture (GEOL 1110).

Course Student Learning Outcomes:

Upon completion of this course, it is expected that the students will be able to:

- C1. Apply their knowledge of fundamental sciences to the study of Earth.
- C2. Make simple calculations relevant to the study of Earth.
- C3. Characterize and classify select minerals, igneous, metamorphic, and sedimentary rocks, and geologic structures.
- C4. Explain age relationships among stratigraphy and geologic structures in the context of fundamental principles.
- C5. Describe plate tectonics and its relation to geologic processes and events.

This course is certified as a General Education course fulfilling the Natural Science with a lab category. Please consult with your advisor and check the specific requirements for your major to determine if this course is a good fit for your plan of study.

Required Course Materials:

Essentials of Geology (7th Edition) by Stephen Marshak (ISBN 978-0-393-88272-8). Online study and review materials are included with textbooks purchased at the UTC Bookstore.

Lab Kit – All students are provided with a lab kit that contains the materials students will need to complete the assigned activities in this lab.

- Lab kits must be signed out (picked up) by Wednesday, August 30, 2023.
- Lab kits must be signed in (returned) by Wednesday, December 6, 2023.

Unreturned lab kits will result in a \$150 bursar hold. Missing or damaged items will be charged to student accounts.

Technology Requirements for Course:

This course will require students to have regular access to a PC or Apple computer with a webcam, microphone, and the following software:

- Microsoft Office (Word, Excel, OneNote). Microsoft Office products are free for students and can be downloaded from the university at: <http://www.utc.edu/information-technology/services/software-students.php>.
- Adobe Acrobat Reader. Available free at: <https://get.adobe.com/reader/otherversions/>.
- Google Earth Pro. Free at: <https://www.google.com/earth/versions/>
Google Earth Pro requires a Windows (7 or greater) or Mac OS operating system – this software will NOT work on Chromebook tablets.

All required technology is also available on UTC library computers. Students may also request a loaner laptop by completing a [Technology Request Form](#).

Technology Skills Required for Course:

Students must be able to:

- Use email (Canvas mail or MOCS mail).
- Access and navigate UTC Learn.
- Access Google Resources using your MOCs ID (Drive, Docs, Sheets).
- Perform simple calculations in Microsoft Excel.
- Open, explore, and create .kmz files in Google Earth Pro.
- Open, fill, sign, insert images, and save PDF documents and forms in Adobe Reader.

If you have problems with your UTC email account, access to your Google account, or with UTC Learn, contact the IT Solutions Center at 423.425.4000 or itsolutions@utc.edu

Digital Literacy Skills Required for Course:

Students are required to use technology to find information, evaluate sources, create content, and communicate with others effectively.

Technology Support: If you have problems with your UTC email account or with UTC Learn (Canvas), contact IT Help Desk at 423-425-4000 or email helpdesk@utc.edu.

Student Technology: If you have technology needs to access your courses and/or complete course requirements in Canvas, [submit a request](#) with Information Technology.

Course Assessments and Requirements:

Each lab includes a combination of 3–5 graded activities and/or quizzes worth a total of 100 points. Grades are assessed from the average total points earned out of 1100 (11 labs).

*Grading Scale

Final course letter grades will be assigned as follows:

- A = 90–100%
- B = 80–89.9%
- C = 70–79.9%
- D = 60–69.9%
- F ≤ 59.9%

*Grades are rounded to the nearest 0.1%, i.e., 89.86% will round to 89.9%, which is a B.

Lab Assignment Grades

Lab assignments will be graded on completion and assessment of specific key questions that I will not disclose. If you have questions about your grade, please contact me (see Communication policy).

Instructor Grading and Feedback Response Time:

All grades can be viewed in the Canvas Grade Book and will be posted within 1 week of assignment due dates, except in extenuating circumstances.

COURSE AND INSTITUTIONAL POLICIES

Late/Missing Work Policy:

Students are expected to submit work on or before scheduled due dates. Late assignments will be accepted at a **penalty of 5% per day. Students are allowed to make-up 1 missed/incomplete lab by the end of the term with no penalty.** If student work is chronically late or missing, the instructor may refer the student to the Office of Student Outreach and Support to discuss appropriate support and accommodations.

Student Conduct Policy: UTC's Student Code of Conduct and Honor Code (Academic Integrity Policy) can be found on the [Student Conduct Policy page](#).

Honor Code Pledge: As a student of the University of Tennessee at Chattanooga, I pledge that I will not give or receive any unauthorized assistance with academic work or engage in any academic dishonesty in order to gain an academic advantage. I will exert every effort to ensure that the Honor Code is upheld by myself and others, affirming my commitment to a campus-wide climate of honesty and integrity.

Course Attendance Policy: Students are expected to log in to the Canvas course page at least once per week.

Course Participation/Contribution: Students are expected to participate in weekly discussions and/or reflection activities as assigned. Failure to participate may affect your course grade.

Student Accommodations: If you have accessibility and accommodation requests, contact the [Disability Resource Center](#) at 423-425-4006 or email DRC@utc.edu.

Student Support Resources and Privacy and Accessibility Statements: A list of student resources and privacy and accessibility statements are available on the [WCTL Student Resources Page](#).

Course Learning Evaluation: Course evaluations are an important part of our efforts to continuously improve learning experiences at UTC. Toward the end of the semester, you will be emailed links to course evaluations, and you are expected to complete them. We value your feedback and appreciate you taking time to complete the anonymous evaluations.

UTC Bookstore: The UTC Bookstore will price match Amazon and [Barnes and Noble](#) prices of the exact textbook (same edition, ISBN, and format, with the same rental term). For more information, go to the [Bookstore Price Match Program](#), visit the bookstore in the University Center, email sm430@bncollege.com, or call 423-425-2184.

COURSE SCHEDULE

Changes to Syllabus and Schedule: The following schedule is tentative; adjustments to the schedule of topics, exam dates, and reading assignments may be made in accordance with the rate of progress in the classroom and to accommodate University closings.

Lab	Topic	Due Date
	Getting Started	Thursday, August 24, 2023
Lab 1	The Scientific Method	Thursday, August 31, 2023
Lab 2	Exploring Earth's Interior	Thursday, September 7, 2023
Lab 3	Plate Tectonics	Thursday, September 14, 2023
Lab 4	Topographic Maps and Profiles	Thursday, September 21, 2023
Lab 5	Minerals	Thursday, October 5, 2023
Lab 6	Igneous Rocks	Thursday, October 19, 2023
Lab 7	Sedimentary Rocks	Thursday, October 26, 2023
Lab 8	Metamorphic Rocks	Thursday, November 2, 2023
Lab 9	Earthquakes	Thursday, November 9, 2023
Lab 10	Geologic Structures	Thursday, November 16, 2023
Lab 11	Geologic Time	Thursday, November 30, 2023

Historical Geology Fall 2023

GEOL 1120, CRN 40544, Face-to-Face, 3 credit hours

Instructor: Prof. Jeremy L. Bramblett

Email and Phone Number: Jeremy-Bramblett@utc.edu (423) 425-5788

Office Hours and Location: M 1:00-2:00PM, R 9:00-10:00AM, 1:00-3:00PM, Other times by Appointment including virtually via Zoom; Grote 101

Course Meeting Days, Times, and Location: MWF 10:00-10:50PM; Fletcher 125

Course Catalog Description: Geologic history of Earth, with emphasis on geologic time and the evolution of life as gleaned from the fossil record. Field trips.

Course Pre/Co Requisites: GEOL 1120L or department head approval.

Course Student Learning Outcomes: 1) Students will identify select minerals, rocks, fossils, and sedimentary structures and provide reasonable justifications for identifications based on direct observations. 2) Students will demonstrate an understanding of the concept of geologic time and associate that understanding with major geologic events and major events in the history of life on Earth. 3) Students will interpret geologic structures and relationships among rock units using published geologic maps. **Program Student Learning Outcomes:** 1) Characterize and identify common geologic materials (e.g., minerals, rocks, fossils, and soils) in field and/or laboratory settings. 2) Describe slow, commonly imperceptible, geologic processes in the context of the enormous scale of geologic time, and the energy gradients that drive them. 4) Use spatially, geometrically, and/or temporally related data to formulate conceptual and/or computational models to effectively interpret geologic structures, geologic processes, geologic history and/or the genesis and evolution of geologic materials and structures.

General Education Student Learning Outcomes: Historical Geology lecture (GEOL1120) and lab (GEOL 1120L) must both be taken in order to receive General Education credit the Natural Sciences Category (The purpose of this category is to allow students to participate in the systematic ways in which human beings analyze the physical universe, to appreciate the achievements of the human mind in comprehending the universe, and to understand the significant role of the natural sciences in human development). Grades are calculated and reported separately for lecture and lab.

1) Students will explain how scientific knowledge develops over time as new evidence emerges. 2) Students will demonstrate scientific literacy by locating, evaluating, interpreting, and applying scientific information/data. 3) Students will explain how scientific developments impact society.

Course Fees: Laboratory/studio course fee will be assessed for course co requisite (GEOL 1120L) \$50.00.

Required Course Materials: Stanley and Luczaj 2015. *Earth System History* (4th Edition), W. H. Freeman and Company, ISBN 13-978-1-4292-5526-4.

Technology Requirements for Course: You need access to a computer with a reliable internet connection. Test your computer set up and browser for compatibility with UTC Learn at <http://www.utc.edu/learn/getting-help/system-requirement.php>. You will also need access to a smartphone or digital camera and a printer.

Technology/Digital Literacy Skills Required for Course: These include using Microsoft Word, Excel, and PowerPoint, using the learning management system (UTC Learn), using MOCSNet email, creating and submitting files (e.g., PDFs) to UTC Learn, and web applications (e.g., <https://www.sketchfab.com/>, <https://geology.com/>, etc.).

Course Assessments and Requirements: The course letter grade will be comprised of the following: quizzes (15%), homework and projects, (15%), cumulative exams (50%), cumulative final exam (20%).

Course Grading

Course Grading Policy: Course letter grades: A = 90%+, B = 80-89.9%, C = 70-79.9%, D = 60-69.9%, and F < 60%.

Instructor Grading and Feedback Response Time: I will strive to post grades within two weeks of the due dates.

Course Policies

Late/Missing Work Policy: Late work will be deducted 25% for each day submitted past the due date. Therefore, work submitted after 3 days past the due date will be considered missing and will receive a score of 0%.

Course Attendance Policy: You are expected to attend all class meetings and take all quizzes and exams during class meetings.

Course Participation/Contribution: You are expected to attend and participate in all class meetings; take all quizzes and exams during class meetings; complete all assignments by the due dates posted on UTC Learn (Canvas).

Academic Integrity: As a student of the University of Tennessee at Chattanooga (“UTC” or “University”), you are expected to abide by the University’s [Honor Code](#). Any suspected violation of the UTC Honor Code will result in a referral to the Office of Student Conduct and may result in a grade of F (0) on an assignment, examination, or course should you be found responsible for the alleged violation.

Generative Artificial Intelligence (AI) - Limited Use Permitted: All submitted coursework must be your own original work. Inclusion of proper citations, using the

accepted citation style for this course, is required per the UTC Honor Code. While the use and/or inclusion of any materials derived by a Generative AI tool is generally prohibited, you may be given written permission to use such a tool for one or more assignments. Any coursework which uses Generative AI will include explicit directions on when and how to use such tools, as well as how to properly cite the resource. Failure to follow any of the aforementioned guidelines constitutes a violation of the Honor Code and will result in a referral to the Office of Student Conduct.

Course Calendar/Schedule: This course calendar/schedule is tentative and subject to revision. Please consult UTC Learn (Canvas) for all assignment and assessment due dates.

Course Calendar/Schedule: This course calendar/schedule is tentative and subject to revision. Please consult UTC Learn (Canvas) for all assignment and assessment due dates.

Stanley & Luczaj (2015)	Topics & Exams	Dates
	Pretest	Friday (25 Aug 2023)
Chpt. 1	Earth System	
Chpt. 2	Minerals & Rocks	
Chpt. 3	Diversity of Life	
Chpt. 4	Environments & Life	
Chpt. 5	Sedimentary Environments	
	Exam I (Chpts. 1-5)	Wednesday (13 Sept 2023)
Chpt. 6	Correlation & Dating	
Chpt. 7	Evolution & Fossil Record	
Chpt. 8	Plate Tectonics	
Chpt. 9	Continental Tectonics & Mountains	
Chpt. 10	Geochemical Cycles	
	Exam II (Chpts. 1-10)	Wednesday (11 Oct 2023)
Chpt. 11	Hadean & Archaean	
Chpt. 12	Proterozoic	
Chpt. 13	Early Paleozoic	
Chpt. 14	Middle Paleozoic	
Chpt. 15	Late Paleozoic	
	Exam III (Chpts. 1-15)	Wednesday (15 Nov 2023)
Chpt. 16	Early Mesozoic	
Chpt. 17	Cretaceous	

Chpt. 18

Paleogene

Chpt. 19

Late Cenozoic

Chpt. 20

Holocene

Prefinal Exam

Monday (4 Dec 2023)

Final Exam (8:00-10:00AM)

Friday (8 Dec 2023)

University of Tennessee at Chattanooga FALL 2023

**GEOL 3410: MINERALOGY LECTURE AND LAB (4 credit hours)
CRN 40410**

Instructor: **Face-to-Face Classroom Instruction, Experiential Learning
Designated Department of Biology, Geology, and
Environmental Science**

Amy L. Brock-
Hon Ph.D.
Office: 218-B
Grote Hall
Phone:
423.425.440
9

Email: amy-brock-hon@utc.edu

Office Hours:

Monday and Wednesday 10:00-11:00am, and by appointment in my office. On Mondays from 3-5 I am also available in the Earth Center in Grote 210. Students may also contact me through email or by phone. I will do my best to respond by email within 24 hours.

Lecture Days/Time and Location:

MWF 9:00-9:50 in
Grote 210

**Laboratory
Day/Times and
Location:**

Monday 1:00-2:50pm in Grote 210

Course Description:

Crystallography, descriptive and determinative mineralogy, mineral chemistry, and methods of chemical analysis. Upon successful completion of this course, students will be able to characterize and identify common minerals in hand specimen, recognize the importance of chemical composition, bonding, and atomic structure on mineral properties, interpret and articulate the genesis of common minerals, apply critical thinking and problem-solving skills to evaluation of mineral data, and explain the importance of minerals to society.

Note: This course is intended to be the undergraduate student's first course in mineralogy. It expands greatly upon the treatment of the subject given in GEOL 1110 and serves as preparation for many upper-level geology courses.

Prerequisites:

A previous 3-4 credit hour course in Geology, or department head approval.

Pre- or Corequisites:

CHEM 1110/1110L, or department head approval.

Fees: Lab fee \$50

Course Student Learning Outcomes:

Upon completion of this course, it is expected that students will be able to:

- 1) Characterize and identify common minerals in hand specimens, using commonly available tools and aids to observation,
- 2) Recognize the importance of chemical composition, bonding, and atomic structure on mineral properties,
- 3) Interpret and articulate the genesis of common minerals,
- 4) Apply critical thinking and problem-solving skills to evaluation of mineral data,
- 5) Build teamwork and organization skills by solving problems collaboratively,
- 6) Explain the importance of mineralogy to society,
- 7) Practice written and oral communication skills to express value in the study of minerals and relate how the study of minerals applies to the student's own academic and professional goals.

Required Materials:

We will use a free, online Mineralogy textbook found here:
<https://opengeology.org/Mineralogy/> A basic calculator (not on phone).

~100 3x5 notecards.

Supplemental Materials:

Additional readings and videos will be posted to UTC Learn for the course.

Computer and Software Requirements:

Several activities conducted outside of the classroom may require you to have access to a computer with Adobe Reader, Microsoft Word, and Excel. Microsoft Word and Excel are free for students and can be downloaded from the university at: <http://www.utc.edu/information-technology/services/software-students.php>. Adobe Reader is available for download for free from: <https://get.adobe.com/reader/otherversions/>. If you need technology to access your courses and/or complete course

requirements in Canvas, submit a request (<https://new.utc.edu/information-technology/learning-from-home>) with Information Technology. **Note: All of these are available to you for free on the library computers.**

Required Technology Skills and Support:

Skills required to successfully complete this course include being able to access and use your UTC email including Google Drive and Google Sites, access and navigate UTC Learn, search the web for information, use Microsoft Word and basic Excel, and open .pdf documents. **You must be able to access UTC Learn by the end of the first week of classes.** If you have problems with your UTC email account or with UTC Learn (Canvas), contact the IT Help Desk at 423.425.4000 or helpdesk@utc.edu.

Communication:

To enhance student services, the University uses your UTC email address for all communications. Check your UTC email at least once a day. Students are expected to communicate in a clear and professional manner. Because this is a place of learning and to prepare you for your future professional endeavors, if I consider communication from a student to be unprofessional, I will request that the communication to me be re-submitted.

COURSE GRADING

The final numerical grade for the course will be computed as follows. Each type of grade opportunity is worth a certain portion of your grade. ***The UTC Learn gradebook will only be used to post grades. The grade total column will not be used and you will need to calculate your grade yourself.*** You can easily do this by inserting the grades earned into the formula below and totaling the resulting values from the column on the right. You can do this at any point in the semester to see your current grade and predict what you need to make to earn a certain score in the course.

Exam 1 (15%)	_____ x 0.15 = _____
Exam 2 (15%)	_____ x 0.15 = _____
Exam 3 (15%)	_____ x 0.15 = _____
Lab Practical Exam (10%)	_____ x 0.10 = _____
Avg. Thoughts on Readings (5%)	_____ x 0.05 = _____
Avg. Activities (in-class and take-home) (15%)	_____ x 0.15 = _____
Mineral Challenge (5%)	_____ x 0.05 = _____
Mineral ID cards (3%)	

Avg. of 4 Mineral quizzes (2%)	
Project (10%)	_____ x 0.10 = _____
Avg. 3 reflections (3%)	
Final Presentation (7%)	
ePortfolio (10%)	_____ x 0.10 = _____

The final letter grade for this class will conform to the following scale, based upon the computed final numerical grade.

A = 90-100

B = 89.9-80

C = 79.9-70

D = 69.9-60

F = ≤59.9

IMPORTANT: *You must earn a letter grade in this course of C or better to enroll in Petrology in the following Spring Semester.*

Late homework and activity deductions:

All work is expected to be completed and submitted on or before (preferred) the due date and time. If late work is submitted, for any reason, it must be emailed to me or submitted to me in my office (per the submittal instructions) and the following will apply. This does not apply to exams and in-class activities completed on the same day or Thoughts on Readings.

Submitted within 12 hours past original due date and time: Maximum grade possible: 90%
 Submitted within 24 hours past original due date and time: Maximum grade possible: 80%
 Submitted within 36 hours past original due date and time: Maximum grade possible: 70%
 Submitted 36 hours or more past original due date and time: Receive zero for activity, homework, et

POLICIES

Instructor feedback and grading response time:

Students can expect to receive a grade for their submitted work within 1 week of submittal. In some instances, (during conference travel, or when homework activities are more grading-intensive) it may take longer than a week. All grades will be posted on UTC Learn.

Missed quizzes, exams, and in-class activities:

If you miss an in-class activity, quiz, or exam that was completed in class or lab, you will receive a zero for that grade opportunity. Make-up of a grade opportunity will be **considered** only if you notify the instructor as soon as possible to discuss the absence and make-up possibilities. You must also contact the Office of Student Support (see Campus Syllabus) and provide any necessary documentation to support your absence. If they deem your absence reasonable, they will contact me. I will then consider all this information before deciding on make-up of missed grade opportunities.

Attendance Policy and Course Participation:

Students are expected to attend class regularly and to participate in class discussions. Attendance and participation may be considered in the final grade. It is important that you attend class because we cover a lot of material, and I will provide guidance for reading assignments and exam questions. You are responsible for all material covered in lectures and labs no matter what causes your absence. If you miss a lecture, get the notes from a classmate, review the notes, and see the instructor with questions. If you miss a class when a take-home activity/homework is handed out, it is your responsibility to get a copy from the instructor prior to the completion deadline for the activity. If you miss homework, lab, quiz or exam, no matter what the reason, you must abide by the policy on late/missed work and exams.

It is expected that all students will demonstrate involvement in the course by participating in discussions, asking questions, and importantly, being on time and staying for the entirety of the course session. The student will succeed in this class by reading the textbook and being prepared for discussions prior to coming to class.

Professional submission of work:

All work is to be completed in a professional way. Handwriting should be neat and readable and work should be submitted on time. All work is to be completed individually by each student. If I indicate that you can work in groups, the work that is produced and turned in must be your own and presented in your own words. Plagiarism is a serious offense in this class. If I find that plagiarism (i.e., presenting the work of others as your own without acknowledgement) has occurred, I will assign zeros for the graded activity and take steps to report a UTC Honor Code violation. Copying information from the internet without proper references is also a severe form of plagiarism and will not be tolerated.

Student Conduct:

The classroom is intended to be a place of learning and repetitive disruptive behavior including the use of phones, or other potentially disruptive devices, chatting, sleeping, and/or playing games on computer may result in removal of student from the classroom and in extreme cases, administrative withdrawal from the course. Please be familiar with UTC's Student Code of Conduct and Honor Code (Academic Integrity Policy) which can be found on the Student Conduct Policy page (<https://www.utc.edu/student-conduct/codes.php>).

Department iPad Use:

iPads will be available for in-class use only and care should be taken when using these devices. Misuse, including downloading of software, images, etc. that violate university policy, and material that is not directly related to the course will result in removal from the course and disciplinary action will be taken. After each use, iPads are to be carefully returned to the storage cart and prepared for next use. The instructor will provide additional instructions about classroom use during the first two weeks of the semester.

Changes to Syllabus:

This syllabus and schedule are tentative; adjustments to the schedule of topics, readings and assignments may be made in accordance with the rate of progress in the classroom. Students will be provided with an updated syllabus if significant changes are necessary.

COURSE ASSESSMENTS AND REQUIRMENTS

Exams: All exams are comprehensive (cover all material that precedes it) but will focus primarily on the most recently covered materials presented in lecture and reading assignments. Exams may include questions of fill-in-the-blank, matching, and multiple-choice set of questions that require short written answers (several well-composed sentences, plus diagrams). The final exam is required of all students.

During all exams, you are only allowed to sit in your seat with a pencil, a calculator (if needed) and the exam. If you bring your phone to an exam, you must leave it at the front of the classroom prior to the start

of the exam and pick it up at that table after the exam. If you are caught with a phone on or near you during an exam, you will receive a zero for the exam and disciplinary action will be taken (report of Honor Code violation).

Lab Practical Exam:

The lab practical exam will consist of multiple minerals that the students must identify, provide information about mineral name, group name, and chemical formula. The mineral challenge and mineral ID quizzes will help students prepare for this exam.

Homework and Activities:

Homework and activities give students the ability to learn through application and will help to further the student's learning of course concepts. Homework and activities will be completed both in and out of class and as part of lab.

Thoughts on Readings:

This course employs a flipped classroom style of learning. This requires student to read materials outside of class in preparation for discussion during the course meeting times. Students will be responsible for reading textbook information prior to coming to class and being well prepared to discuss that material. To support student learning and prepare Dr. Brock-Hon for discussing material that needs to be reviewed, students will submit a short (1/2 page single-spaced) reflection of the reading assignment and provide questions about the material that is confusing and should be supported by classroom discussion. Completion of the Thoughts on Readings will contribute to the overall course grade. Details about what should be include in these 'Thoughts' is on UTC Learn.

e-Portfolio:

All students are required to complete an e-portfolio using Google Sites. An e-Portfolio is a digital way for students to document and display their learning in this course. Later, field trip logs, maps, research and capstone coursework can be displayed and used as a digital resume when submitting applications for internships, jobs, and/or graduate school. Detailed instructions on how to build your e-Portfolio and what information to add are available on UTC Learn.

Mineral Challenge:

The Mineral Challenge trains students to use their deductive reasoning skills through mineral identification and testing of mineral properties. It simulates what students will encounter in the field (e.g., an unknown mineral needing identification). The mineral challenge has both a group and individual component that will enforce skills in teamwork, organization, and mineral identification. Complete information regarding the mineral challenge is provided on the UTC Learn site for this course.

To ensure that all members of the team contribute equally to the Mineral Challenge, the final Mineral Challenge grade for everyone on the team will be calculated using a group participation score computed from peer evaluation scores. At the end of the Mineral Challenge, each student will evaluate their teammates' effort and contributions to the Mineral Challenge. Those scores will be used to assign all or a portion of the mineral ID grade. If you would like details on how this will be calculated, let Dr. Brock-Hon know.

Course Project (Experiential Learning):

A key component of this course is an experiential learning project. To learn more about Experiential Learning at UTC and what this means for you, click [here](#). The course project will involve work solving a problem in the Chattanooga area. More about the project and the requirements are given in the Project module in UTC

Learn. As part of the final project score, students will complete graded reflections on their experience throughout the project.

Field Trip:

There will be one required field trip for this course. The date for this trip is listed in the class schedule. In class, Dr. Brock-Hon will provide more information about what to bring as the field trip date gets closer. Students are required to ride in the official UTC vehicle because of limited parking at field sites or because of the risk to personal vehicles on hazardous roads leading to these sites. Please speak to the instructor if you have any concerns or questions. Exceptions will be considered in the case of extreme circumstances and if it is feasible.

ACAT Exam:

All Geology: Geology, Geology: Environmental, and Geology: STEM Education majors must take the ACAT Geology content exam. The results of this exam will be used by the Geology program to assess teaching and learning in the program. The results of the exam will be reported anonymously and will not count as a part of your grade in this class. **However, all Geology majors must take the exam to receive their final grade for this course.** More information on the ACAT will be provided by Dr. Brock-Hon during the first week of class.

The Mineralogical Society of America Undergraduate Prize:

This award recognizes an student who has shown outstanding achievement in Mineralogy. The awarded student receives a certificate and a student membership in the MSA with access to an electronic version of American Mineralogist and Elements, as well as Reviews in Mineralogy and Geochemistry or Monograph volume chosen by the student. Dr Brock-Hon will select the awardee from this course each semester.

COURSE LECTURE STRUCTURE

This course implements a flipped classroom style lecture. This requires student to read materials outside of class in preparation for discussion during the course meeting times. The generalized structure and expectations for the weekly meetings is provided below. Some changes may be made to accommodate university closings and holidays.

Mondays: Short Thoughts on Readings are due at 8:00am. Reading assignments for next week become available. Discussion of weekly topic.

Wednesdays: Continued discussion of weekly topic. Brock-Hon addresses questions brought up in Thoughts on Readings.

Fridays: Activity or further discussion to support weekly topic.

LECTURE AND LABORATORY SCHEDULE. Due dates for homework, lab activities, and quizzes will be provided when they are assigned.

	Days	Lecture Topic	Lab Topic
Week 1	Aug. 21-25	Introduction to Mineralogy and the Importance of Minerals <i>Geology Majors must complete the ACAT this week</i>	Review of Mineral Properties and Mineral Identification
Week 2	Aug. 28-Sept. 1	Crystallography	The Mineral Challenge 1
Week 3	Sept. 6-8	No class on Monday (Labor Day) Crystallography	LABOR DAY
Week 4	Sept. 11-15	Miller Indices	The Mineral Challenge 2 Mineral Set 1 due

Week 5	Sept. 18-22	Crystal Forms <i>Students sign up for SEM time for Week 10</i>	Introduction to Course Project
Week 6	Sept. 25-29	Earth's Chemistry, Chemical Bonding and the Building of Minerals Friday- Exam 1	Mineral Challenge 3 Mineral Set 2 due Mineral Quiz 1
			Field Trip Saturday, September 30th
Week 7	Oct. 2-6	Coordination of Ions and Crystal Structure	Project
Week 8	Oct. 9-13	Chemical Variation in Minerals and Recalculation of Chemical Analyses	Mineral Challenge 4 Mineral Set 3 due Mineral Quiz 2
Week 9	Oct. 18-20 (GSA)	No class on Monday (FALL BREAK) Building Mineral Formula and Presenting Mineral Data	FALL BREAK
Week 10	Oct. 23-27	Optical Mineralogy <i>Students work on SEM this week for projects</i>	Mineral Challenge 5 Mineral Set 4 due Mineral Quiz 3
Week 11	Oct. 30-Nov. 3	Optical Mineralogy and Other Methods Friday- Exam 2	Project
Week 12	Nov. 6-10	Silicates	Project Mineral Set 5 due Mineral Quiz 4
Week 13	Nov. 13-17	Silicates	Project
Week 14	Nov. 20	No class on Wednesday and Friday (Thanksgiving Break) Non-Silicates	Project Presentations
Week 15	Nov. 27-Dec. 1	Non-Silicates	Mineral Review <i>Exam help sheets due to Brock-Hon</i>
Week 16	Dec. 4	Review <i>ePortfolio due Dec. 5, 9:00am</i>	LAB PRACTICAL
	Wed. Dec. 6	FINAL EXAM (EXAM 3) 8:00-10:00	

GEOL 4800: Research Design

Fall 2023

Department of Biology, Geology, and Environmental Science

Course: GEOL 4800 (CRN: 41128)

Credit: 2 hours

Modality: Face-to-face Instruction

Instructor: Jennifer Taylor

Email Jennifer-Taylor@utc.edu

Phone Number: 423-425-4606

Office: Grote 218-E

Office Hours: Monday 1:00 – 2:30 pm, Tuesday 10:30 – 12 am, and by appointment

Course Meeting Days, Times, and Location: Wednesdays 3:00 – 4:50 pm Grote 208

Course Catalog Description: Seminar and discussion of topics of current interest in the earth sciences. Student presentations required.

Course Pre/Co Requisites: ENGL 2820, GEOL 3420 with a minimum grade of C or department head approval

Course Student Learning Outcomes: Upon completion of this course, it is expected that students will be able to:

- Apply their knowledge of fundamental sciences to interdisciplinary studies of Earth
- Collect and synthesize geotechnical information relevant to a particular research interest
- Communicate geotechnical information by written, oral, and graphical means
- Design geologic research using their knowledge, skills, and critical thinking abilities

Course Fees: \$50.00

Required Course Materials: A dedicated lab notebook and access to a computer.

Technology Skills Required for Course: Students are expected to have the following computer skills:

- Word processing including formatting word processor documents (Microsoft 365 or Google Apps)
- Ability to upload a file to Canvas and orient it the correct way

- It is **your responsibility** to upload a legible file that is oriented right-side-up. **If the file is illegible or the document does not appear** once submitted, **you will receive a zero** on the assignment.
- Email including sending, receiving and email attachments
- Internet searches
- UTC library database searches
- Students must keep their anti-virus definitions up to date

Digital Literacy Skills Required for Course: What skills you will need will depend on the research project that you will complete. You should work directly with your faculty mentor to know which software you'll use and if you need specific skills to use the software (i.e., GIS)

Technology Support: If you have problems with your UTC email account or with UTC Learn (Canvas), contact IT Help Desk at 423-425-4000 or email helpdesk@utc.edu.

Student Technology: If you have technology needs to access your courses and/or complete course requirements in Canvas, [submit a request](#) with Information Technology.

Course Assessments and Requirements: You will be graded on a combination of major and miscellaneous assignments.

Miscellaneous assignments are likely to include:

- Indiana University's plagiarism certificate (<https://plagiarism.iu.edu/index.html>)
- Library instruction exercise
- Abstract, composed in class, for an abstract-free paper (provided)
- Research topic with list of at least 5 preliminary references (accessible papers, preferably in-hand)
- Draft CV (pdf file)
- Completed CV

Major assignments in this class are products of literature research. These include:

- Critical synthesis of literature with an identified area of further research (potential topic for GEOL 4900)
- Presentation of literature research
- First draft of research poster (pdf file)
- Second draft of research poster (pdf file), printed "proof" copy will be provided
- Research poster (24"x36", appropriate layout of text and graphics, citations, etc.) and poster presentation
- GSA undergraduate research grant proposal

Unless otherwise indicated, assignments are due at the beginning of class, on the due date.

Course Grading

Assignments:	Percentage of Grade:
Critical synthesis of literature review and presentation	30%
Drafts of research poster	20%
Research poster and presentation	20%
Miscellaneous assignments (7-10 typical)	15%
Research Proposal	15%

Course Grading Policy: The final letter grade for this class will conform to the following scale, based upon the computed final numerical grade.

F≤60, D=60-70, C=70-80, B=80-90, A=90-100

NOTE: Please bear in mind that an ‘A’ is intended to reflect “superior performance in this course” (see catalog description) and not satisfactory completion of the assigned work (a ‘C’).

Instructor Grading and Feedback Response Time: Grading and feedback by the instructor will be completed as soon as possible, normally within 10 days.

Course and Institutional Policies

Late/Missing Work Policy: There is a penalty of **20% per 24-hours** for late work. Each of the assignments are meant to help you complete the next assignment and in the case of peer reviews, your peers will be waiting on you to turn in your assignment so that they can complete the peer review assignment. Please do your best to submit your work on time.

If an excusable absence on the due date complicates turning in an assignment, a legible scan or photo of the assignment can be sent to the instructor, as an email attachment, before the beginning of class (by the due date and time). The original hard copy of the assignment may still be required

Student Conduct Policy: UTC’s Student Code of Conduct and Honor Code (Academic Integrity Policy) can be found on the [Student Conduct Policy page](#).

Honor Code Pledge: As a student of the University of Tennessee at Chattanooga, I pledge that I will not give or receive any unauthorized assistance with academic work or engage in any academic dishonesty in order to gain an academic advantage. I will exert

every effort to ensure that the Honor Code is upheld by myself and others, affirming my commitment to a campus-wide climate of honesty and integrity.

Course Attendance Policy: Students are expected to attend class regularly.

Course Participation/Contribution: Students are expected to participate in class discussions. Students are expected to be prepared for class, attentive, and respectful of others. To this end, there will be no use of cell phones or similar devices during class. Students are expected to be punctual.

Student Accommodations: If you have accessibility and accommodation requests, contact the [Disability Resource Center](#) at 423-425-4006 or email DRC@utc.edu.

Student Support Resources and Privacy and Accessibility Statements: A list of student resources and privacy and accessibility statements are available on the [WCTL Student Resources Page](#).

Course Learning Evaluation: Course evaluations are an important part of our efforts to continuously improve learning experiences at UTC. Toward the end of the semester, you will be emailed links to course evaluations, and you are expected to complete them. We value your feedback and appreciate you taking time to complete the anonymous evaluations.

Course Calendar/Schedule: *The schedule below is tentative and subject to change.*

Date	Lecture Topic	Assignment Due
23-Aug	Intro to GEOL 4800/4900 and the senior research project in geology	
30-Aug	Library instruction, meet in room 204 of Library with topic to be researched	IU's plagiarism certificate
6-Sep	Reading scientific papers, scientific writing, and referencing in the geosciences: leave class with one annotated reference	Library instruction exercise
13-Sep	Write an abstract for an abstract-free paper (provided), in-class exercise	Research topic with annotated bibliography for 5 in-hand references
20-Sep	Peer Review/Edit of draft CVs	Submit a draft CV to Canvas
27-Sep	Presentation overview - Good, Bad, and Ugly Presentation	Submit final draft of CV to Canvas
4-Oct	Lit review presentation workshop	Critical synthesis of literature with identified area of further research
11-Oct	Presentations of your lit review	Upload your Presentation before class
18-Oct	Work on posters and discussion (focus on content)	

25-Oct	Peer Review/Edit of draft posters Focus on poster design and organization	Compile your poster content into word doc or poster draft Upload 1st draft of research poster (pdf file) to Canvas before class
1-Nov	Work on posters and discussion (peer review and working on posters during class time – bring everything you need)	Upload 1st draft of research poster (pdf file) to Canvas before class Submit 2nd draft of poster (pdf file) for "proof" copy
8-Nov	Writing a research grant proposal	Submit 2nd draft of poster (pdf file) for "proof" copy
15-Nov	Poster presentation practice & peer edit of proposal draft	Upload proposal draft (Word doc) to canvas before class
22-Nov	Thanksgiving Break - No class	
29-Nov	Finalize posters for printing	GSA Undergraduate research grant proposal
11-Dec	Poster Presentations for the faculty (3:30 – 5:30 pm)	

STRUCTURAL GEOLOGY

Fall 2022

GEOL 4510, section 1, CRN 45262, lecture and lab, face-to-face, 4 credit hours

INSTRUCTOR: Jonathan Mies

Email: Jonathan-Mies@utc.edu

Phone: 425-4606

Web page: <https://jwmies.github.io>

b.io/ Office: Grote 218E

Office hours: Monday, Wednesday, and Friday, 9:30-10:30 am Tuesday and Thursday, 11:00 am-12:00 noon Other office hours by appointment

Inquiries will be replied to as soon as possible, normally within 24 hours

MEETING DAYS, TIMES, AND LOCATION

Lecture: Tuesday, Thursday, 9:25-10:40 am

Room: Grote, 208

Lab: Tuesday, 12:15-3:05 pm

Room: Grote, 208

CATALOG DESCRIPTION

Theory and principles of rock deformation, description and classification of common geologic structures, and laboratory methods to solve structural problems. Field trips. Fall semester, alternate years. Lecture 3 hours, laboratory 3 hours.

Prerequisite: GEOL 3420 with a minimum grade of C or department head approval.

Laboratory/studio course fee will be assessed.

PREREQUISITE: GEOL 3420 with a minimum grade of C, or department head approval

COURSE FEES: Geology lab fee, \$50

EXPECTED STUDENT LEARNING OUTCOMES

Upon completion of this course, it is expected that students will be able to:

- Describe and identify rock structures using technically correct language and common classification systems.

- Apply their computational skills and their knowledge of physics and mechanics to studies of rock deformation and resulting structures.
- Interpret and articulate the genesis of common rock structures.
- Relate imperceptibly slow processes of rock deformation to the energy gradients that drive them and the enormous scale of geologic time.
- Formulate a reasonable model of geologic structure based on pertinent data.
- Use common tools and techniques to determine geometric relationships necessary to solving structural problems.
- Relate geologic map patterns to common geologic structures and portray such structures in cross section.
- Critically assess structural-geology-related issues that impact society using their knowledge of rock deformation and resulting structures.

REQUIRED COURSE MATERIALS

TEXTBOOK: Fossen, Haakon, 2016, Structural Geology. 2nd Edition. Cambridge University Press, 524 p.
REQUIRED ISBN: 978-1-107-05764-7.

OTHER: Calculator with trigonometric functions, scale (ruler)/straight edge, protractor, drafting compass, thumbtack (not a push pin), tracing paper, sharp (fine lead, 0.5 mm) mechanical pencil

The UTC Bookstore will price match Amazon and Barnes and Noble (<https://www.barnesandnoble.com/>) prices of the exact textbook - same edition, ISBN, new to new format, used to used format, and used rental to used rental format, with the same rental term. For more information, go to the Bookstore Pricematch Program (<https://utc.bncollege.com/we-price-match>), visit the bookstore, email sm430@bncollege.com, or call 423-425-2184.

TECHNOLOGY REQUIREMENTS

Because some aspects of this course are communicated by email and are to be completed using the internet and UTC Learn (Canvas), access to the internet, via a computer, is required.

TECHNOLOGY SKILLS REQUIRED

Because some aspects of this course are communicated by email and are to be completed using the internet and UTC Learn (Canvas), technology skills necessary to access email and to navigate the internet, via a computer, are required.

TECHNOLOGY SUPPORT

If you have problems with your UTC email account or with UTC Learn (Canvas), contact IT Help Desk at 423-425-4000 or email helpdesk@utc.edu.

STUDENT TECHNOLOGY

If you have technology needs to access your courses and/or complete course requirements in Canvas, submit a request (<https://www.utc.edu/information-technology/technology-resources-for->

[students](#)) with Information Technology.

COMMUNICATION

Course-related communication, outside of the classroom, will be made through UTC Learn (Canvas) and/or UTC email, both of which should be checked on a regular basis.

STUDENT ACCOMMODATIONS

If you have accessibility and accommodation requests, contact the Disability Resource Center (<https://www.utc.edu/disability-resource-center/index.php>) at 423-425-4006 or email DRC@utc.edu.

STUDENT SUPPORT RESOURCES AND PRIVACY AND ACCESSIBILITY STATEMENTS

A list of student resources and privacy and accessibility statements are available on the WCTL Student Resources Page (<https://www.utc.edu/academic-affairs/walker-center-for-teaching-and-learning/utc-learn/student-resources/resources>).

COURSE ASSESSMENT

The final numerical grade for this class will be computed as follows.

12 % Exam 1	_____ x 0.12 = _____.
15 % Exam 2	_____ x 0.15 = _____.
17 % Final Exam (December 8, 8:00 am - 10:00 am)	_____ x 0.17 = _____.
10 % Average of 3 or 4 problem sets	_____ x 0.10 = _____.
12 % Lab midterm exam	_____ x 0.12 = _____.
15 % Lab final exam	_____ x 0.15 = _____.
14 % Average of 10 to 12 laboratory exercises	_____ x 0.14 = _____.
5 % Attendance and participation	_____ x 0.05 = _____.
TOTAL (Final numerical grade) = _____.	

The final letter grade for this class will conform to the following scale, based upon the computed final numerical grade.

F≤60, D=60-70, C=70-80, B=80-90, A=90-100

For this purpose, the final numerical grade will be rounded to the nearest whole number. For example, a grade of 89.4 rounds to 89, which is a **B** (commendable performance in the essentials of the course); a 69.5 rounds to 70, which is a **C** (acceptable performance). Keep in mind that an **A** (90-100) is reserved for superior performance.

GRADING AND FEEDBACK RESPONSE

Grading and feedback by the instructor will be completed as soon as possible, normally within 10 days.

Grades for all exams, quizzes, and assignments will be reported on the basis of 100 points, *i.e.* as a percent value.

EXAMS

Exams will be comprehensive, meaning that each exam will cover all material that precedes it. Although comprehensive, the second exam and the final exam will emphasize material covered since the previous exam.

Exams may include questions of fill-in-the-blank, matching, and multiple-choice formats, and may require computations like those made in class and on problem sets. Exams may also include questions that require short written answers (several well-composed sentences, plus diagrams).

Students are required to show their work for computations and their graphic constructions on exams.

There will be no use of cell phones or similar devices during an exam. Such devices must be silenced and put away (out of sight) during exams.

Students who arrive late for an exam may not be permitted to take the exam.

Make-up exams will be provided in only the most adverse circumstances (*e.g.* serious illness). Documentation of the circumstance (*e.g.* doctor's note) may be required.

EXAMS (Cont'd)

If at all possible, arrangements for a make-up exam must be made with the instructor prior to the scheduled time of the regular exam.

In the event that a student is provided with a make-up exam, he or she should anticipate that it is likely to be different from the regularly administered exam.

ASSIGNMENTS (Problem Sets and Laboratory Exercises)

Students will be required to complete several problem sets and weekly laboratory exercises, which will be graded. Unless otherwise indicated, assignments are due at the beginning of class on the due date.

Students are required to show their work for computations and their graphic constructions on all assignments.

If an absence on the due date complicates turning in an assignment, a legible scan or photo of the assignment can be sent to the instructor, as an email attachment. The assignment must be received by the due date and time (typically before the beginning of class on the due date). The original hard copy of the assignment may still be required.

Late assignments will be accepted in only the most adverse circumstances (e.g. serious illness or accident). Documentation of the circumstance (e.g. doctor's note or police report) may be required.

Failure to turn in an assignment will result in a zero for the missed assignment.

FIELD TRIPS

Field trips are planned for September 27, to a local area, and for the weekend of October 21-23 or November 4-6, to the Grandfather Mountain window and vicinity (Blue Ridge of western North Carolina). The weekend trip will entail 1 or 2 nights camping.

For the local field trip, the instructor will drive a UTC vehicle, which can only hold up to 11 students. Please contact your instructor ahead of this field trip to reserve your seat. Students not riding in the van are expected to meet at one to several field locations within approximately 10 miles of UTC campus. Students will be provided directions to the various sites. Carpooling is encouraged but will not be organized by the professor/instructor. Please speak to the professor/instructor if you have any concerns or questions.

For the weekend field trip, students are required to ride in the official UTC vehicle because of limited parking at field sites or because of the risk to personal vehicles on hazardous roads leading to these sites. Please speak to the instructor if you have any concerns or questions. Exceptions will be considered in the case of extreme circumstances.

ATTENDANCE AND PARTICIPATION

Students are expected to attend class regularly and to participate in class discussions. Attendance and participation is required and will be considered in the final grade. (See Course Assessment.)

Students are expected to be prepared for class, attentive, and respectful of others. To this end, there will be no use of cell phones or similar devices during class.

Students are expected to be punctual.

STUDENT CONDUCT POLICY

UTC's Student Code of Conduct and Honor Code (Academic Integrity Policy) can be found on the [Student Conduct Policy page \(https://www.utc.edu/student-conduct/codes.php\)](https://www.utc.edu/student-conduct/codes.php).

HONOR CODE PLEDGE

As a student of the University of Tennessee at Chattanooga, I pledge that I will not give or receive any unauthorized assistance with academic work or engage in any academic dishonesty in order to gain an academic advantage. I will exert every effort to insure that the Honor Code is upheld by myself and others, affirming my commitment to a campus-wide climate of honesty and integrity

Be aware that it is your instructor's professional obligation to report academic misconduct, which he will not hesitate to do.

TENTATIVE LECTURE SCHEDULE

Date	Tu	Th	Topic	Chapter
Aug	23		Introductions, fundamental concepts of struct. geol.	1
		25	Structural geology and analysis (cont'd), force	1, 4, notes
	30		Force and stress	4, notes
Sep		1	Stress (cont'd), stress in the lithosphere	4, 5
	6		Stress in the lithosphere (cont'd), deformation	5, 2
		8	Deformation and strain (cont'd)	2
	13		Strain (cont'd)	2, 3 (lab)
		15	Strain (cont'd), rheology—stress-strain relations	2, 6
	20		Rheology (cont'd)	6
		22	Rheology (cont'd), review	6, 1 - 5
	27		EXAM 1	1 - 6
		29	Fracture and brittle deformation	7
Oct	4		Brittle deformation (cont'd), joints and veins	7, 8
		6	Joints and veins (cont'd), faults	8
	11		Faults and faulting	9, <i>parts of 17,18,19</i>
		13	Faults and faulting (cont'd)	9, <i>parts of 17,18,19</i>
	18		Fall Break—no class	
		20	Deformation mechanisms—brittle and plastic	11
	21 - 23		Field trip to the Grandfather Mountain window area	alt. Nov. 4-6
	25		Deformation mechanisms (cont'd), review	11, 7-9, [1-6]
		27	EXAM 2	7-9, 11 [1 - 6]
Nov	1		Folds and folding	12
		3	Folds and folding (cont'd)	12, <i>parts of 17</i>
	4 - 6		Field trip to the Grandfather Mountain window area	alt. Oct. 21-23
	8		Folds (cont'd), foliation and cleavage	12, <i>parts of 17, 13</i>
		10	Foliation and cleavage (cont'd)	13
	15		Lineations	14
		17	Boudinage	15
	22		Shear zones and mylonites	16
		24	Thanksgiving Holiday—no class	
	29		Shear zones and mylonites (cont'd)	16
Dec		1	Shear zones and mylonites (cont'd), review	16,12-15[1-9, 11]
Dec		8	FINAL EXAM, Thursday, Dec. 8, 8:00 - 10:00 am	12-16, [1-9, 11]

TENTATIVE LAB SCHEDULE

Date	Tu	Topic	Chapter
Aug	23	Planes and tabular units ... orientation and dimensions ... orthographic projection	
	30	Planes and their poles and basic applications of spherical projection	Appx B
Sep	6	Strain experiments—simple shear	Ch. 2, 2.15
	13	Practical strain measurement—strain in rocks	Ch. 3
	20	Lines and planes ... trend, plunge, pitch, rotations, etc spherical and ortho. proj.	Appx B
	27	Local field trip to collect structural data	
Oct	4	Advanced applications of spherical projection, structural analysis	Appx B
	11	LAB MIDTERM EXAM —Orthographic and spherical projection	
	18	Fall Break—no class	
	25	Structure contour, form-line contour, isopach, and isochore maps	
Nov	1	Introduction to geologic map patterns—planes, tabular units, and topography	
	8	Map patterns of folds and faults	
	15	Construction of cross sections	
	22	Retrodeformation and balanced cross sections	Ch. 21
	29	LAB FINAL EXAM	

COURSE LEARNING EVALUATION

Course evaluations are an important part of our efforts to continuously improve learning experiences at UTC. Toward the end of the semester, you will receive a link to evaluations and you are expected to complete them. We value your feedback and appreciate you taking time to complete the anonymous evaluations.

This syllabus is subject to change.

Sedimentary Rocks and
Stratigraphy The University of
Tennessee at Chattanooga

**Department of Biology, Geology, and Environmental Science
Spring 2020**

Course:	GEOL 3540 (CRN:22467)
Modality:	Face-to-face classroom instruction
Credit:	4 hours
Meeting Days/Times:	Lecture: Tuesdays and Thursdays 12:15-1:30 Lab: Tuesdays 1:40-4:30
Lecture Room:	Grote Hall 208
Instructor:	Ashley Manning-Berg, Ph.D. Office: 218-A Grote Hall Phone: 423-425-4407 Email: Ashley-Manning-Berg@utc.edu
Office Hours:	Monday 1:00 – 3:00 PM, Thursday 2:00 – 4:00 PM, or by appointment . I have an open-door policy , if you stop by and I'm available to help, I will. <u><i>If I cannot meet with you at that time, we can set up a scheduled time that works for both of us.</i></u> Students may also contact me via email or by phone. I will do my best to respond by email within 48 hours <u><i>on weekdays</i></u> . Response time over the weekend (Friday after 5 until Monday at 9) will take longer.
Course description:	Sedimentary rocks and stratigraphic correlation with emphasis on the classic stratigraphy of eastern North America, the facies concept, and paleogeographic reconstruction of the continents. Field trips.
Pre-Requisite:	Mineralogy (GEOL 3410) with a grade of C or better
Co-Requisite:	Sedimentary Rocks and Stratigraphy Lab (3540L)

Expected Course Student Learning Outcomes:

The overarching purpose of this course is to help you “think like a geologist” and, in this way, to become a better geologist. Sedimentology and Stratigraphy uses the sedimentary record to accomplish this big goal, by way of the objectives below. By the end of this course, you will be able to do the following:

- Acquire and interpret data from sedimentary deposits to reconstruct the processes that formed and

modified them.

- Collect data or use existing data, at a variety of scales (outcrop to grain) to formulate and test a hypothesis about the nature and distribution of sedimentary environments or facies in space.
- Interpret changes in depositional environment through time (stratigraphic change) at a variety of spatial and temporal scales, based on data from sedimentary rocks and successions, and propose a defensible mechanism for those changes
- Communicate, verbally and in writing, your interpretations of a sedimentary environment, and defend your interpretation using data.

Required Materials:

Textbooks:

Principles of Sedimentology and Stratigraphy 5th ed., by Sam Boggs Jr.; Pearson, ISBN: 9780321643186.

Sedimentary Rocks in the Field: A Colour Guide, 1st ed., by Dorrik A.V. Stow, Taylor and Francis Group, ISBN:9781874545699

You will also need:

- Hand lens – you received one in mineralogy.
- Grain size card – I will supply one during the first week of class.
- Field notebook – you will record your observations in this notebook for each of your projects
- Colored pencils –I highly recommend the erasable kind (Crayola has some)
- Straight edge/scale – Drawing straight lines is very handy in this course
- Sharpie Marker – you'll need this when we go into the field

Supplemental Course Materials:

[Folk, R.L., The Petrology of Sedimentary Rocks \(Links to an external site.\)](#) (Hemphill Publishing Co., Austin, TX). This is a free online text; an oldie but a goodie!!

In addition, a number of texts and reference books are available in my office or, sometimes, in the classroom. If a book is particularly relevant for a topic, I'll move it to the classroom, where you are free to use it. Please don't take books out of the classroom without first checking with me.

I will post links to web sites relevant to the course here, as well as datasets that you will need for some/all of the projects and exercises. Sometimes, I may not be as efficient at getting to you with an answer as one of your colleagues, so I will also open a "discussion board" on Canvas so that you can post questions/comments to each other. You may also email each student in the course from Canvas.

Technology Requirements for Course: Some course information and several out-of-class activities and assignments will require you to have access to a computer with Adobe Reader, Microsoft Word, Microsoft Excel, Microsoft PowerPoint, and Google Earth. Adobe Reader is available for download for free from: <https://get.adobe.com/reader/otherversions/>. Microsoft Word is free for students and can be downloaded from the university at: <http://www.utc.edu/information-technology/services/software-students.php>. Google Earth can be downloaded for free from: <https://www.google.com/earth/download/ge/agree.html> **Note: All of these are available to you for free on the library computers.**

Technology Skills Required for Course: Skills required to successfully complete this course include being able to use email, access and navigate UTC Learn, search the web for information, use Microsoft Office

Suite, and open .pdf documents. You will also be expected to learn how to use Google Earth. **You must be able to access UTC Learn by the end of the first week of classes.** If you have problems with your UTC email account or with UTC Learn, contact the IT Solutions Center at 423.425.4000 or itsolutions@utc.edu

Technology Support: If you have problems with your UTC email account or with UTC Learn, contact IT Solutions Center at 423-425-4000 or email itsolutions@utc.edu.

Communication: To enhance student services, the University uses your UTC email address for all communications. Check your UTC email at least once a day. Students are expected to communicate in a clear and professional manner. Because this is a place of learning, if I consider communication from a student to be unprofessional, I will request that the communication be re-submitted.

Tips for emailing your professor: Please be sure to include a salutation in your email and to sign your email. Signing your email ensures that I know who sent me an email. In the subject line, please include the course number “GEOL 3540.” I also urge you to consider the tone of your emails. Please be respectful in your emails, even towards the end of the semester, and be sure to reread your email prior to sending it to ensure that it sounds professional.

Course Assessments and Requirements:

Short Assignments: Most of the short in-class or homework assignments that we work on will require you to hand in some type of worksheet, write-up, or lab activity. These short assignments are designed to give you *practice* with the techniques you’ll need to accomplish the projects. I don’t think it’s fair to ask you to practice, then grade you based on whether you did it right. So, I give you *feedback only* on these activities, aimed at ensuring that you understood the main point of the exercise. I will also use these assignments to see where misconceptions might lie and to try to correct them. I will assess these on the basis of the following criteria:

- Did you put in the effort that was necessary to do the assignment?
- Did you take some care in completing the assignment?
- Did you get the main point?

Don’t look for fine-toothed-comb grading. I will assess these assignments using the following rubric:

Feedback	Meaning
Excellent (5)	Put in <i>more effort than required</i> to complete the assignment; no grammatical/spelling errors; work is neat and professional; computations correctly done, work is easy to follow; clearly expresses the main point; contains unusually insightful or in-depth commentary or analysis. Includes significant material from the reading and class discussions.
Very Good (4)	Put in <i>sufficient effort</i> to complete the assignment; no grammatical/spelling errors; work is neat and professional; computations correctly done, work is easy to follow; clearly understands the main point; shows a degree of insight and effort beyond the average. Brings some material from the reading and class discussions.
Good (3)	Put in just <i>enough effort</i> to complete the assignment; work is neat and professional; only minor grammatical/ spelling errors; computations correctly done, but work difficult to follow; appears to have understood the main point, but some doubt remains in my mind. Brings minimal material from the reading and class discussions.

Fair (2)	<i>Didn't quite complete the assignment</i> as outlined; more than a few grammatical/ spelling errors; work is somewhat sloppy and unprofessional; computations incorrectly done; evidence suggests that the main point was mostly missed. Includes little or no material from the reading and class discussions.
Poor (1)	Assignment essentially <i>incomplete</i> ; many grammatical/spelling errors (if a write-up is required); work is sloppy and unprofessional; computations incorrectly done; little evidence that the main point was understood. Did not bring in material from readings or class discussion.
Not submitted (0)	Did not turn in the assignment, or turned an assignment in late

Some lab-like assignments require more effort on your part. These assignments have the same general goal as the short, in-class assignments: to give you practice with specific techniques you'll need. In most cases, I will use the rubric above, unless the assignment requires its own.

Grade Component	Weight
Four quizzes	20%
Project 1: Sedimentology Jigsaw	15%
Project 2: Core Logging and Soil Analysis	15%
Project 3: Delta Table	15%
Project 4: Basin Scale Controls: Book Cliffs	15%
Portfolio review of all of the projects (including revisions, if any)	10%
Final Exam	10%
Total	100%

Projects: The four projects form the most important part of the course. You should certainly expect to work on these projects outside of class, but a lot of the work that we do in class is directed toward completing these projects. The final reports for these projects will be assessed based on a rubric that you will receive prior to the project deadline. However, perhaps more important than the individual grades on these projects will be an assessment of how you have progressed throughout the semester. As a result, I offer the following:

Portfolio: You will turn in your **original** reports *for all four projects* by the last day of finals week (not the day of the final). This is *in addition* to submitting each of these separately on the specified due dates. I will use this as a portfolio to assess your progress toward achieving the objectives I laid out above.

- You may additionally improve the grade on any or all individual project reports by revising it and turning it in by the last day of classes as an **appendix** to the project portfolio. In this revision, you may use information from the entire course to improve the write-up for an earlier project.

Quizzes: Each of the projects requires that you have mastered some core material from readings, class discussions, lectures, activities, and other sources. It is critical that you bring this material to bear on your projects and that it be integrated into your thinking.

Course Grading

Course Grading Policy: The total number of points you earn from exams, activities, quizzes, etc. will be totaled and the percentage of points you have earned at the end of the semester out of all that were available to earn will be used to assign your letter grade as outlined below. Please keep in mind that Canvas may not always reflect your most accurate grade.

<u>Grade</u>	<u>Percentage of total points earned</u>
A	90.0 or more
B	80.0-89.9
C	70.0-79.9
D	60.0-69.9
F	below 59.9

NOTE: *Please keep in mind that an ‘A’ is intended to reflect “superior performance in this course” and not satisfactory completion of the assigned work (a ‘C’).*

Instructor Grading and Feedback Response Time: I will do my best to get feedback on your work back to you within a week and a half of submittal. In some instances, (during conference travel, etc.) it may take longer than a week. All grades will be posted in the Canvas Gradebook.

Extra Credit Opportunities: As a general rule, do not expect to have an opportunity for extra credit. On the **EXTREMELY RARE** occasion that extra credit is offered, details will likely be discussed in class and may or may not be posted on Canvas. **Do not rely on these opportunities to raise your class grade!**

Any sporadic opportunity for extra credit will be given to the entire class. **I will not assign one student an extra credit opportunity to raise their (test, project, midterm, or final) grade. I will not respond to emails asking for extra credit at the end of the semester.**

Attend lectures and lab sessions, keep up with reading assignments, ask questions, and hand in your work on time. If you do all of this, you will succeed in this course and won’t have time or need for extra credit. That said, there may be occasional, sporadic opportunities for limited extra credit, but it will be more difficult to earn points this way than to earn them in the original assignment. Again, do not rely on these opportunities to raise your grade.

Course and Institutional Policies

Late/Missing Work Policy: The two main reasons for insisting on deadlines involve fairness. All students in the course share the same deadline; it is unfair if one student receives a deadline extension. Second, I grade all submissions together and do my best to return them to you within a week and a half of submission (fair warning: I don’t always succeed!). This ensures maximum uniformity in assessment; when I receive assignments over a longer period of time, it interferes with my ability to be uniform in assessing submissions. For these reasons, *all* late material will be deducted 10% per 24-hour period. If you require an extension due to unforeseen circumstances, you must communicate with me prior to the deadline so that we can work out an alternative. **I will not accept work that is not turned in within 10 days of the due date. Furthermore, if a piece of work was not turned in for initial assessment within 10 days of the due date, you may not submit a revised version in your portfolio for full credit.**

Student Conduct Policy: UTC’s Academic Integrity Policy is stated in the Student Handbook (<https://www.utc.edu/dean-students/student-handbook.php>).

Honor Code Pledge: I pledge that I will neither give nor receive unauthorized aid on any test or assignment. I understand that plagiarism constitutes a serious instance of unauthorized aid. I further pledge that I exert every effort to ensure that the Honor Code is upheld by others and that

I will actively support the establishment and continuance of a campus-wide climate of honor and integrity.

Course Attendance Policy: I work hard to make class time productive, so that you can push the limits of your knowledge. In return, I expect you to attend class and be ready to learn, to be alert and responsive in class and lab, to turn in assignments on time, and to work together with your classmates to advance everyone's learning experience. Much of what we'll do in this class occurs in "real time," and it's difficult to make up those missed moments. Please let me know as soon as possible if you will miss class or lab, so that we can find solutions that cause minimum disruption for your learning or that of others in the course.

Course Participation/Contribution: I recognize that this class seems like it will be a lot of work. The class is designed to give you first-hand experience using sedimentology to investigate and solve scientific problems, but you will have to participate to get the most out of the course. That said, I hope that the course will be fun and engaging for you. I expect you to be respectful of everyone in the class and their ideas as we discuss topics in class and work together in small groups.

Course Learning Evaluation: Course evaluations are an important part of our efforts to continuously improve learning experiences at UTC. Toward the end of the semester, you will be emailed links to course evaluations and you are expected to complete them. We value your feedback and appreciate you taking time to complete the anonymous evaluations.

UTC Bookstore: The UTC Bookstore will price match Amazon and [BN.com](https://www.bn.com) prices of the exact textbook - same edition, ISBN, new to new format, used to used format, and used rental to used rental format, with the same rental term. For more information, go to the [Bookstore Price Match Program](#) webpage, visit the bookstore, email sm430@bncollege.com or call 423-425-2184.

***Note: Many elements of this syllabus were inspired by and adapted from the sed/strat syllabus of Tom Hickson at the University of St. Thomas, Julie Bartley at Gustavus Adolphus University, and Ann Holmes at the University of Tennessee at Chattanooga.*

Course Calendar/Schedule:

Week	Date	Topic	Due
1	7-Jan	Welcome and Introduction to Sedimentology and Stratigraphy Lab: Writing Sedimentary Rock Descriptions	
	9-Jan	Sedimentary Rocks: Siliciclastics	
2	14-Jan	Sedimentary Rocks: Carbonates and Evaporites Lab: Sedimentary Processes and Provenance	
	16-Jan	Weathering	

3	21-Jan	Fundamentals of Fluid Flow Lab: Core logging and Soil Analysis	Project 1: Sedimentary Processes and Provenance
	23-Jan	Particle Transport	Quiz: Sedimentary Rock Basics
4	28-Jan	Sedimentary Structures Lab: Core Logging and Soil Analysis	
	30-Jan	Sedimentary Structures	
5	4-Feb	Sedimentary Structures Activity: Paleocurrents	Project 2: Core Logging and Soil Analysis
	6-Feb	Bedforms	Quiz: Weathering, Fluid Flow, Transport
6	11-Feb	Bedforms Lab: Delta Table	
	13-Feb	Sedimentary Strata and Walther's Law	
7	18-Feb	Sedimentary Strata Lab: Delta Table	
	20-Feb	Depositional Environments	
8	25-Feb	Depositional Environments Lab: Facies Analysis	Project 3: Delta Table
	27-Feb	Depositional Environments	Quiz: Depositional Environments, Sedimentary Structures, and Strata
9	3-Mar	Sea Level Change Lab: Facies Analysis	
	5-Mar	Sea Level Change	Facies Analysis
10	10-Mar	Spring Break	
	12-Mar	Spring Break	
	17-Mar	Sedimentary Successions: Facies Lab: Correlations	

11	19-Mar	Sedimentary Successions	
12	24-Mar	Geologic Time and Stratigraphy Lab: Stratigraphy	Correlations Lab
	26-Mar	Geologic Time and Stratigraphy	Quiz: Sea Level Change and Geologic Time
13	31-Mar	Stratigraphy Lab: Stratigraphy	
	2-Apr	Stratigraphy	
14	7-Apr	Stratigraphy Lab: Book Cliffs	Stratigraphy Lab
	9-Apr	Basin Analysis	Quiz: Stratigraphy
15	14-Apr	Basin Analysis Lab: Book Cliffs	
	16-Apr	Future Directions in Sedimentology	Project 4: Book Cliffs Lab
16	21-Apr	Reading Day	
	23-Apr	Final Exam 10:30 am - 12:30 pm	

*** This schedule is **EXTREMELY** tentative and **WILL** be altered. I will notify you of any changes via in-class announcements and/or Canvas announcements

The University of Tennessee at Chattanooga

PETROLOGY

Spring 2023

GEOL 3420, section 0, CRN 20034, lecture and lab, face-to-face, 4 credit hours

INSTRUCTOR: Jonathan Mies

Email: Jonathan-Mies@utc.edu

Phone: 425-4606

Web page: <https://jwmies.github.io>

b.io/ Office: Grote 218E

Office hours: Monday, Wednesday, and Friday, 10:30-11:30 am Tuesday and Thursday, 9:00-10:00 am Wednesday and Thursday, 1:00-2:00 pm
Other office hours by appointment

Inquiries will be replied to as soon as possible, normally within 24 hours

MEETING DAYS, TIMES, AND LOCATION

Lecture: Monday, Wednesday, Friday, 9:00-9:50 am	Room:
GROTE 210 Lab:	Monday, 2:00-3:50 pm
Room: GROTE 210	

CATALOG DESCRIPTION

In-depth study of igneous and metamorphic rocks, including classification, genesis, and evolution. Field trips. Spring semester. Lecture 3 hours, laboratory 3 hours. Prerequisites: GEOL 3410 with a minimum grade of C or department head approval. Laboratory/studio course fee will be assessed.

PREREQUISITE: GEOL 3410 with a minimum grade of C or department head approval

COURSE FEES: Lab/Studio Fee

EXPECTED STUDENT LEARNING OUTCOMES

Upon completion of this course, it is expected that students will be able to:

- Describe and identify igneous and metamorphic rocks based on study of hand samples and study of thin sections using

- a petrographic microscope.
- Describe and identify igneous and metamorphic rocks using technically correct language and common classification systems.
 - Apply their computational skills and their knowledge of fundamental sciences to solve commonly encountered petrologic problems.
 - Interpret the genesis of common igneous and metamorphic rocks and associations thereof.
 - Formulate a reasonable model of igneous and metamorphic processes, in the context of plate tectonics, based on relevant data.
 - Relate imperceptibly slow igneous and metamorphic processes to the energy gradients that drive them and the enormous scale of geologic time.

REQUIRED COURSE MATERIALS

TEXTBOOK: Winter, John D., 2010, Principles of Igneous and Metamorphic Petrology, 2nd ed.
REQUIRED Pearson Education, Inc., 702p., ISBN-13 978-0-32-159257-6.

SUGGESTED Nesse, William D., 2017, Introduction to Mineralogy, 3rd Edition, Oxford University Press, New York, ISBN: 9780190618384, Chapter 7 (Optical Mineralogy) and mineral (optical) properties. NOTE: This is the current Mineralogy (GEOL 3410) textbook, *i.e.* retained from last semester.

The UTC Bookstore will price match Amazon and Barnes and Noble (<https://www.barnesandnoble.com/>) prices of the exact textbook - same edition, ISBN, new to new format, used to used format, and used rental to used rental format, with the same rental term. For more information, go to the Bookstore Pricematch Program (<https://utc.bncollege.com/we-price-match>), visit the bookstore, email sm430@bncollege.com, or call 423-425-2184.

OTHER: Calculator, scale (ruler)/straight edge

TECHNOLOGY REQUIREMENTS

Because some aspects of this course are communicated by email and are to be completed using the internet and UTC Learn (Canvas), access to the internet, via a computer, is required.

TECHNOLOGY SKILLS REQUIRED

Because some aspects of this course are communicated by email and are to be completed using the internet and UTC Learn (Canvas), technology skills necessary to access email and to navigate the internet, via a computer, are required.

TECHNOLOGY SUPPORT

If you have problems with your UTC email account or with UTC Learn (Canvas), contact IT Help Desk at 423-425-4000 or email helpdesk@utc.edu.

STUDENT TECHNOLOGY

If you have technology needs to access your courses and/or complete course requirements in Canvas, submit a request (<https://www.utc.edu/information-technology/technology-resources-for-students>) with Information Technology.

COMMUNICATION

Course-related communication, outside of the classroom, will be made through UTC Learn (Canvas) and/or UTC email, both of which should be checked on a regular basis.

STUDENT ACCOMMODATIONS

If you have accessibility and accommodation requests, contact the Disability Resource Center (<https://www.utc.edu/disability-resource-center/index.php>) at 423-425-4006 or email DRC@utc.edu.

STUDENT SUPPORT RESOURCES AND PRIVACY AND ACCESSIBILITY STATEMENTS

A list of student resources and privacy and accessibility statements are available on the WCTL Student Resources Page (<https://www.utc.edu/academic-affairs/walker-center-for-teaching-and-learning/utc-learn/student-resources/resources>).

COURSE ASSESSMENT

The final numerical grade for this class will be computed as follows.

12 % Lecture Exam 1	_____ x 0.12 = _____.
15 % Lecture Exam 2	_____ x 0.15 = _____.
17 % Lecture Final Exam, Apr. 26, 8:00-10:00 am	_____ x 0.17 = _____.
10 % Average of several problem sets	_____ x 0.10 = _____.
12 % Lab Midterm Exam	_____ x 0.12 = _____.
15 % Lab Final Exam	_____ x 0.15 = _____.
14 % Average of several laboratory exercises	_____ x 0.14 = _____.
5 % Attendance and participation	_____ x 0.05 = _____.

TOTAL (Final numerical grade) = _____.

The final letter grade for this class will conform to the following scale, based upon the computed final numerical grade.

F≤60, D=60-70, C=70-80, B=80-90, A=90-100

For this purpose, the final numerical grade will be rounded to the nearest whole number. For example, a

grade of 89.4 rounds to 89, which is a **B** (commendable performance in the essentials of the course); a 69.5 rounds to 70, which is a **C** (acceptable performance). Keep in mind that an **A** (90-100) is reserved for superior performance.

GRADING AND FEEDBACK RESPONSE

Grading and feedback by the instructor will be completed as soon as possible, normally within 10 days.

Grades for all exams, quizzes, and assignments will be reported on the basis of 100 points, *i.e.* as a percent value.

LECTURE EXAMS

Lecture exams will be comprehensive, meaning that each exam will cover all material that precedes it. Although comprehensive, the second exam and the final exam will emphasize material covered since the previous exam.

Exams may include questions of fill-in-the-blank, matching, multiple-choice, and short-answer formats (several well- composed sentences, plus diagrams), and may require graphic constructions and computations like those made in class or on problem sets.

Students are required to show their work for all constructions and computations on exams.

There will be no use of cell phones or similar devices during an exam. Such devices must be silenced and put away (out of sight) during exams.

Students who arrive late for an exam may not be permitted to take the exam.

Make-up exams will be provided in only the most adverse circumstances (*e.g.* serious illness). Documentation of the circumstance (*e.g.* doctor's note) and/or notification from the Office of Student Outreach and Support may be required.

LECTURE EXAMS (cont'd)

If at all possible, arrangements for a make-up exam must be made with the instructor prior to the scheduled time of the regular exam.

In the event that a student is provided with a make-up exam, he or she should anticipate that it is likely to be different from the regularly administered exam.

LAB EXAMS

Lab (practical) exams will be comprehensive, meaning that each exam will cover all material that precedes it. Although comprehensive, the Lab Final Exam will emphasize material covered since the Lab Midterm Exam.

Lab exams will cause students to describe and identify igneous and metamorphic rocks and the minerals

they contain based on study of hand samples and the study of thin sections using a petrographic microscope.

Students are required to show their work for all constructions and computations on exams.

Policies regarding cell phones, tardiness, and make-up exams described for lecture exams also apply to lab exams.

ASSIGNMENTS (problem sets and laboratory exercises)

Students will be required to complete several problem sets and several laboratory exercises, which will be graded. Unless otherwise indicated, assignments are due at the beginning of class on the due date.

Students are required to show their work for all constructions and computations on assignments.

If an absence on the due date complicates turning in an assignment, a legible scan or photo of the assignment can be sent to the instructor, as an email attachment. The assignment must be received by the due date and time (typically before the beginning of class on the due date). The original hard copy of the assignment may still be required.

Late assignments will be accepted in only the most adverse circumstances (*e.g.* serious illness or accident). Documentation of the circumstance (*e.g.* doctor's note) and/or notification from the Office of Student Outreach and Support may be required.

Failure to turn in an assignment will result in a zero for the missed assignment.

FIELD TRIP

An all-day field trip is tentatively planned for **Saturday, March 25**. Please keep this date available.

For this field trip, students are required to ride in the official UTC vehicle because of limited parking at field sites or because of the risk to personal vehicles on hazardous roads leading to these sites. Please speak to the instructor if you have any concerns or questions. Exceptions will be considered in the case of extreme circumstances.

ATTENDANCE AND PARTICIPATION

Students are expected to attend class regularly and to participate in class discussions. Attendance and participation is required and will be considered in the final grade. (See Course Assessment.)

Students are expected to be prepared for class, attentive, and respectful of others. To this end, there will be no use of cell phones or similar devices during class.

Students are expected to be punctual.

STUDENT CONDUCT POLICY

UTC's Student Code of Conduct and Honor Code (Academic Integrity Policy) can be found on the [Student Conduct Policy page \(https://www.utc.edu/student-conduct/codes.php\)](https://www.utc.edu/student-conduct/codes.php).

HONOR CODE PLEDGE

As a student of the University of Tennessee at Chattanooga, I pledge that I will not give or receive any unauthorized assistance with academic work or engage in any academic dishonesty in order to gain an academic advantage. I will exert every effort to insure that the Honor Code is upheld by myself and others, affirming my commitment to a campus-wide climate of honesty and integrity

Be aware that it is your instructor's professional obligation to report academic misconduct, which he will not hesitate to do.

TENTATIVE LECTURE SCHEDULE

	M	W	F	Topic	Chapter
Jan	9			Intro to GEOL 3420, Fundamental concepts	1
		11		Fundamental concepts (cont'd)	1
			13	Fundamental concepts (cont'd), class. and nom. of ign. rocks	1,2
	16			Holiday—no class	
		18		Classification and nomenclature of ign. Rocks (cont'd)	2
			20	Class. and nom. of ign. rocks (cont'd), text. of ign. rocks	2,3
	23			Textures of igneous rocks	3
		25		Textures (cont'd), Ign. structures/field relationships	3,4
			27	Ign. Structures and field relationships	4
	30			Igneous structures/field relationships (cont'd), phase rule	4,6
Feb		1		Phase rule (cont'd) and phase diagrams—1 and 2 comp.	6
			3	Phase diagrams—1 and 2 components (cont'd)	6
	6			Phase diagrams—1 and 2 comp (cont'd), more than 2 comp.	6,7
		8		Phase diagrams—more than 2 components	7
			10	Phase diagrams—more than 2 components (cont'd)	7
	13			Phase diagrams (cont'd), <i>review</i>	7, 1-4, 6,7
		15		EXAM 1	1-4, 6,7
			17	Major and minor element chemical petrology	8
	20			Major and minor element chemical petrology	8
		22		Trace element and isotope chemical petrology	9
			24	Trace element and isotope chemical petrology	9
	27			Mantle melting and the generation of basaltic magma	10
Mar		1		Mantle melting and the generation of basaltic magma	10
			3	Magma diversity	11
	6			Magma diversity	11
		8		Selected tectonic setting(s) of igneous activity	parts of 13,16,17 and/or 19
			10	Selected tectonic setting(s) of igneous activity	parts of 13,16,17 and/or 19
	13			Spring Break—no class	
		15		Spring Break—no class	
			17	Spring Break—no class	
	20			Selected tectonic setting(s) of ign. activity (cont'd), <i>review</i>	8-11,±13,16,17,19 [1-4,6,7]
		22		EXAM 2	8-11,±13,16,17,19 [1-4,6,7]
			24	Introduction to metamorphic petrology	21
Saturday, March 25, Field Trip					

TENTATIVE LECTURE SCHEDULE (cont'd)

	M	W	F	Topic	Chapter
Saturday, March 25, Field Trip					
Mar	27			Introduction to metamorphic petrology (cont'd)	21
		29		Classification of metamorphic rocks	22
			31	Structures and textures of metamorphic rocks	23
Apr	3			Structures and textures of metamorphic rocks (cont'd)	23
		5		Stable mineral assemblages in metamorphic rocks	24
			7	Holiday—no class	
	10			Stable mineral assemblages (cont'd)	24
		12		Metamorphic facies and metamorphosed mafic rocks	25
			14	Metamorphic facies and metamorphosed mafic rocks (cont'd)	25
	17			Metamorphic reactions	26
		19		Metamorphic reactions (cont'd)	26
			21	Metamorphism of pelitic sediments	28
	24			Metamorphism of pelitic sediments (cont'd), <i>review</i>	28, 21-26, 28
Apr		26		FINAL EXAM , Wed., April 26, 8:00 - 10:00 am	1-4,6-11,±13-19,21-26,28

TENTATIVE LABORATORY SCHEDULE

	M	Topic
Jan	9	Optical properties of isotropic and uniaxial minerals, the petrographic microscope
	16	Holiday—no class
	23	Optical properties of biaxial minerals, etc., more with the petrographic microscope
	30	Igneous minerals and textures, study of igneous rocks in hand sample and thin section
Feb	6	Granitoids 1
	13	Granitoids 2
	20	Diorites, gabbros, and anorthosites
	27	Volcanic rocks
Mar	6	Lab Midterm Exam
	13	Spring Break—no class
	20	Metamorphic minerals and textures
	27	Metamorphosed mafic rocks (metabasites)
Apr	3	Metamorphosed mudstones and shales (metapelites)
	10	Metamorphosed calcareous rocks
	17	Cataclastic and mylonitic rocks
	24	Lab Final Exam

COURSE LEARNING EVALUATION

Course evaluations are an important part of our efforts to continuously improve learning experiences at UTC. Toward the end of the semester, you will receive a link to evaluations and you are expected to complete them. We value your feedback and appreciate you taking time to complete the anonymous evaluations.

This syllabus is subject to change.

The University of Tennessee at Chattanooga
GEOL 4900 Senior Research Project

Spring 2023
CRN 23338, 2 credit hours

INSTRUCTORS: Dr. Ashley

Manning-Berg Email: [ashley-](mailto:ashley-manning-berg@utc.edu)

manning-berg@utc.edu

Phone: 423-425-4407

Office: Grote 218A

Office hours: Mondays 1 – 3:30 pm, Thursdays 3:00 – 4:30 pm, and by appointment. If the door is open, feel free to stop in and ask if I'm available.

Inquiries will be replied to as soon as possible, normally within 24 hours.
Inquiries received outside of normal business hours (M-F: 9-6 pm) will be answered the following business day.

MEETING DAYS, TIMES, AND LOCATION

Wednesdays 12:00-2:50 pm

FINAL EXAM SCHEDULE

Wednesday, April 26, 10:30-12:30

CATALOG DESCRIPTION

Culminating senior experience giving students an opportunity to design and conduct research related to geological problems. Spring semester.

PREREQUISITE: GEOL 4800 and department head approval.

COREQUISITE: None

EXPECTED STUDENT LEARNING OUTCOMES

Upon completion of this course, it is expected that students will be able to:

- Apply their knowledge of fundamental sciences to interdisciplinary studies of Earth
- Design and conduct geologic research using their knowledge, skills, and critical thinking abilities
- Communicate geotechnical information by written, oral, and graphical means

TEXTBOOK: None

TECHNOLOGY REQUIREMENTS

Because some aspects of this course are communicated by email and UTC Learn (Canvas), access to the internet, via a computer, is required. Access to a computer and the internet is essential to completing the assignments in this course.

TECHNOLOGY SKILLS REQUIRED

Because some aspects of this course are communicated by email and using UTC Learn (Canvas), technology skills necessary to navigate the internet, via a computer, are required. Such technology skills are also essential to research expectations of this course. Required software includes Adobe Acrobat Reader, Microsoft Word, Microsoft Excel, and Microsoft PowerPoint. Individual projects may require specialized software such as ArcMap, GFW, or others. Students should consult with their faculty research mentors to determine their specific software needs and related instruction.

Adobe Reader is available for download for free from: <https://get.adobe.com/reader/otherversions/>.

Microsoft Office software is free for students and can be downloaded from the university at: <http://www.utc.edu/information-technology/services/software-students.php>.

COMMUNICATION

Course-related communication will be made through UTC Learn (Canvas) and/or UTC email, both of which should be checked on a regular basis.

TECHNOLOGY SUPPORT

If you have problems with your UTC email account or with UTC Learn, contact IT Solutions Center at 423-425- 4000 or email itsolutions@utc.edu.

COURSE ASSESSMENT

The final numerical grade for this class will be computed as follows.

15 %	Research notebook and reflections	_____	x 0.15 = _____.
10 %	Presentation of data collection and progress to date	_____	x 0.10 = _____.
10 %	Presentation of methodology and progress to date	_____	x 0.10 = _____.
10 %	Presentation of prelim. results and progress to date	_____	x 0.10 = _____.
10 %	Abstract	_____	x 0.10 = _____.
10 %	Draft of poster	_____	x 0.10 = _____.
25 %	Poster presentation	_____	x 0.25 = _____.
5 %	Attendance	_____	x 0.05 = _____.
5 %	Participation	_____	x 0.05 = _____.

The final letter grade for this class will conform to the following scale, based upon the computed final numerical grade.

F≤59, D=60-70, C=70-80, B=80-90, A=90-100

For this purpose, the final numerical grade will rounded to the nearest whole number. For example, a grade of 89.4 rounds to 89, which is a B; a 69.5 rounds to a 70 which is a C.

As per the UTC Undergraduate Catalog, grades of *A*, *B*, *C*, and *D* denote superior, commendable, acceptable, and marginal performance; an *F* denotes unqualified failure.

GRADING AND FEEDBACK RESPONSE

Grading and feedback by the instructor will be completed as soon as possible, normally within 10 days.

RESEARCH AND THE RESEARCH ADVISOR

In this course, students are expected to design, conduct, and document geologic research.

Students should have a faculty research mentor (Drs. Brock-Hon, DeVries, Hossain, Manning-Berg, or Mies, or Mr. Brodie) to advise (supervise) them in their research efforts. Regardless of the mentor and the advice he or she provides, it is the student's responsibly to meet deadlines described in this syllabus and to keep Drs. DeVries and Manning-Berg informed of any complications that arise and any significant changes that are anticipated. With this in mind, you should keep your research advisor informed of your progress and how it relates to upcoming deadlines.

Unless otherwise indicated, all assignments are due at the beginning of class on the due date.

Late assignments will be accepted in only the most adverse circumstances (e.g. serious illness or accident). Documentation of the circumstance (e.g. doctor's note or police report) may be required. Otherwise, you will receive a grade of zero for the assignment.

Research notebook

Students will keep a digital lab notebook that they will use when performing research. Keeping detailed and organized notes of your research is a key element to scientific research. You will record measurements, basic data interpretation, and your progress in these notebooks. There will be periodic checks of the lab notebook.

Reflections

Each week, you will take some time to reflect on the progress you have made in your research that week. Recognize that there will be weeks that you may not make as much progress on your research as you would like; that is normal. However, your goal is to constantly move your research forward throughout the semester. Reflecting on your progress will demonstrate even small steps you have taken to move the project forward. There will also be a reflection at the

beginning of the semester to identify what you believe are your strengths and challenges as you go into the research. Similarly, there will be a reflection at the end of the semester that will focus on how your research went overall and what you might do differently if you were to redo the research.

PowerPoint presentations

Students will provide brief presentations on important aspects of their research plans using PowerPoint, specifically

(1) data collection and processing and (2) methodology. Students will also present their preliminary results in similar fashion. Presentations will be limited to 10 minutes and will, ideally, be followed by brief discussion and peer review.

Abstract

The abstract must adhere to guidelines and limitations (2,000 character limit, not counting spaces, no graphics) used for abstracts published by the Geological Society of America (GSA). The abstract, due at the time that the draft poster is due, should be turned in as a separate document.

Poster

The poster, both draft and final, should be complete with respect to (1) **abstract**, (2) **problem to be addressed** or **hypothesis to be tested**, (3) **background** or **introduction** (provides context and importance of project), (4) **methodology**, (5) **results**, including **interpretations** and **conclusions**, and (6) **references cited**, each with appropriate headings and subheadings. Of course, the poster should also include a **title**, **author's name**, **affiliation**, and **contact information** and should make good use of graphics, *e.g.* maps for regional setting and location, outcrop photos, charts and graphs, *etc.*, with north arrow, scale, *etc.*, as appropriate. Graphics from other publications should be redrawn or modified to better serve the purpose of the poster and the source should be appropriately cited.

Citations and the list of references cited should be in GSA format. Anticipate that the poster will be 24" x 36" (landscape) when making choices of layout, font size, *etc.* To avoid formatting issues, all posters should be submitted as a .pptx file. PDF will not be accepted.

ATTENDANCE AND PARTICIPATION

Students are expected to attend class regularly and to participate in class discussions. Attendance and participation will be considered in the final grade. (See Course Assessment.) Students are expected to be punctual, prepared for class, attentive, and respectful of others.

Date	Topics	Due
11-Jan	Welcome - Expectations of course	
18-Jan	Project Timelines (Meet with Advisor Before Class)	Project Timeline
25-Jan	Research Notebooks and Tips	
1-Feb	Presentations on Methods and Progress	Presentation due before class
8-Feb	Writing the methods section	
15-Feb	Individual Meetings	Research Notebook with Reflection

22-Feb	Displaying Data	
1-Mar	Presentation of Progress	Presentation due before class
8-Mar	Writing up results	Research Notebook with Reflection
15-Mar	Spring Break	
22-Mar	Presentation of Primary Results	Presentation due before class
29-Mar	Making Conclusions	Research Notebook with Reflection
5-Apr	Work on Poster Presentations	Abstract
12-Apr	Poster Feedback	Poster Draft due before class
19-Apr	Finalizing posters	Final Poster due by 11:59 pm
26-Apr	Poster Presentation 10:30-12:30	

Appendix 1-K



Vision

We engage students, inspire change and enrich community.

Mission

The University of Tennessee at Chattanooga is a driving force for achieving excellence by actively engaging students, faculty and staff, embracing diversity and inclusion, inspiring positive change and enriching and sustaining our community.

Values

- We believe that **students** are the reason our institution exists.
- We affirm the essential function of a **liberal arts** education.
- We commit to transformational **engagement** with our community.
- We nurture a culture of **creativity**, **scholarship** and **innovation**.
- We embrace **diversity** and **inclusion**.
- We pursue **excellence** in all that we do.
- We live **integrity** and **civility**.

“Strategy implies movement from a present position to a desirable but uncertain future position.”

Betteke van Ruler, *International Journal of Strategic Communication* (2018)

The University of Tennessee at Chattanooga commenced its 2025 strategic planning process on the eve of an unprecedented global pandemic and in the shadow of a looming “[demographic cliff](#),” anticipated to dramatically shrink the pool of traditional, college-going young Americans eligible for and interested in attaining college degrees. Meanwhile, the value of a traditional liberal arts education has been challenged like never before, and society has been stressed by strident public discourse.

In this moment, our University has proven to itself and its stakeholders that we can adapt and thrive. We have also been reminded of the abiding and essential value of the collegiate experience UTC offers. What we do and how we do it has never been more important. We believe we can do it even better in the next five years.

Our students continue to value a personalized academic and campus experience in America’s best mid-sized city. Our community counts on us to drive change and enhance our region’s competitiveness in the global marketplace. Our region needs innovative scholarship, creative activity and entrepreneurship. Our society needs diverse citizens capable of leading in a challenging world.

The objectives, strategies and tactics implicated in this plan leverage our University’s strengths and respond to the identified aspirations of the students and community we serve. To the extent they take us “out of our comfort zone,” they demand a level of risk that we owe to our students and to their futures.

“True strategy is about placing bets and making hard choices.”

Roger L. Martin, *Harvard Business Review* (2014)

UTC will transform the lives of our students and the futures of our region by increasing access to a distinctive model of education, grounded in the liberal arts and tied closely to workforce opportunities.



ASSUMPTION: UTC can play a unique role in ensuring the competitiveness of our region by preparing our students to compete in a global workforce.

BY 2025 WE WILL...

- Effectively recruit a larger and more diverse student population
 - Develop a strategic enrollment management plan that includes key components to support student growth (e.g., student demographics, feeder institutions, public policy implications, labor market and workforce development, competition and market share, market opportunities and data usage)
 - Increase total enrollment from 11,457 to 12,950, with a particular focus on traditionally underrepresented groups and the state's performance-based funding formula focus populations
 - Increase the number and percentage of new transfer students from 867 to 1,107 (from 7.4% to 8.5%)
 - Increase the number and percentage of new graduate students from 346 to 442 (3.0% to 3.4%)
 - Increase the number and percentage of new freshmen students from 2,222 to 2,576 (19.0% to 19.9%)
 - Expand student support services to align with undergraduate and graduate enrollment goals
- Improve student performance
 - Increase freshman fall-to-fall retention from 73% to 83%
 - Reduce achievement and learning gaps
 - Increase six-year graduation rate from 53% to 63.7%
 - Achieve a student-athlete graduation success rate (GSR) of at least 85% each year
- Define and promote UTC's distinctive educational experience
 - Develop and implement a *Reimagined General Education* Program that offers a signature experience to UTC students while respecting and honoring [Tennessee Transfer Pathways](#)
 - Implement curricular changes to ensure all students are prepared to live, work and engage in reasoned discourse in a diverse, global society.
 - Promote intellectual and cultural engagement through the liberal and fine arts as an important part of the student's UTC experience
 - Embed [high impact practices](#) within the GenEd curriculum
 - Implement and expand *Cohort2025* to include all first-year students
 - Require all departments to embed [high impact practice](#) for degree eligibility

- o Develop and launch a [Quality Enhancement Plan](#) (QEP) that is aligned with this strategic plan, central to the university's educational experience, and focused on student success
 - o Increase enrollment in Honors programs from 3% to 5%
 - o Benchmark and increase the number and percentage of students participating in campus organizations
 - o Benchmark and increase community-engaged learning opportunities
 - o Support excellence in teaching by expanding access to pedagogical development resources
- More tightly align educational offerings to regional workforce needs (including curricular, co-curricular, extra-curricular and stackable credential opportunities)
- Double the number of [online degree](#) programs, from 9 to 20

UTC will respond to the needs of students and our region by modeling inclusive excellence through diverse representation and aligned benchmark indicators.



ASSUMPTION: By enhancing diversity, UTC will better serve our students, faculty, staff and region.

BY 2025 WE WILL...

- Build a community that cultivates and respects diversity as essential for UTC success and regional competitiveness
 - Support diversity through transparent organizational planning efforts
 - Improve recruitment and retention strategies and outcomes for underrepresented faculty and staff (and benchmark relative to state, community, and student demographics)
 - Increase the diversity of internal and external stakeholders across all units of the university
 - Enhance opportunities for students, faculty and staff to learn and work in a socially and culturally diverse world
 - Provide opportunities for the campus community to listen with empathy, learn from diverse points of view and engage each other with civility and respect
 - Establish faculty, administrator and staff goal-setting and performance evaluations based on the recognition and support of a diverse workforce.
- Continue to internationalize the University
 - Remove institutional barriers to recruitment of undergraduate and graduate international students
 - Increase the number of international students at UTC by 10% annually
 - Increase the number of UTC students participating in study abroad programs to at least 2.5% of the student population, with an 85% retention/graduation rate for study abroad alumni
 - Increase internal and external support for faculty pursuing international teaching and research opportunities
 - Increase global competency outcomes within the curriculum
 - Expand extracurricular opportunities for domestic and international student interaction
- Expand [inclusive](#) access
 - Enhance support for students, including the UTC Library's [Affordable Course Materials Initiative](#) (ACMI), to ensure greater access to learning resources
 - Benchmark and increase support services for students with disabilities
- Increase the engagement of diverse alumni and volunteers in UTC advisory boards and advocacy outreach

UTC will impact our community and enhance the educational experience of our students by sustaining the scholarly, creative and entrepreneurial activity of our faculty and students.



ASSUMPTION: UTC adds value to the educational enterprise and enhances the vitality of our region by engaging in applied scholarship and creative activity.

BY 2025 WE WILL...

- Expand research capacity
 - Increase research expenditures (as reported to NSF) by 7% annually (from \$10.8 million to \$16.2 million)
 - Require each college to produce a research agenda with measurable outcomes aligned with the UTC Strategic Plan and inclusive of cross-college collaborative research
 - Enhance institutional research infrastructure and develop new research support programs with centralized “core resources” (facilities, technology, ORSP and technical personnel) necessary to support campus-wide research and creative endeavors
 - Benchmark and increase graduate student support and research productivity
 - Benchmark and increase the number of undergraduate students participating in faculty-supervised research and creative endeavors by 10%
 - Increase veteran, first generation and minority student participation in research and creative endeavors by 10%
 - Support increased faculty research productivity
 - Develop a transparent method of assessing the quality of research output
 - Benchmark and increase the number of citations, peer reviewed journal articles and other scholarly publications and activities by 5% per year
 - Benchmark and track research with impact in the community
 - Benchmark and increase the production of scholarship and creative endeavors that explore and amplify diverse perspectives
- Invest resources in up to three strategic areas of opportunity for multi-disciplinary, cross-disciplinary, and inter-disciplinary research activity to advance a profile of excellence and community impact
- Benchmark and increase collaboration with community partners on community-impact projects
- Engage alumni and other community members in mentoring and support networks for faculty and student scholarly, creative and entrepreneurial endeavors

UTC will ensure the sustainability of our institution and the vitality of our students, faculty, staff and community by excelling in resource development and stewardship.



ASSUMPTION: UTC will continue to operate in an environment of finite resources but has the opportunity and obligation to strengthen and leverage our assets to benefit our students and community.

BY 2025 WE WILL...

- Develop a forward-looking resource base with a focus on expanding revenue streams
 - Maintain a competitive tuition structure relative to the UT system, LGI institutions and peers
 - Maximize state appropriations by enhancing Tennessee outcomes-based funding formula performance
 - Raise \$100,000,000 in new gifts
 - Increase the Annual Giving (as defined by UTFI) to UTC by 5% per year
 - Increase the number of donors by 5% per year
 - Generate additional funds from Auxiliary Services to enhance the campus experience
 - Think and act like entrepreneurs across all departments by exploring revenue generation opportunities that add value to strategic partners
- Continue physical transformation of campus
 - Maintain existing facilities and develop new ones to support expanding academic programs, research activities, and supporting units
 - Ensure that a campus master plan update continues to develop campus in support of transformational education, research, and engagement
- Establish operational transparency: expand and refine institutional culture of assessment to provide data-informed decision support
 - Require that institutional resources are aligned with strategic plan and provide transparent accounting of space and budget allocation
 - Produce dashboards for budget, Foundation, experiential learning, equity, and student success metrics
 - Establish a student-faculty-support feedback loop to maximize the effectiveness of UTC's instructional technologies (e.g. Canvas, Kaltura, etc.) and benchmark and increase the utilization and effectiveness of training and support provided to instructors
- Establish a technology plan to ensure currency of all campus hardware and software
- Improve the university's web utilization
 - Conduct an assessment of the current website (with user input) and develop a site improvement plan
 - Implement a campus-wide calendaring and targeted communication platform to improve information flow and participation in campus events

- Develop and implement a comprehensive campus community health and wellness plan
 - Create a culture and environment that prioritizes the holistic wellness of the UTC community
 - Benchmark and track comprehensive campus health and wellness initiatives
 - Update, communicate, and maintain all-hazards emergency management plans for natural, biological, technological, and fabricated disasters impacting the campus
- Adapt financial aid models to optimize access and affordability
 - Benchmark and increase resources for student scholarships and graduate assistantships
 - Commission a feasibility study on alternate financial aid models
- Produce and distribute annual State Impact Reports, to document the relationship between state support and UTC excellence
- Establish and sustain lifetime strategic engagements
 - Develop service-learning opportunities for students and ensure that the city and region become a “living and learning” community
 - Implement reporting processes to effectively and consistently record and compile outreach and engagement activity for students, faculty, and staff (including experiential learning and civic engagement activity)
 - Build a strong alumni engagement program that has appropriate resources to thrive and become a focal point between our past and future
 - Develop and embrace an “Employer of Choice” model for UTC. Ensure that UTC is recognized as a national and/or regional model for “Best Places to Work”
 - Celebrate community engagement and service by faculty, staff, and students by giving credit for civic engagement as a hallmark of a community-engaged public university
 - Maximize the relationship between the campus and the University of Chattanooga Foundation, Inc.
 - Review current and best practices and identify optimal structures and operations for advisory councils and committees

UTC committed to a strategic planning process that was transparent, thorough, inclusive and aligned with the UT System planning framework.



UTC's strategic planning process, under the leadership of Provost Jerold Hale, has consisted of a series of overlapping and recursive elements:

1) *IDEA GENERATION*

This process was powered by the work of four subcommittees, one for each of UTC's four strategic focus areas. Each subcommittee included representation of faculty, exempt and non-exempt staff, students and community members and developed its own process and identified its own resource base to collaboratively draft initial objectives and strategies for its respective focus area.

2) *SYNTHESIS*

The subcommittees' drafts were then provided to an "integration committee" (also comprised of faculty, staff, student and community representatives), which worked to standardize the drafts and, when appropriate, redistribute recommendations across priority areas.

3) *REFLECTION*

The revised framework was then redistributed to the subcommittees to ensure fidelity to the original inputs and seek additional recommendations.

4) *STAKEHOLDER INPUT*

Campus stakeholders provided input on strategic opportunities, priorities, and approaches to measurement via an online portal.

5) *REFLECTION / SYNTHESIS*

Those broad-based inputs were then used to refine the strategic planning framework and verify alignment with the UT System plan, with the result shared again with the integration committee.

6) *MEASUREMENT WORKSHOPPING*

Subject matter experts (SME's) and UTC's Office of Planning, Effectiveness and Institutional Research (OPEIR) were engaged to identify baselines, benchmarks and measurement approaches for elements of the strategic framework.

7) *STAKEHOLDER INPUT*

Campus and community stakeholders were again invited to use an online input portal to provide reactions and suggestions on the emerging framework elements.

8) *REFLECTION / SYNTHESIS / MEASUREMENT WORKSHOPPING*

Stakeholder input was again used to refine the framework, vet with the integration committee and assess with SME's and OPEIR.

9) *STAKEHOLDER INPUT*

Campus and community stakeholders were engaged, this time via zoom focus groups.

10) *REFLECTION / SYNTHESIS*

A final framework was developed with the campus Executive Leadership Team.

11) *CAMPUS ADVISORY BOARD REVIEW – October 4, 2021*

pending

12) UT SYSTEM BOARD REVIEW – October 22, 2021

pending

UTC's strategic plan was produced by faculty, staff, students and community members.



Integration (a.k.a. “steering”) Committee

Jerold Hale (Chair)	Provost	Academic Affairs	Staff
Tom Griscom	Co-Facilitator	External	Community
David Steele	Co-Facilitator Chief of Staff	Chancellor's Office	Staff
Michelle Deardorff	Department Head and Adolph S. Ochs Professor of Government	Political Science and Public Service	Faculty
Fred Decosimo	Chair	UTC Advisory Board	Community
Christine Estoye	Director of MBA Programs	RCOB, Exempt Staff Council	Staff
Vicki Farnsworth	Vice Chancellor and Chief Information Officer	Information Technology	Staff
Tyler Forrest	Vice Chancellor	Finance and Administration	Staff
Yancy Freeman	Vice Chancellor	Enrollment Management and Student Affairs	Staff
Lane Gutridge	President	Student Government Association	Student
Jamie Harvey	Associate Professor of Health and Physical Education K-12 and Past Faculty Senate President	CHEPS	Faculty
Shewanne Baptiste	Howard- MPH Interim Program Director and Associate Professor	Exercise Science, Public Health	Faculty
Scott LeRoy	Member	UTC Advisory Board	Community

Stacy Lightfoot	Chair	Chancellor's Multicultural Advisory Council	Community
Daniel Pack	Dean	CECS	Staff
Melita Rector	Chair	Employee Relations Committee	Staff
Joanne Romagni	Vice Chancellor and Dean	Research, Graduate School	Staff
Charlene Simmons	UC Foundation Associate Professor Communication, Current Faculty Senate President	CAS, Faculty Senate	Faculty
Gina Stafford	Interim Vice Chancellor	Marketing and Communications	Staff
Lauren Ingraham	Vice Provost	Academic Affairs	Staff

 Teaching and Learning Subcommittee

Lauren Ingraham (Co-Chair)	Professor	English	Faculty
Pam Riggs-Gelasco (Co-Chair)	Co-Chair and Dean	CAS	Staff
Emily Blackman	Assistant Vice Chancellor for Athletic Academic Enhancement	Athletics	Staff
Ethan Carver	Assistant Dean	Graduate School	Staff
Michael Danquah	Associate Dean	CECS	Staff
Taylor Flores	Student Representative	Student Government Association	Student
Stacie Grisham	Assistant Vice Chancellor for Student Success	Enrollment Management and Student Affairs	Staff
Cherry Guinn	Professor and Coordinator Post-Master's Academic Nurse Educator	CHEPS	Faculty

Laura Livermore	Director of Study Abroad Programs	Center for Global Education	Staff
Andrew McCarthy	Department Head of English, UC Foundation Associate Professor, & Head of the Council of Academic Department Heads	CAS	Faculty
Catherine Middleton	Director of Assessment and Lecturer of Economics	RCOB	Faculty
Caden Pace	Student Representative	Student Government Association	Student
Stephanie Philipp	Assistant Professor of Education	CHEPS	Faculty
Steve Ray	Professor, Associate Head of Performing Arts	CAS	Faculty
Mike Thompson	Department Head of History & UC Foundation Associate Professor	CAS	Faculty
Sherese Williams	Assistant Director	Honors College	Staff
Claudia Williamson	Scott L. Probasco Distinguished Chair of Free Enterprise, Director of the Center for Economic Education and Professor of Economics	RCOB	Faculty

 Diversity and Inclusion Subcommittee

Chris Horne (Co-Chair)	Dalton Roberts Professor of Public Administration and MPA Program Coordinator	Political Science and Public Service	Faculty
Christopher Stokes (Co-Chair)	Assistant Director	Office of Multicultural Affairs	Staff
Jay Blackman	Senior Associate AD – Strategic Communications	Athletics	Staff
Will Davis	Outreach Manager and Producer	WUTC	Staff

Rosite Delgado	Director	Office of Equity and Inclusion	Staff
Michael Dinkins	Senior Information Security Officer	Information Technology	Staff
Jennifer Ellis	Director of STEM Education and Associate Professor	CHEPS	Faculty
Christine Estoye	Director of MBA Programs	RCOB, Exempt Staff Council	Staff
Linda Frost	Dean	Honors College	Staff
Kim Thomas	Director	Joseph F. Decosimo Success Center, RCOB	Staff
Patricia Lin-Steadman	Assistant Director of the Office of International Student and Scholar Services	Center for Global Education	Staff
Andrea Lyons	Associate Director	Alumni Affairs	Staff
Tara Mathis	Associate Dean of Students, Director of the Multicultural Center and Director of Veteran Student Services	Dean of Students	Staff
Matt Matthews	Vice Provost and Professor of Mathematics	Academic Affairs	Faculty
Marshara Miller	Student Representative	Student Government Association	Student
Tiffany Mitchell	Senior Lecturer of English	CAS	Faculty
Edwin Murillo	Associate Professor of Spanish	CAS	Faculty
Abeer Mustafa	Associate Vice Chancellor for Student Affairs	Enrollment Management and Student Affairs	Staff
Isaiah Owens	Student Representative	Student Government Association	Student
Joseph Owino	Dept. Head of Civil and Chemical Engineering UC and Foundation Professor	CECS	Faculty
Laure Pou	Assistant Vice Chancellor	Human Resources	Staff

Melita Rector	Chair	Employee Relations Committee	Staff
Valerie Rutledge	Dean	CHEPS	Staff
Megan Shadrick	Web Project Manager and Business Manager	Marketing and Communications	Staff
Stephanie Todd	Senior Lecturer of English	CAS	Faculty



Research and Innovation Subcommittee

Bento Lobo (Co-Chair)	Department Head of Finance and Economics and First Tennessee Bank Distinguished Professor of Finance	RCOB	Faculty
Reinhold Mann (Co-Chair)	Deputy Vice Chancellor	Research	Staff
Zoe Aebie	Student Representative	Student Government Association	Student
William Andrews	President	Graduate Student Association	Student
Chris Cox	Department Head and Professor for Mathematics	CAS	Faculty
Theresa Liedtka	Dean	Library	Staff
Daniel Loveless	UC Foundation Associate Professor of Electrical Engineering	CECS	Faculty
Laurie Melnik-Allen	Executive Director of the Arts-Based Collaborative, Professor of Practice and Lyndhurst Chair of Excellence in Arts Education	CHEPS	Faculty
Tony Parsley	Associate Chief Information Officer	Information Technology	Staff
Meredith Perry	Director	Research and Sponsored Programs	Staff
Lisa Piazza	Director	Undergraduate Research and Creative Endeavor	Staff

Melissa Powell	Associate Lecturer of Dietetics	CHEPS	Faculty
Mina Sartipi	Director of the Center for Urban Informatics and Progress and UC Foundation Professor of Computer Science and Engineering	CECS	Faculty
Marty Smith	Senior Associate Vice Chancellor	Development and Alumni Affairs	Staff
Gina Stafford	Interim Vice Chancellor	Marketing and Communications	Staff
John Trussel	UC Foundation Professor of Accounting	RCOB	Faculty
Chandra Ward	Assistant Professor of Sociology	CAS	Faculty



Resources and Stewardship Subcommittee

Tyler Forrest (Co-Chair)	Vice Chancellor	Finance and Administration	Staff
Vicki Farnsworth (Co-Chair)	Vice Chancellor and Chief Information Officer	Information Technology	Staff
Taylor Bradshaw	Student Representative	Student Government Association	Student
Richard Brown	Special Advisor to the Chancellor	Finance and Administration	Staff
Allison Evans	Director of Budget	Academic Affairs	Staff
John Freeze	Director	Center for Professional Education	Staff
Andrew Horton	Senior Associate AD - External Operations	Athletics	Staff
Thomas Lyons	Clarence E. Harris Chair of Excellence in Entrepreneurship and Professor of Marketing and Entrepreneurship	RCOB	Faculty

Sherry Marlow-Ormsby	Executive Director, Office of Planning, Evaluation and Institutional Research	Academic Affairs	Staff
Andrea Neely	UC Foundation Assistant Professor of Management	RCOB	Faculty
Robie Robinson	Assistant Vice Chancellor	Emergency Services	Staff
Brian Rogers	Director of Library IT	Library	Staff
Charlene Simmons	UC Foundation Associate Professor Communication, Current Faculty Senate President	CAS, Faculty Senate	Faculty
Lofton Stuart	Interim Vice Chancellor of Development and Alumni Affairs and Executive Director of the UC Foundation, Inc.	Development and Alumni Affairs	Staff
Takeo Suzuki	Executive Director	Center for Global Education	Staff
Kenny Tyler	Director of Engineering and Planning Services	Facilities Planning and Management	Staff

Appendix 1-L



"[A]rts and sciences are branches of the same tree. All these aspirations are directed toward ennobling [a person's] life, lifting it from the spheres of mere physical existence and leading the individual towards freedom." – Albert Einstein, 1937

*"Education serves democracy best when it prepares us for just the kinds of questions we face now: questions about a wider world, about our own values, and about difficult choices we must make both as human beings and citizens.....The approach to higher learning that best serves individuals, our globally engaged democracy and an innovating economy is **liberal education**."* – Association of American Colleges & Universities (AAC&U), Board of Directors, 2002

"Those persons, whom nature has endowed with genius and virtue, should be rendered by liberal education worthy to receive and able to guard the sacred deposit of the rights and liberties of their fellow citizens; and. they should be called to that charge without regard to wealth, birth or other accidental condition or circumstance." – Thomas Jefferson, 1779

*"When we ask about the relationship of a liberal education to citizenship, we are asking a question with a long history in the Western philosophical tradition. We are drawing on Socrates' concept of 'the examined life,' on Aristotle's notions of reflective citizenship, and above all on Greek and Roman Stoic notions of an education that is 'liberal' in that **it liberates the mind from bondage of habit and custom, producing people who can function with sensitivity and alertness as citizens of the whole world.**"* – Martha Nussbaum, *Cultivating Humanity: A Classical Defense of Reform in Liberal Education*, 1998

*"This approach to liberal education – already visible on many campuses – erases the artificial distinctions between studies deemed liberal (interpreted to mean that they are not related to job training) and those called practical (which are assumed to be). **A liberal education is a practical education because it develops just those capacities needed by every thinking adult: analytical skills, effective communication, practical intelligence, ethical judgment, and social responsibility.**"* – *Greater Expectations: A New Vision for Learning as a Nation Goes to College*, AAC&U, 2002

"You want the inside of your head to be an interesting place to spend the rest of your life." – Judith Shapiro, former President of Barnard College

"[O]ne cannot live by equations alone. The need is increasing for workers with greater foreign language skills and an expanded knowledge of economics, history and geography. And who wants a technology-driven economy when those who drive it are not grounded in such fields as ethics?" – Norman Augustine, former Chairman and CEO of the Lockheed Martin Corporation, 2013

"More than achieving the competence to solve problems and perform complex tasks, education means attaining and sustaining curiosity and humility. It means growing out of an embattled sense of self into a more generous view of life as continuous self-reflection in light of new experience, including the witnessed experience of others." – Andrew Delbanco, author of *College: What It Was, Is, and Should Be*, 2012

Strategic Plan

The College of Arts and Sciences at the University of Tennessee at Chattanooga proudly celebrates and champions liberal education, an approach to teaching and learning that aims to liberate the human mind from habit and ignorance by emphasizing a broad and well-rounded course of study in the humanities, the fine arts, and the social, behavioral, and natural sciences. A liberal education prepares individuals to think critically and creatively, to communicate clearly, and to reflect on complexity, diversity, and change along our social, cultural, technological, and scientific horizons. In doing so, a liberal education cultivates a sense of personal and social responsibility, strong intellectual and practical skills (*e.g.*, written and verbal communication skills, analytical skills, information literacy, and problem-solving skills) that cross disciplinary boundaries and fields of study, along with the ability to apply such knowledge and skills in real-world settings.¹

Dedicated to essential academic pursuits—instruction, research, creative expression, and public service—the College of Arts and Sciences at the UTC pursues excellence in undergraduate and graduate education as its principal mission. The College’s top priority, therefore, is effective teaching in our major, minor, and graduate programs—programs through which students are educated for enriched lives and successful careers. Through its role in providing the majority of the University’s General Education program, along with our rigorous undergraduate and graduate programs, the College pursues a particular commitment to strengthen the intellectual skills of all students while developing their awareness and appreciation of the humanities, the fine arts, and the social, behavioral, and natural sciences.

The College of Arts and Sciences identifies in what follows its strategic plan for 2015-2020. This plan aligns with the Institutional Strategic Plan (ISP); articulates our mission, vision, values, and goals; helps us communicate and advocate for the College of Arts and Sciences on campus and in our community; and identifies priorities, strengths, and opportunities.

MISSION

- provide an environment for intellectual curiosity and a foundation for life-long learning, thinking, reflection, and growth
- equip students with transferrable skills—critical thinking, communication, and complex problem solving skills—that are needed to adapt and succeed in a rapidly evolving world
- advance cultural and intellectual diversity (*e.g.*, studying competing theories as well as intellectual advancements within and beyond Western traditions)
- advance new knowledge through research (theoretical and applied) and creative activities
- advance integrated service as a part of personal and social responsibility

¹ According to a 2013 survey conducted by Hart Research Associates on behalf of Association of American Colleges and Universities, 74% of employers would recommend a liberal education to college-bound students. A full report on the survey and its complete findings is available at www.aacu.org/leap.

VISION

The enduring vision of UTC's College of Arts and Sciences is...

to transform lives through a modern liberal arts and sciences education.²

VALUES

Faculty, staff, and students in the College of Arts and Sciences value a **positive work and learning environment** as we likewise embrace **cultural and intellectual diversity** and practice **innovative teaching and mentorship**. We value a **foundational education** that leads to a life that is enriched by **continuous learning**. We value **scholarly research and creative expression**. We value being engaged with the **Chattanooga community**, as well as our **regional and global partners** and our ever-expanding **intellectual communities**. As such, our values are summed up in four words: **collaboration, inclusion, creativity, and innovation**.

GOALS

Goal 1: This College leads the university, community, and region in providing an essential liberal arts and sciences education that prepares students for an increasingly global context and economy. The Association of American Colleges & Universities (AAC&U), through its "Liberal Education and America's Promise" or LEAP campaign, has developed essential learning outcomes for a 21st century liberal education to which we must aspire as a College of Arts and Sciences. Those essential learning outcomes are available at <http://www.aacu.org/leap/essential-learning-outcomes>. Consistent with LEAP's essential learning outcomes, we aim to accomplish the following subgoals.

- a. Promote a **liberal education** and broadly communicate the value of such an educational experience. (ISP 1g)
- b. Actively **recruit** and **retain** undergraduate and graduate students; **increase degree completion rates**. (ISP Goal 3a)
- c. Mindfully **integrate up-to-date technology and sustain best teaching practices** to provide students in the College with the best possible 21st century classroom and learning experience. This includes increasing the accessibility and modality of courses that make up the General Education curriculum. (ISP Goal 1)
- d. Expand points of contact, outreach communication, and opportunities for **engagement and relationship building with UTC graduates and key constituents of the College to facilitate external support**. (ISP Goal 3)
- e. Increase opportunities and preparation for students, faculty, and staff to have an **international or study abroad experience** to ensure first-hand exposure to global examples of cultural, architectural, intellectual and scientific achievement. (ISP 4c; see Goal 3c in this plan)

² The phrase "liberal arts and sciences education" comes from our national organization, the Council of Colleges of Arts & Sciences. Like the CCAS, we use the phrase to reflect our commitment to liberal education in the context of a comprehensive College of Arts and Sciences.

Goal 2: The College of Arts and Sciences values and promotes human achievement in the social sciences, behavioral sciences, natural sciences, humanities, and fine arts. In doing so, we celebrate human achievements—*i.e.*, publications, performances, exhibitions, outstanding teaching, research, and more—both within and beyond our disciplines.

- a. Provide undergraduate and graduate programs that offer a **framework for personal and professional growth and that expose students to the scope and range of human achievement** in the arts and sciences. (ISP 1c, 1g)
- b. Provide instruction and enable student learning through **innovative teaching strategies**, including flipped classrooms, team-based learning, problem-based learning, facilitations and presentations, online and hybrid instructional delivery. (ISP 1d, 2d)
- c. **Increase student participation in research and creative activities** under faculty guidance. (ISP 1b, 2a)
- d. **Showcase and reward faculty/student research and creative achievement** through department- and college-level awards, grant funding, reassigned time, and more. (SP 3h)
- e. Participate in and/or sponsor **campus and community activities that promote cultural engagement and highlight achievements in the social sciences, behavioral sciences, natural sciences, humanities, and fine arts.** (ISP 1g)

Goal 3: The College of Arts and Sciences embraces cultural and intellectual diversity.

The College of Arts and Sciences—its leadership, faculty, and staff—is committed to a campus culture that respects the inherent worth of every person and that is enriched by our diverse backgrounds.

- a. Participate in the implementation of an institutional diversity plan by creating a **college-level diversity plan** which defines and sets clear metrics for diversity of faculty, staff, and students. (ISP 4a, 4d)
- b. Advocate for a **culture of inclusion**, including physical and technological access for students, faculty and staff with disabilities. (ISP 4b)
- c. Increase opportunities for students, faculty, and staff to have an **international or study abroad experience** to ensure first-hand exposure to global examples of cultural, architectural, intellectual and scientific achievement. (ISP 4c)
- d. Offer educational opportunities that **promote an awareness of and an appreciation of divergent worldviews.**
- e. Showcase and promote **multidisciplinary and interdisciplinary research, teaching, and creative activities.**

Goal 4: The College of Arts and Sciences cultivates new knowledge through research (theoretical and applied) and creative activities that engage students, faculty, and community partners.

- a. Increase student involvement in **experiential learning, research, creative endeavors, internships, senior capstone projects, practica, and service.** (ISP 1)

- b. Promote greater **student engagement in research and creative activity**, including the presentation of student/faculty work in scholarly and creative outlets. (ISP 1)
- c. Pursue **faculty workload that is consistent with experiential learning objectives**. (ISP Goal 4a, 4b)
- d. **Recruit and retain faculty by demonstrating a commitment to and proper funding for research and creative activity**, including start-up funds and sustained funding.
- e. Pursue **proper infrastructure and space needs, technology/equipment availability**, and connection to student research opportunities.
- f. **Enrich graduate programs with competitive recruitment**, including competitive scholarships, research opportunities, and teaching experiences.
- g. Identify opportunities (system, state, federal, private, etc.) to **secure additional funding**.
- h. **Take the College's scholarly and creative activity into the community** in order to promote Chattanooga as a "teaching and learning lab" or studio.
- i. **Integrate sustainability** and its values—human interactions with and responsibilities to the natural environment—into both the Gen Ed and programmatic curricula.

Goal 5: The College of Arts and Sciences must establish its identity and value on campus, in the community, and beyond. The identity and value may be accomplished through improved communication, messaging, and marketing.

- a. Promote locally (*i.e.*, on campus) and regionally **achievements in teaching, learning, research, creative expression, and service of our faculty, staff, and students**. (ISP 2a)
- b. Improve **communication and engagement with our alumni and with partners/friends of the College** as a way to expand external support. (ISP 3b, 3f)
- c. Promote the College of Arts and Sciences as UTC's **locus for a rich and rigorous General Education curriculum**.

ASSESSING THE PLAN AND OUR GOALS

In the following tables, we align our goals and subgoals with measures of success over the next five years. We use academic year 2015-16 as a baseline, then articulate as best as possible what we aim to accomplish during/by years three (academic year 2017-18) and five (academic year 2019-20). Intermittent years (2016-17 and 2018-19) will be used to evaluate the previous year, plan for subsequent year, and reevaluate the strategic plan.

Goal 1: This College leads the university, community, and region in providing an essential liberal arts and sciences education that prepares students for an increasingly global context and economy.

Activity	Baseline 2015-16	Measure of Success for 2017-18	Measure of Success for 2019-20	Responsible Group or Individual	Definition, Source or Notes
Goal 1a: Promote a liberal education and broadly communicate the value of such an educational experience. (ISP 1g)	Identify ways to communicate the value of a liberal arts and sciences education, in addition to the role of the College is providing that education.	Create or broaden our communication strategies/messages across numerous media, e.g., CAS newsletter for alumni and community partners, videos, and more.	Assess promotional materials and their effectiveness.	Departments, Director of Community Partnerships; in partnership with the Honors College Development (magazine) and University Relations (help with website and social media)	These programs are already happening, just need to be more consistently promoted by the college
Goal 1b: Actively recruit and retain undergraduate and graduate students; increase degree completion rates . (ISP 3a)	Inventory of college-level data and strategies, including department and program retention data and graduation rates. Create or refine department retention plans. Determine appropriate goals, e.g., exceed institutional retention and degree completion averages.	Identify and implement best practices to improve retention data and graduation rates by department/program/discipline as a way to determine our own best practices. Implement strategies to build a culture around our students (supporting student clubs, student research conferences, etc.)	Assess best practices or strategies to improve retention data and graduation rates across the College. Assess student support structures at the department and college levels.	OPEIR, Dean's office, department heads, faculty, staff, professional and faculty advisors, NSSE and FSSE data will help us determine <i>what</i> is successful. (The challenge will be to determine <i>why</i> .) In partnership with the Honors College Student Development	More specifically, we may build a more robust advisement program, improve advisement training, improve advisement from freshmen to sophomore years as students transition from CASS advisors to professional or faculty advisors in their major. A significant challenge in the short term will involve students who come in with 2 years of

		Consider creation of "Student Mentors" or "CAS Ambassadors" or leadership certificate.			technical or community college course work (associate degrees). We will need to reconsider alignment of faculty, impact on programs, impact on SCH as measure for productivity.
Goal 1c: Mindfully integrate up-to- date technology and sustain best teaching practices to provide students in the College with the best possible 21 st century classroom and learning experience. This includes increasing the accessibility and modality of courses that make up the General Education curriculum. (ISP Goal 1)	Inventory of classes offered online or as hybrid. Facilitate discussions at the department level regarding the scholarship of teaching and learning. Determine level of participation by faculty in Walker Center for Teaching and Learning activities or other (perhaps discipline-specific) professional development activities in teaching.	Assess demand for online and/or hybrid courses. Adjust course offerings as necessary. Departments revise bylaws as they deem necessary. Assess effectiveness of professional development activities related to teaching. Increase participation by faculty, as may be needed, in such training or in Instructional Excellence retreats.	Evaluate retention and degree completion rates of online and hybrid courses. Departments revise bylaws as they deem necessary. Assess effectiveness of professional development activities related to teaching. Increase participation by faculty, as may be needed, in such training or in Instructional Excellence retreats.	Dean's office, department heads, faculty, staff	Annual performance evaluation may be tied to a faculty member's ability to or willingness to remain engaged in the practice of good teaching.
Goal 1d: Expand points of contact, outreach communication, and opportunities for engagement and relationship building with UTC	Identify ways in which we currently communicate with alumni and/or	Establish clear lines of communication with alumni and/or community partners, friends, and	Evaluate effectiveness of outreach communication and make necessary improvements.	Dean's office, University Relations, Development, and Alumni Affairs, PEG	Goals for increases in respective areas are designed to mirror similar goals in place

graduates and other key constituents of the College to facilitate external support. (ISP Goal 3)	community partners, friends, and supporters of the College. Promote public events, e.g., Patten Performances.	supporters of the College, e.g., College Newsletter, use of social media, alumni associations by department.		Alumni Attitude Survey (THEC)	for the UT System and used in the Office of Development and Alumni Affairs, which in turn are based on industry standards.
Goal 1e (and 3c): Increase opportunities for UTC students, faculty, and staff to have an international or study abroad experience to ensure first-hand exposure to global examples of cultural, architectural, intellectual and scientific achievement. (ISP 4c)	Collaborate with the Office of International and National Exchange Programs to promote study abroad and to determine the number of faculty, staff, and students who participate in national and international exchange.	Determine the available programs for students. Consider feasibility of expanding programs as well as opportunities for faculty support. Continue to promote international and study abroad experience by participating in campus-wide fairs and activities. Identify funding/support opportunities for international and/or study abroad experience. Participate in “International/Study Abroad Day” so that UTC faculty and students can publicly share their travel-abroad experiences and recruit interested students.	Increase faculty, staff, and student participation by 100%.	Office for International and National Exchange Programs, <i>ad hoc</i> Committee on International Programs, Dean's Office, faculty, staff, and students. In partnership with the Honors College	https://www.insidehighered.com/views/2015/03/23/essay-problems-american-ignorance-world

Goal 2: The College of Arts and Sciences values and promotes human achievement in the social sciences, behavioral sciences, natural sciences, humanities, and fine arts.

Activity	Baseline 2015-16	Measure of Success for 2017-18	Measure of Success for 2019-20	Responsible Group or Individual	Definition, Source or Notes
Goal 2a Provide undergraduate and graduate programs that offer a framework for personal and professional growth and that expose students to the scope and range of human achievement in the arts and sciences. (ISP 1c, 1g).	Departmental review of undergraduate and graduate degree programs, including course offerings, to develop and refine program student learning outcomes (SLOs). Identify areas of potential program growth, particularly interdisciplinary programs. Initiate method to evaluate these programs and their potentials.	Initial assessment of program SLOs. Review and update Clear Path "showcases" and academic scheduling to ensure course offerings are of sufficient frequency and variety to enable students to complete degree requirements. Use course predictive models. Evaluate Gender Studies, African Studies, etc. Modify curriculum and/or programs as needed.	Implement necessary changes to program SLOs, including ClearPath Showcases, to promote intellectual exploration, retention and timely graduation. Continue to hone and refine undergraduate and graduate student curriculum.	OPEIR, department heads, program directors and coordinators	
Goal 2b: Provide instruction and enable student learning through innovative teaching strategies , including flipped classrooms, team-based learning, problem-based learning, facilitations and presentations, online and hybrid	Identify teaching strategies and resources for faculty to effectively deliver instruction.	Support, encourage, and recognize faculty in the development of innovative and flexible teaching strategies to increase faculty effectiveness in the classroom. Communicate	Continue to encourage, support, and recognize faculty teaching innovations. Continue to seek out appropriate instructional technologies.	Dean's office, department heads, Information Technology, Walker Center for Teaching and Learning, Library Instructional	

instructional delivery. (ISP 1d, 2d)		need for and maintain state-of-the-art technology in labs and classroom spaces.		Resources. In partnership with the Honors College	
Goal 2c: Increase student participation in research and creative activities under faculty guidance.	Identify areas of research available to students and actively promote faculty-supervised research projects. Identify resources available to support and fund faculty/student research.	Assess the number of faculty and students who are working collaboratively on research or creative projects. Provide support for qualifying students to defray the cost of conducting/presenting research and creative activities under faculty guidance. Determine appropriate support for faculty who engage in research with students. Consider, for example, offering course credit, funding student-assisted faculty research, or offering a course release to faculty members who have directed DHON projects and/or graduate theses in the previous five years.	Continue to encourage faculty/student research collaboration Identify the number of students qualifying and receiving funding for research and creative activities	Dean's office and department heads. In partnership with the Honors College. Office for Undergraduate Research and Creative Activity.	

Goal 2d: Showcase and reward faculty/student research and creative achievement through department- and college-level awards, grant funding, reassigned time, and more. (ISP 3h)	Identify what departments currently do to showcase and reward faculty/student research and creative achievement. Determine funding opportunities (internal and external) that support faculty/student research and creative activities.	At least half of the departments within CAS will have the means by which to showcase student/faculty research and creative projects. Award a College prize for most outstanding DHON thesis and Graduate thesis in the Arts and Sciences. Install a highly visible display case on campus (Library, UC, etc.) to celebrate CAS faculty and student research and creative activities.	Evaluate use of social media as a way to showcase research and creative activities. Explore additional opportunities to expand scope of promotion. Expand the awards process for outstanding student research. (If promotion if working, we should see increased support.) Continue to maintain research and creative activities display case.	Dean's office, department heads. In partnership with the Honors College. Office for Undergraduate Research and Creative Activity	It is imperative that we acknowledge the contributions of our contingent faculty. These colleagues teach, research, create, and serve in numerous ways across the College. We must consider increased financial support, and we must identify adequate and proper work space for our contingent faculty.
Goal 2e: Participate in and/or sponsor campus and community activities that promote cultural engagement and highlight achievements in the social sciences, natural sciences, humanities, and fine arts.	Document previous faculty and student community-based activities.	Host a minimum of one colloquium per semester for campus and wider community in an attempt to highlight research and creative activities of faculty and students. Promote engagement in university research colloquia (i.e. UTC's Research Day).	Evaluate success of colloquia. Increase the number of participants in research engagement activities—i.e., students and community partners.	Dean's Office, CAS Department Heads and Graduate Coordinators, Development Office, Office for Undergraduate Research and Creative Activity, Office of Partnerships and Sponsored Programs. In partnership with Honors College.	Consider hosting guest scholars as well; requires adequate funding for guest lectures.

Goal 3: The College of Arts and Sciences embraces cultural and intellectual diversity.

Activity	Baseline 2015-16	Measure of Success for 2017-18	Measure of Success for 2019-20	Responsible Group or Individual	Definition, Source or Notes
Goal 3a: Participate in the implementation of an institutional diversity plan by creating a college-level diversity plan which defines and sets clear metrics for diversity of faculty, staff, and students. (ISP 4A, 4D)	Assemble a college-level Diversity Board. Review ISP diversity plan and determine areas that should be addressed and implemented. Develop 5-year hiring plan. Develop plan to recruit minority and under represented minority students to our majors.	Review metrics identified in the University diversity plan and prepare college-level draft of our own diversity plan. Review 5-year hiring plan. Review plan to recruit minority and under represented minority students to our majors.	Complete and implement CAS diversity plan, which supports the University plan. Assess 5-year hiring plan. Assess recruitment of minority and under represented minority students in our majors.	Dean's office, CAS Diversity Board, department heads, faculty, staff and students. Collaborate with Rosite George and Multicultural Center.	
Goal 3b: Advocate for a culture of inclusion , including physical and technological access for students, faculty and staff with disabilities. (ISP 4b)	With the assistance of DRC, determine level of access for students, faculty and staff. Develop an outline that will highlight areas of improvement.	Coordinate with DRC and the ATI (Accessible Technology Initiative) Committee to assist in the completion of 50% of improvements.	Maintain membership on and support the ATI Committee as a way to ensure that the College keeps as a top priority a culture of inclusion within this unit.	Dean's office, department heads, members of the ATI Committee.	http://www.utc.edu/diversity-resource-center/ http://www.utc.edu/academic-affairs/accessible-technology-initiative/
Goal 3c: Increase opportunities for UTC students, faculty, and staff to have an international or study abroad experience to ensure first-hand exposure to global examples of cultural, architectural, intellectual and scientific achievement. (ISP 4c)	Collaborate with the Office of International and National Exchange Programs to promote study abroad and to determine the number of faculty, staff, and students who participate in national and international exchange.	Determine the available programs for students. Consider feasibility of expanding programs as well as opportunities for faculty support. Continue to promote international and study abroad experience by participating in campus-wide fairs and activities. Identify funding/support	Increase faculty, staff, and student participation by 100%.	Office for International and National Exchange Programs, <i>ad hoc</i> Committee on International Programs, Dean's Office, faculty, staff, and students. In partnerships with the Honors College.	https://www.insidehighered.com/views/2015/03/23/essay-problems-american-ignorance-world

		opportunities for international and/or study abroad experience. Participate in “International/Study Abroad Day” so that UTC faculty and students can publicly share their travel-abroad experiences and recruit interested students.			
Goal 3d: Offer educational opportunities that promote an awareness of and an appreciation of divergent worldviews.	Identify existing opportunities and programs that facilitate awareness and appreciation of divergent worldviews. Consider colloquium series—internal and external speakers/lectures.	Review opportunities and programs that facilitate awareness and appreciation of diverse perspectives and experiences, particularly in the General Education curriculum (nonwestern cultures category) and in Patten Performances.	Revise and update as necessary programs and curriculum that support this goal.	General Education Committee, College Curriculum Committee, department heads and faculty. In partnerships with the Honors College.	http://www.utc.edu/fine-arts-center/pattenperformances/index.php
Goal 3e: Showcase and promote multidisciplinary and interdisciplinary research, teaching, and creative activities.	Identify interdisciplinary research, teaching, and creative activities. Evaluate the current interdisciplinary programs to define their impact.	Explore a broader focus and broader appeal for our current interdisciplinary programs and minors.	Revise as necessary our interdisciplinary programs and minors. Build enrollment in these majors and minors.	Dean's office, department heads. In partnerships with the Honors College.	http://catalog.utc.edu/preview_entity.php?catalogid=14&ent_oid=535&returnto=430; Consider cluster hires and cluster areas.

Goal 4: The College of Arts and Sciences cultivates new knowledge through research (theoretical and applied) and creative activities that engage students, faculty, and community partners.

Activity	Baseline 2015-16	Measure of Success for 2017-18	Measure of Success for 2019-20	Responsible Group or Individual	Definition, Source or Notes
Goal 4a: Increase student involvement in experiential learning, research, creative endeavors, internships, senior capstone projects, practica, and service. (ISP Goal 1)	Identify programs (majors and minors) that provide such opportunities. Identify number of students who participate in such opportunities. Identify current courses that could be designated as “Beyond the Classroom” courses as they already exist.	Implement plan derived from baseline assessment to increase baseline by 10%, if funding is available and faculty workload has been adjusted to accommodate supervision of these activities. That is, work toward establishing appropriate support (<i>e.g.</i>, college-level or department-level internship coordinator positions) to facilitate stronger and more opportunities for research, internships, service learning, and creative endeavors with community partners. Work with Beyond the Classroom designation to allow students credit on their diploma and transcripts.	Implement plan to reach goal that will be set based on assessment from previous cycle. This will involve evaluating (relative to SLOs) and improving as needed opportunities for community-engaged research, internships, service learning, and creative endeavors.	Deans office, Department heads. WCTL staff/faculty, Office of Undergraduate Research and Creative Activity (Sal), ThinkAchieve, Experiential Learning Coordinator (Bengt). Student Development. Career Services.	

Goal 4b: Promote greater student engagement in research and creative activity, including the presentation of student/faculty work in scholarly and creative outlets. (ISP Goal 1b, 2a)	Identify level of student/faculty participation in research and creative activity, in addition to available funds and travel support. Identify ways in which departments recognize or otherwise support faculty participation in student research. Initiate conversation with Honors College regarding student participation, student supervision, and faculty compensation.	Implement plan derived from baseline assessment to increase baseline by 10%, if funding is available and faculty workload has been adjusted to accommodate supervision of these activities. Offer additional opportunities for Provost Student Research Award (PSRA) grants, as funding is available. Further encourage faculty and students to present their scholarly work at UTC Research day, or attend the event if not presenting.	Implement plan to reach goal that will be set based on assessment from previous cycle. Develop awards/honorary distinction for independent student research and creative activity.	Provost, Dean's office, Department Heads, Office of Partnerships and Sponsored Programs, Office of Undergraduate Research and Creative Activity, Honors College, Vice Chancellor for Research and Dean of the Graduate School	
Goal 4c: Pursue faculty workload that is consistent with experiential learning objectives. (ISP 4a, 4b)	Develop a college-level plan/policy that incorporates supervision of student scholarly experiential learning into faculty workload. Research peer institutions and their policies on aligning faculty workload with experiential learning opportunities and investments.	Draft policy.	Review and revise faculty workload policy relative to investment in experiential learning.	Provost, Deans, Department Heads, Office of Undergraduate Research, and Faculty Workload Committee, OPEIR, Honors College	

Goal 4d: Recruit and retain faculty by demonstrating a commitment to and proper funding for research and creative activity , including start-up funds and sustained funding.	Assess faculty hiring packages relative to peer institutions in the last two years. Assess funds allocated to faculty for research and/or creative activity relative to peer institutions in the last two years. Assess current faculty retention rates. Assess discipline, regional and national standards for faculty compensation of scholarly work.	Implement plan derived from baseline assessment to ensure competitive and proper funding for research and creative activity.	Assess plan derived from baseline assessment to ensure competitive and proper funding for research and creative activity.	Dean's office, department heads, OPEIR	Sabbatical policy: http://www.utc.edu/faculty-senate/pdfs/ch7handbook.pdf
Goal 4e: Pursue proper infrastructure, instructional space, technology, and equipment to support teaching, learning, and research.	Assess current allotment of resources, including space, technology, and equipment. Assess peer institutions' policies on allotment of resources. Assess standards set by accrediting bodies and/or discipline-specific standards.	Allocate available space, technology, and/or equipment to meet needs and standards established in baseline assessment.	Continue to address unmet needs with available resources.	Department Heads, faculty, Office of Undergraduate Research and Creative Activity, Vice Chancellor for Research and Dean of the Graduate School	
Goal 4f: Enrich graduate programs with competitive recruitment ,	Review graduate programs to determine	Increase support where needed to make our	Assess the success of recruitment packages,	Deans, department heads, Vice Chancellor	In Spring 2015 there were 312 students

including competitive scholarships, assistantships, research opportunities, and teaching experiences.	recruiting goals and funding opportunities. Assess current level of conference travel support for graduate students. Compare such support with peer institutions.	programs competitive with peer institutions.	levels of support, and adjust accordingly.	for Research and Dean of the Graduate School, Graduate Council	enrolled in CAS graduate programs and 37 full GA's offered, which means 11.9% of students received full GA's (some were split leading to 14.8% of students receiving at least partial support).
Goal 4g: Identify opportunities (system, state, federal, private, etc.) to secure additional funding .	Assess CAS funding success over past 5 years. Assess rates of funding at peer institutions and their colleges. Assess university policy for incentivizing and/or accommodating faculty/staff who seek extramural funding.	Implement plan to reach goal that will be set based on assessment from previous cycle. Implement policy to support and reward faculty/staff who pursue and receive extramural funding.	Implement plan to reach goal that will be set based on assessment from previous cycle.	Dean's office, department heads, Office of Partnerships and Sponsored Programs (OPSP), OPEIR	
Goal 4h: Take the College's scholarly and creative activity into the community in order to promote Chattanooga as a "teaching and learning lab" or studio.	Identify number of students/faculty working with community partners. Assess number of local internships. Collect data regarding audience attendance at performances or exhibits.	Implement plan derived from baseline assessment to increase baseline by 10%, if funding is available and faculty workload has been adjusted to accommodate supervision of these activities. Further encourage faculty to create collaborative opportunities for students and community members.	Implement plan to reach goal that will be set based on assessment from previous cycle. Develop awards/honorary distinction for off campus activities. Assess community engagement with lab and studio activity.	Dean's office, department heads, OPSP, Office of Undergraduate Research and Creative Activity, University Relations	

		Clearly communicate activities to community.			
Goal 4i: Integrate sustainability and its values—human interactions with and responsibilities to the natural environment—into both the Gen Ed and programmatic curricula.	We teach a number of courses that focus on issues related to the natural environment and sustainability; however, we do not have a comprehensive list of those courses, so there is no clearly defined curriculum surrounding environmental and/or sustainability issues. Survey departments to identify these courses.	Evaluate courses and consider developing an interdisciplinary minor or major in Environmental Studies or Sustainability Studies. Build a "teaching garden" that is useful in numerous courses across numerous departments and that is maintained by graduate and undergraduate students.	Established "teaching garden." Establish a college-level Sustainability Committee.	University's Sustainability Committee and various academic departments.	Chattanooga prides itself on being a city for outdoor enthusiasts and green initiatives. The College could become a player in solidifying the city's identity as such. This connects, too, with marketing and community partnerships.

Goal 5: The College of Arts and Sciences must establish its identity and value on campus, in the community, and beyond.

Activity	Baseline 2015-16	Measure of Success for 2017-18	Measure of Success for 2019-20	Responsible Group or Individual	Definition, Source or Notes
Goal 5a: Promote locally (i.e., on campus) and regionally achievements in teaching, learning, research, creative expression, and service of our faculty, staff, and students. (ISP Goal 2a)	Identify materials and media already in use to promote the College, its programs and academic departments. (For example, we have no annual newsletter.)	Expand materials that promote the College, e.g., videos that will be featured on the Dean's website and/or at sports events, billboard, etc. Begin to establish a CAS brand. Establish e-news letter.	Assess success of promotional materials and branding. Alumni feature videos.	Dean's office, Department Heads, faculty and staff. In partnerships with the Honors College.	Seek funding to support. Heads: provide examples of courses to advertise. Promote as a part of this sub goal our majors and careers for majors.
Goal 5b: Improve communication and engagement with our alumni and with partners/friends of the College as a way to expand external support. (ISP Goal 3b, 3f)	Gather information from Development office (Paul Clark) regarding alumni and local supports.	Brand CAS and its mission, vision, value to the community. Establish e-news letter. Host events for alumni to cultivate supporters and mentors.	Increase external support for programs by 10%.	Dean's office, Department Heads, Development Office, Alumni Office	Identify successes; identify areas to showcase
Goal 5c: Promote the College of Arts and Sciences as UTC's locus for a rich and rigorous General Education curriculum.	Consider rebranding General Education to emphasize its connection to liberal education. Review "General Education" brand at peer and aspirational peer Colleges of Arts and Sciences.	Increase visibility and purpose of General Education and its place in the College and across the campus. Continue to hone and refine "new" General Education—i.e., learning outcomes, etc.—from 2014.	Assess General Education marketing and communication, particularly its role in providing "fundamental knowledge, abilities, and aesthetic sensibilities, leading to more enriched lives and a more comprehensive view of our global world" (from our Gen Ed website).	Dean's Office, Department Heads, University General Education Committee. In partnerships with the Honors College.	Funding and university support needed; must involve faculty – support; AAC&U GEMS and Value Rubrics will be helpful here. https://www.aacu.org/value/rubrics http://www.utc.edu/general-education/

RESOURCES

The AAC&U's Statement on 21st Century Liberal Education

Council of Colleges of Arts & Sciences' "Statement on Liberal Education" (PDF)

Liberal Education America's Promise (LEAP) "AAC&U's 2015 Centennial Video"

Just What Are the Liberal Arts Anyway? **(Posted: 07/20/2015)**

http://www.huffingtonpost.com/cecilia-gaposchkin/just-what-are-the-liberal_b_7829118.html

Cited in the above video: Hart Research Associates' "Falling Short? College Learning and Career Success Selected Findings from Online Surveys of Employers and College Students" (January 2015) (PDF)

"Liberal Arts Training Pays Lifelong Benefits - Even for Doctors" Education Advisory Board (EAB). 5 June 2015. Original/Referenced article:

<http://www.npr.org/sections/health-shots/2015/05/27/407967899/a-top-medical-school-revamps-requirements-to-lure-english-majors>

That 'Useless' Liberal Arts Degree Has Become Tech's Hottest Ticket

<http://www.forbes.com/sites/georgeanders/2015/07/29/liberal-arts-degree-tech/>

University of Tennessee System Statement on Diversity

Appendix 2-A B.S. Geology scheduling matrix

Concentration		Fall 2023	Spring 2024	Fall 2024	Spring 2025	Fall 2025	Spring 2026	Fall 2026	Spring 2027	Fall 2027	Spring 2028	Fall 2028	Spring 2029	Fall 2029	Spring 2030	Fall 2030	Spring 2031	Fall 2031	Spring 2032	Fall 2032	Spring 2033
Intro course with lab	Core	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Historical Geol and lab	Core	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
GEOL 2100 (Intro GIS)	Core	x		x		x		x		x		x		x		x		x		x	
GEOL 3070 (Geo TN)	STEM			x				x				x				x				x	
GEOL 3220 (Soils)	Env/Arch								x				x				x				x
GEOL 3230 (Env Geo)	Env			x				x				x				x				x	
GEOL 3410 (Min)	Core	x		x		x		x		x		x		x		x		x		x	
GEOL 3420 (Petro)	Geo		x		x		x		x		x		x		x		x		x		x
GEOL 3530 (Paleo)	Elect	x				x				x				x				x			
GEOL 3540 (SedStrat)	Core		x				x				x				x				x		
GEOL 4070 (Dyn E)	Geo	x				x				x				x				x			
GEOL 4080 (ESP)	Core		x				x				x				x				x		
GEOL 4450 (Hydro)	Env/GspO/Hydro	x		x		x		x		x		x		x		x		x		x	
GEOL 4470 (Env Geochem)	Hydro		x				x				x				x				x		
GEOL 4490 (Hydro Mod)	Hydro/GspO				x				x				x				x				x
GEOL 4510 (Structure)	Core			x				x				x				x				x	
GEOL 4520 (Field Meth)	Geo				x				x				x				x				x
GEOL 4530 (GIS)	GSp				x				x				x				x				x
GEOL 4550 (RS)	GSp						x				x				x				x		
GEOL 4800 (Res Des)	Core	x		x		x		x		x		x		x		x		x		x	
GEOL 4900 (Sr. Res)	Core		x		x		x		x		x		x		x		x		x		x
GEOL 4960r (Field Exp)	Elect		x		x		x		x		x		x		x		x		x		x
ESC 4070 (Env. Cons)	Env	x		x		x		x		x		x		x		x		x		x	
ANTH 1400 (Archaeology)	Arch	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
ANTH 3350r (Arch Field Meth)	Arch	x		x		x		x		x		x		x		x		x		x	

(Core) Required Courses;(Geo) Geo:Geo; (Env) Geo:Env; (Arch) Geo: Geoarchaeology; (Gsp) Geo: Geospatial; (GspO) Option for Geo: Geospatial; (Hydro) Geo: Hydrogeology; (STEM) Geo: STEM; (Elect) Geology Elective

Course needing prerequisites

For CHEM 1110/L
For ESC 1500
For PHYS 1030
For PHYS 2300
MATH 1730
MATH 1950
ENGL 2810 (Tech Writing)
ENGL 2820 (Sci Writing)
GEOL 3070 (Geol of TN)
GEOL 3220 (Soils)
GEOL 3230 (Env Geol)
GEOL 3410 (Mineralogy)
GEOL 3420 (Petrology)
GEOL 3530 (Paleo)
GEOL 3540 (SedStrat)
GEOL 4070 (Dyn Earth)
GEOL 4080 (ESP)
GEOL 4450 (Hydro)
GEOL 4470 (App. Env. Geochem)
GEOL 4490 (Hydro Model)
GEOL 4510 (Structure)
GEOL 4520 (Field Meth)
GEOL 4530 (GIS)
GEOL 4550 (RS)
GEOL 4800 (Res. Design)
GEOL 4960r (Field Exp)
ANTH 3350r (Anth. Field Meth)
ESC 4070 (Env. Cons)

Prerequs needed:

MATH 1130 or MATH 1710 with min grade C or MATH ACT of 21 or above
MATH 1106 or MATH 1130 or MATH 1710 or MATH 1720 or MATH 1830 with min grade of C or MATH ACT of 22 or above.
MATH 1720 or MATH 1730 or MATH 1799 or MATH 1830 with min grade of B or MATH 1950 or a score of 28 or higher on MATH ACT
Pre- or Co: MATH 1950 with min grade of C.
MATH 1130 with min grade C or MATH ACT score of 24 or higher
MATH 1720 or MATH 1730 with min grade of C or MATH ACT of 28 or higher
ENGL 1020 with min grade of C
ENGL 1020 with min grade of C
Prev. GEOL course
Prev. GEOL course or ESC 1500 and CHEM 1110/L
Prev. GEOL course and CHEM 1110/L or CHEM 1050
Prev. GEOL course. Pre or Co: CHEM 1110/L
GEOL 3410 min grade C
GEOL 1120/L min grade C
GEOL 3410
Prev. Geol course.
Prev. GEOL course or ESC 1500
GEOL 1110/L and CHEM 1110/L or ENCE 3610
GEOL 4450
GEOL 4450
GEOL 3410
GEOL 4510
GEOL 2100
GEOL 2100
ENGL 2810 or 2820 and GEOL 3410
Prev. GEOL course
Dept head approval
none

Appendix 4-A

**University of Tennessee at Chattanooga
Faculty Handbook**

Preface

FACULTY HANDBOOK

The administration and faculty of the University of Tennessee at Chattanooga ("UTC") share responsibility for effectively conducting the academic affairs of UTC. Institutional success depends upon the mutual respect and thoughtfulness of the faculty and the UTC administration. Both the faculty and the UTC administration are employed by The University of Tennessee (the "University") and have specific responsibilities that can be successfully discharged only with the support and counsel of the other. UTC faculty members are professionals whose services have been obtained by the University through its administrators on behalf of UTC and for the sake of UTC's students.

The Faculty Handbook is intended to be a general summary of university governance, policies, guidelines, services, and resources. UTC maintains a copy of the current Faculty Handbook on the [Faculty Senate website](#). The Faculty Handbook, along with [UT Policy HR0580 - Code of Conduct](#), should be read carefully by all members of the faculty.

Collegiate and departmental bylaws do not supersede and may not conflict with the contents of this Faculty Handbook. In the event of any conflict or inconsistency between Board policy and this Faculty Handbook, Board policy will take precedence.

Current versions of the Board and UT System policies are available on the [UT System policy website](#).

UTC campus policies and procedures are available on the [UTC policy website](#).

Additional information about UTC accreditation, memberships, history, facts, and statistics may be found on the UTC website [here](#).

Chapter 1

University Organization and Governance

1.1. THE UNIVERSITY OF TENNESSEE SYSTEM

The University of Tennessee is the state's land-grant, higher education institution and flagship public university. It is comprised of campuses at Knoxville, Chattanooga, and Martin; the Health Science Center at Memphis; the Space Institute at Tullahoma; and the statewide Institute of Agriculture and Institute for Public Service.

The University of Tennessee System has a presence in each of Tennessee's 95 counties. Through the combined force of its education, research, and outreach, the University serves students, business and industry, schools, governments, organizations, and citizens throughout the state. The mission statement of The University of Tennessee System can be found [here](#).

1.2. THE UNIVERSITY OF TENNESSEE AT CHATTANOOGA

Since its founding as Chattanooga University in 1886, The University of Tennessee at Chattanooga ("UTC") has developed an institutional excellence which rests on an unusual blend of the private and public traditions of American education.

For 83 years the university was a private school. Three years after its founding, the university was consolidated with another church-affiliated school, East Tennessee Wesleyan University at Athens, under the name of Grant University. In 1907, the university adopted the name University of Chattanooga.

In 1969, the University of Chattanooga and a junior college, Chattanooga City College, merged with The University of Tennessee to form The University of Tennessee at Chattanooga campus.

UTC is a driving force for achieving excellence by actively engaging students, faculty and staff; embracing diversity and inclusion; inspiring positive change; and enriching and sustaining our community. The mission statement of UTC can be found [here](#).

1.3. UNIVERSITY ORGANIZATION AND GOVERNANCE

1.3.1. UT Board of Trustees (link: [Board of Trustees website](#))

The governing body of The University of Tennessee is the Board of Trustees (the "Board"). The Board exercises general control and oversight of The University of Tennessee System and its institutions, delegating to the President the executive management and administrative authority necessary and appropriate for the efficient administration of the system or to carry out the mission of the system; and delegating to each Chancellor the executive management and administrative authority necessary and appropriate for the efficient administration of each institution and its programs, subject to the general supervision of the President.

The Board reserves to itself, among other matters, the authority to approve the scope of educational opportunities to be offered by the University, provided that the planning and development of curricula shall be the function of the faculties; policies and procedures governing the granting and removal of tenure for faculty members; granting tenure to eligible members of the faculty upon the positive recommendation of the President; and general admission, progression, retention, and graduation requirements.

The Board, through its Academic Affairs and Student Success Committee, oversees matters related to the University's educational mission of teaching, research, and service; and considers the needs and interests of the faculty, administrative staff, and students in creating and sustaining the University's academic environment, including in the creation, evaluation, continuation, and termination of academic programs.

For a more complete description of the organization, duties, and powers of the Board, please consult the Charter of The University of Tennessee and the [Board Bylaws](#).

1.3.2. UT System Administration

The UT System Administration, headed by the President, enunciates the general mission of The University of Tennessee System, and coordinates comprehensive, long- range plans, growth, and development of the campuses and system operating divisions. For more information regarding the organization, duties, and functions of the UT System Administration, please consult the [Office of President website](#).

1.3.3. UTC Campus Administration

The Chancellor of the UTC campus (the "Chancellor") has been delegated authority to administer the campus, subject to the supervision of the President and to system-wide administrative policies, and to coordinate campus relations with the officers of the UT System Administration. For the UTC campus, the Chancellor exercises primary authority in control and allocation of all fiscal resources; establishment of the administrative organization; approval of personnel appointments; administration of academic programs and policies; administration of student affairs and services; administration and control of the intercollegiate athletics program; and administration of all campus plans and facilities. As a member of the President's staff, the Chancellor also participates regularly in matters concerning the state-wide University of Tennessee System. The Chancellor serves at the pleasure of the President.

For more information regarding the organization, duties, and functions of the Office of the Chancellor and the UTC campus administration, please consult the [Office of the Chancellor website](#) and [Article IV, Section 5\(c\) of the Board Bylaws](#).

1.3.4. UTC Academic Administration

1. Provost and Vice Chancellor for Academic Affairs

The Provost and Vice Chancellor for Academic Affairs (the "Provost") is the chief academic officer of UTC. The Provost reports directly to the Chancellor and is responsible for the supervision of all academic affairs at UTC, including ensuring that UTC's academic programs and faculty are of the highest quality. The Provost's responsibilities include, but are not limited to, working collaboratively with the deans for the oversight of the colleges and similar major academic units; supervising and evaluating the performance of the deans and Academic Affairs administrators and staff; managing the Academic Affairs budget and fiscal affairs; directing the development and implementation of UTC's academic plans and policies; working in a collaborative fashion with UTC administrators, the deans, and faculty to advance UTC's academic programs; and reviewing recommendations for appointment, salary, retention,

tenure, and/or promotion of faculty and making recommendations to the Chancellor regarding the same.

The Provost serves at the pleasure of the Chancellor. Information about the UTC Academic Affairs administrative structure can be found at the [UTC Academic Affairs webpage](#).

2. Academic Deans

Academic units at UTC are varied and diverse both in their role and scope and in their model of organization. Each college or major unit (hereafter referred to as "college") is administered by a dean, who is the chief officer responsible for the success of its programs.

Deans serve as the academic leaders of their colleges, representatives of their colleges to the rest of the UTC community, representatives of the UTC executive leadership to their colleges, managers of the resources of their colleges, and representatives of their colleges and UTC to external bodies. A dean's responsibilities include, but are not limited to, coordinating the development of and implementing the college's goals in alignment with UTC's goals and strategic plan; developing a college budget through conversation with department heads and faculty within the college; managing the fiscal affairs of the college; evaluating the performance of department heads and staff within the college; reviewing recommendations for appointment, salary, retention, tenure, and/or promotion of faculty within the college, and making recommendations regarding the same to the Provost; and assessing the performance of academic programs within the college and recommending to the Provost reductions in or the elimination of current programs and the addition of new programs within the college.

The deans serve at the pleasure of the Provost and the Chancellor. An evaluation of the performance of the deans is conducted annually by the Provost.

3. Academic Department Heads

The term "department head" includes administrators with other titles, such as director, who perform the duties of a unit administrator, where the basic administrative units are typically departments, but not always (e.g., schools). In discipline-specific colleges not organized into schools or departments, the dean may serve as both dean and department head.

The department head is the first level of administration and is assigned the special duty of administering the academic department. The department head is appointed by the dean in consultation with the faculty within the unit that the department head will administer.

The department head's responsibilities include, but are not limited to, assuming responsibility for the quality, effectiveness, and progress of the academic programs and activities within the department; implementing University, college, and departmental policies and procedures affecting the department, with due regard for the prerogatives and responsibilities of the faculty; recommending to the dean, after appropriate faculty counsel and consistent with University policies and procedures, appointment, re-appointment, salary adjustments, tenure, dismissal, and other personnel actions relating to members of the faculty and staff within the department; providing, through conversation with the departmental faculty, an annual budget for the department and submitting the annual budget to the dean; coordinating the recruitment of new faculty members within the department, consistent with University policies and procedures; promoting the career development and performing annual performance appraisal

reports of faculty and staff within the department; and in consultation with the departmental faculty, assessing departmental academic programs for performance and productivity and recommending to the dean the continuation, reduction, or elimination of programs and the addition of new programs within the department.

In addition, the department head's responsibility entails care of the apparatus necessary for support of the academic programs through employment and supervision of clerical and support personnel, management of departmental physical facilities, planning for space and equipment needs, and monitoring of all expenditures from the departmental budget.

The department head's many tasks relating to these duties may be delegated to other members of the department or to specific clerical or support personnel. In almost all departments, a number of standing faculty committees are responsible for collection of data and the formulation of policy recommendations concerning specific matters. In such instances, the departmental faculty reviews recommendations made by committees. The active participation of departmental faculty in the planning, execution and review of its curriculum is vital to the well-being of the department.

The administrative appointment of department heads, like all other administrative offices, does not carry tenure. The department head serves at the pleasure of the dean, Provost, and Chancellor. The dean conducts an annual evaluation of the department head.

1.4. UTC FACULTY ROLE IN SHARED GOVERNANCE

Faculty members are representatives of a profession whose services have been obtained by the University through its administrative officers on behalf of UTC and for the sake of UTC's students. The privileges and responsibilities of the faculty in the governance of UTC are important and varied. The most direct responsibility of the faculty in the governance of UTC is to plan and develop the curriculum of UTC's academic programs. The Board, through its Academic Affairs and Student Success Committee, shall consider the needs and interests of the faculty (as well as the administrative staff and students) in creating and sustaining UTC's academic environment, including the creation, evaluation, continuation, and termination of academic programs. A less direct, but no less important, role of the faculty is to advise UTC's administration about administrative matters that are intrinsically related to the well-being of UTC. These advisory matters include the:

- appointment, dismissal, evaluation, and reappointment of faculty, including probationary faculty
- promotion of faculty and the awarding of tenure
- evaluation of faculty performance
- grievances of faculty
- search for and hiring of the UTC Chancellor, Provost, deans, and department heads

The opinion of the faculty in these areas is invaluable. Its advice cannot be lightly given or peripherally received. Institutional success depends upon the mutual respect and sensitivity of the faculty and the administration. The basic principle of the relationship is that the faculty and the administration are colleagues in shared governance. The Board is the governing body for all campuses within the University of Tennessee System and has delegated respectively to the faculty and administration separate specific sets of responsibilities that can be successfully discharged only with the support and counsel of the other. It is the right and responsibility of faculty members to work collaboratively with administrators, professional support staff, and students in deliberations and decisions on university actions, policies, and positions on

the matters listed above. The basic fundamentals of successful shared governance include:

- transparency and accessibility of information and responses of others
- adequate time to reflect on information and the responses of others
- opportunity to communicate collaboratively across all campus bodies
- consistency in the process of shared governance
- clear accountability for responsibilities at all levels
- consistent and clear communication among all levels of governance

1.4.1. The Full Faculty

The full faculty is composed of all full-time tenured, tenure track and non-tenure track faculty.

The full faculty reviews, considers and votes on issues of major importance. Issues of major importance are determined by the Faculty Senate President, in consultation with the Faculty Secretary, the Senate Executive Committee, the Parliamentarian, and, whenever possible, the body of the Faculty Senate.

1.4.2. Faculty Senate

The faculty role in campus-wide governance is through its representative body, the Faculty Senate, and responsibility for much of the business conducted on behalf of the faculty is delegated to the Faculty Senate. The Faculty Senate is composed of elected faculty representatives as well as administrators with *ex officio* status. The Faculty Senate is authorized to recommend to the Chancellor for approval, policies and regulations related to the overall general requirements for admission, readmission, retention, graduation, and honors for the academic programs of UTC; and UTC's educational standards and degree requirements, including planning, development, and recommendation of academic programs and their curricula. The Faculty Senate is also authorized to consider, advise, and recommend to the administration policies about a wide range of issues affecting the general welfare of the faculty.

Neither the full faculty nor the Faculty Senate have management or administrative functions either in themselves or through their committees, since such functions are expressly reserved for the President (as delegated by the Board) and through the President to the Chancellor. Nevertheless, the advice and recommendation of the full faculty and the Faculty Senate about all of the matters listed in the previous paragraph are considered carefully and seriously by all administrators.

Specific information about the organization, duties, and powers of the Faculty Senate can be found in the [Faculty Senate Bylaws](#).

1.4.3. Faculty Role in Appointment of UTC Administrators

The Bylaws of the Board of Trustees provide that in a search to fill a vacancy in the UTC Chancellor position, the President's advisory committee shall include faculty, staff, students, alumni, and representatives of the external constituencies of the campus to assist in identifying and screening candidates. In addition, the UTC faculty and the Faculty Senate render advice to the UTC administration about the appointment of the Provost, deans, and department heads. In addition, the faculty of each academic unit plays an important role in the evaluation of deans and department heads assigned to it and in the search of new persons to fill such positions as they become vacant. When these leadership positions become vacant, faculty members are invited and expected to serve on search committees, to interview prospective candidates and to submit

evaluations of those candidates. This participation in the ongoing renewal of the leadership is one of the most important ways in which faculty judgment informs the administration of the University.

1.4.4. Faculty Role on Administrative Committees

Administrative committees play an important role in the governance of UTC. These committees, composed of students, faculty, staff and, in some cases, members of the community, are appointed yearly by the Chancellor and other administrators to assist in the development of institutional policy, procedure and practice. Faculty members are given an opportunity to indicate their preference of administrative committees on which they wish to serve.

Chapter 2

Faculty Rights and Responsibilities

2.1. ACADEMIC FREEDOM

The principal mission of the University is the discovery and dissemination of truth through teaching, research and service. The Board of Trustees for The University of Tennessee ("Board") recognizes that freedom of inquiry and expression is indispensable for this purpose and believes that it and the administration and faculty should cooperate to that end. In the University's program of teaching, research and service, it is essential that the Board, administration and faculty cooperate voluntarily, each contributing freely, according to his or her qualifications, in a mutually beneficial exchange of information and ideas.

2.1.1. Academic Freedom and Responsibility of the Faculty Member

The Board's policy governing academic freedom and responsibilities ([UT Policy BT0006](#)) states the following about academic freedom and the responsibility of faculty members:

A healthy tradition of academic freedom and tenure is essential to the proper functioning of a University. At the same time, membership in a society of scholars enjoins upon a faculty member certain obligations to colleagues, to the University, and to the State that guarantees academic freedom.

1. The primary responsibility of a faculty member is to use the freedom of his or her office in an honest, courageous, and persistent effort to search out and communicate the truth that lies in the area of his or her competence.
2. A faculty member is entitled to full freedom in research and in publication of the results, subject to the adequate performance of his or her other academic duties, but research for pecuniary gain either within or beyond the scope of his or her employment must be based upon an understanding with the University administration, according to the University's policies (e.g., Compensated Outside Services, Conflict of Interest).
3. A faculty member should maintain a high level of personal integrity and professional competence, as demonstrated in teaching, research, and service. Academic freedom does not exempt a faculty member from an evaluation by colleagues and administration of his or her qualifications for continued membership in their society.
4. Although faculty are free in the classroom to discuss subjects within areas of their competence, faculty shall be cautious in expressing personal views in the classroom and shall be careful not to introduce controversial matters that have no relationship to the subject taught, and especially matters in which they have no special competence or training and in which, therefore, the faculty's views cannot claim the authority accorded statements they make about subjects within areas of their competence; provided, that no faculty will face adverse employment action for classroom speech, unless it is unreasonably germane to the subject matter of the class as broadly construed, and comprises a substantial portion of classroom instruction.
5. A faculty member should recognize that the right of academic freedom is enjoyed by all members of

- the academic community. He or she should be prepared at all times to support actively the right of the individual to freedom of research and communication as defined herein.
6. In addition to the normal responsibilities of a citizen of the State and nation, including the duty to uphold their Constitutions and obey their laws, a faculty member also should conduct himself or herself professionally with colleagues. He or she should strive to maintain the mutual respect and confidence of his or her colleagues. He or she should endeavor to understand the customs, traditions, and usages of the academic community.
 7. When, as a citizen, a faculty member speaks outside the classroom or writes for publication, he or she should be free, as a citizen, to express his or her opinions. Each faculty member should conduct himself or herself professionally, should be accurate, should exercise appropriate restraint, should show respect for the opinions of others, and should make clear that he or she speaks for himself or herself and not for the University.
 8. This policy is intended to be consistent with [UT Policy BT0010 - Policy Affirming Principles of Free Speech for Students and Faculty](#), and shall be interpreted accordingly.

2.1.2. Academic Freedom and Responsibility of the University Administration

The Board's policy governing academic freedom and responsibilities ([UT Policy BT0006](#)) states the following about academic freedom and the responsibility of the University administration:

1. The University is committed to recruiting, appointing, retaining and promoting faculty members by processes which are thorough, thoughtful, equitable, and in which the professional judgments of faculty members are of major importance.
2. Administrative officers should actively foster within the University a climate favorable to freedom of teaching and research. In its pursuit of excellence, the University should reward its outstanding faculty members.
3. The administration is responsible for enforcing all Board and campus policies applicable to faculty members. It is the duty of the administration—beginning with department heads, deans, and chief academic officers—to remove from the faculty any faculty member who has been found, through proper procedures, seriously derelict in his or her responsibilities as a member of the academic community.

2.2. TENURE

Tenure is defined in board policy and protects academic freedom. This status is awarded to a junior tenure-track faculty member after serving a successful probationary period that is typically six years, to a senior faculty member with previously demonstrated academic excellence who maintains excellence for a shorter probationary period, to a senior faculty member of outstanding academic excellence who was tenured at the institution from which recruited, or to a senior faculty member who is assuming a senior administrative position at the time of appointment and was tenured at the institution from which recruited. Additional information about tenure is found in [Chapter 3](#) of this Handbook.

2.3. FREEDOM AS A CITIZEN

When faculty members communicate as citizens on matters of public concern, they operate independently of UTC. In this situation, faculty members have rights common to all citizens, including the rights to organize associations, join associations, participate in public meetings, run for and serve in government

offices subject to applicable state and federal laws and university personnel policies, demonstrate, picket, and voice their opinions. When exercising their rights as citizens, faculty members must also respect UTC by not claiming to represent the positions or views of UTC and by using institutional resources.

2.4. EQUITY AND DIVERSITY

2.4.1. Equal Employment Opportunity

1. Policy and Position Statements

The University is committed to the principle that decisions concerning employment, admission, and performance should be based on an individual's qualifications and performance and not on characteristics unrelated to job performance or academic requirements. It is the policy of the University under [UT Policy HR0220 - Equal Employment Opportunity](#) not to discriminate against any employee or applicant for employment on the basis of race, color, religion, sex, marital status, parental status, sexual orientation, gender identity, national origin, disability, age, genetic information, veteran status, or any other characteristic protected by federal or state law. The University policy also prohibits harassment based on such characteristics. This policy extends to recruitment, employment, promotion, demotion, transfer, layoff, termination, compensation, training, benefits, and all other terms and conditions of employment.

This policy shall not be construed to: (1) confer eligibility for employment benefits for which an employee is not otherwise eligible under state law, policy, or practice as the same may be modified by federal law; (2) infringe upon the free exchange of ideas essential to the academic environment; (3) limit freedom of religious association; (4) establish a duty to engage in affirmative action measures for characteristics not subject to affirmative action under state or federal law; (5) require the compliance of external government agencies in which non-discrimination does not include certain personal characteristics (e.g., ROTC); or (6) create any cause of action not currently provided under state or federal law.

For further information, see the following:

- [UTC Notice of Non-Discrimination and Statement of Equal Employment Opportunity](#)
- The UTC Office of Equity and Inclusion (OEI). The [OEI website](#) includes information regarding the following:
 - o Discrimination complaint procedures;
 - o The affirmative action checklist for conducting searches; and
 - o UTC sexual harassment and discrimination guidelines.

2. Complaints

Complaints that a University employee has violated a University policy prohibiting discrimination, including but not limited to [UT Policy HR0220 - Equal Employment Opportunity](#) and [UT Policy HR0280 - Sexual Harassment & Other Discriminatory Conduct](#), should be directed to the OEI. Complaints will be investigated and resolved in accordance with the [Discrimination Complaint Procedure](#).

2.4.2. Sex Discrimination

UTC is a recipient of federal financial assistance, and in accordance with the provisions of Title IX of the Education Amendments of 1972, 20 U.S.C. § 1681 *et seq.* ("Title IX"), all of its education programs and activities are subject to the prohibition against sex discrimination, including sexual harassment, sexual assault, and sexual exploitation. UTC's [Nondiscrimination Statement](#) prohibits sex discrimination in any UTC education program or activity, including employment and admissions. Title IX applies to all UTC students, employees, applicants for admission or employment, volunteers and campus visitors.

1. Sexual Harassment & Other Discriminatory Harassment

The University is committed to an environment that recognizes the worth and dignity of every person while striving to foster tolerance, sensitivity, and mutual respect. The University therefore prohibits employees from engaging in acts of harassment on the basis of sex, which includes harassment based on gender, pregnancy, sexual orientation, and gender identity, as required by state or federal law. [UT Policy HR0280 - Sexual Harassment & Other Discriminatory Conduct](#) prohibits employees from engaging in sexual or other discriminatory harassment, regardless of whether such conduct is directed at another employee, a student, a vendor, or a visitor to campus.

2. Policy on Sexual Harassment, Sexual Assault, Dating and Domestic Violence, and Stalking

UTC is committed to creating and maintaining a learning, living, and working environment free from sexual harassment, sexual assault, dating and domestic violence, stalking, and retaliation, as defined and prohibited under the [Policy on Sexual Harassment, Sexual Assault, Dating and Domestic Violence, and Stalking](#) ("Title IX Policy"). The Title IX Policy protects and applies to the conduct of UTC students, employees, volunteers, contractors, and third parties participating in a UTC program or activity.

(1) Complaints

Complaints of prohibited conduct under the Title IX Policy should be directed to the OEI or the Title IX Coordinator. Complaints will be investigated and resolved in accordance with the Title IX Policy.

(2) Mandatory Reporter Obligations

All UTC faculty members are mandatory reporters under the Title IX Policy when: (1) the complainant is a student; (2) the faculty member is the immediate supervisor of either the complainant or the respondent; or (3) the faculty member has the authority to redress the prohibited conduct. As mandatory reporters, faculty members are obligated to report information they receive concerning conduct prohibited under the Title IX Policy to the Title IX Coordinator in accordance with the mandatory reporter procedures set forth in the policy. A mandatory reporter's failure to fulfill his or her obligations may result in discipline. For more information regarding the requirements and guidelines for mandatory reporters, please see the [Title IX Policy](#).

3. Prohibited Relationships with Students

An amorous or sexual relationship between a faculty member and a student greatly increases the potential for a faculty member's abuse of power because of the inherently unequal status of the persons involved in the relationship. Even in cases where such a relationship begins with the mutual consent of the participating persons, it can result in exploitation of the student or the creation of a hostile learning or work environment for the student. Accordingly, amorous or sexual relationships between faculty members and students under the circumstances provided under Section [2.4.2.3.\(1\)](#) below are expressly prohibited. Amorous or sexual relationships between faculty members and students not otherwise prohibited are strongly discouraged.

(1) Prohibited Conduct

The following conduct is prohibited:

- (a) A faculty member shall not have an amorous or sexual relationship (consensual or otherwise) with a student who is not the faculty member's spouse and who is simultaneously enrolled in a course taught by the faculty member or whose academic or work performance is subject to the supervision or evaluation of the faculty member.
- (b) A faculty member shall not have an amorous or sexual relationship (consensual or otherwise) with a student who is not the faculty member's spouse and to whom the faculty member, as part of the faculty member's job-related responsibilities, provides academic advising, mentoring, or tutoring.
- (c) Retaliation is prohibited against any person who reports conduct prohibited under this Section [2.4.2.3.\(1\)](#). Retaliation is also prohibited against any person who participates in an OEI investigation of a report of prohibited conduct under this section.

(2) Reporting Violations

Reports of possible violations of Section [2.4.2.3.\(1\)](#) above should be reported to the OEI for review and investigation. Certain conduct described in this section may also trigger a mandatory reporting obligation under the Title IX Policy: (1) if the involved student is a minor; (2) if the conduct appears to violate the Title IX Policy; or (3) if reporting is otherwise required by law or University policy. In the case of uncertainty about the reporting obligation, OEI officials may be consulted without providing personally identifiable information in order to clarify the reporting obligation, or to get more information about how the OEI might handle a possible violation of this section.

4. Prohibited Discrimination Against Pregnant Students

Discrimination against any student, or exclusion of any student from participation in any part of a UTC educational program or activity, on the basis of a student's pregnancy is prohibited, as provided under state or federal law. UTC educational programs and activities include, but are not limited to, classes, extracurricular activities, internships, fellowships, clinics, and labs. When necessary to ensure a pregnant student's access to an educational program or activity, UTC will provide reasonable adjustments to the program or activity for the student, in accordance with the [Policy on Educational Accommodations for Pregnant Students](#).

2.4.3. Discipline and Appeal Rights

A faculty member who is found to have violated a University policy prohibiting discrimination or other provision of this [Section 2.4](#), including but not limited to [UT Policy HR0220 - Equal Employment Opportunity](#), [UT Policy HR0280 - Sexual Harassment & Other Discriminatory Conduct](#), and the [Title IX Policy](#), may be subject to discipline up to and including termination. Any disciplinary action taken against a faculty member for violation of the University's anti-discrimination policies or other provision of this [Section 2.4](#), and any appeal of such disciplinary action, must be in accordance with [Section 5.4.2](#). (tenured faculty) or [Section 5.4.3](#). (non-tenured faculty).

2.5. SEXIST LANGUAGE

It is the practice at UTC to avoid the use of sexist words and terms in all official correspondence and publications. Every reasonable attempt should be made to comply with this policy and to assist in making UTC a model for real as well as perceived equal treatment in organizational communications. The following serves as a guideline for all written materials:

Avoid sexist words and terms. Do not avoid them, however, at the expense of correct grammar. Almost all sexist language problems—especially "he" or "she" constructions—can be eliminated by careful writing or rewriting.

2.6. DRUG-FREE CAMPUS AND WORKPLACE

It is the policy of the University to maintain a safe and healthful environment for its students and employees. Therefore, University policy prohibits the unlawful use, manufacture, possession, distribution, or dispensing of drugs ("controlled substances" as defined in the Controlled Substances Act, 21 U.S.C. 812) and alcohol on University property or during University activities. For more information, please see [UT Policy HR0720 - Drug Free Campus and Workplace](#).

2.7. PERSONNEL FILES AND RELEASE OF INFORMATION

The University maintains official personnel files on every University employee and has adopted [UT Policy HR0130 - Personnel Files and Release of Information](#) to assure that accurate and complete personnel data are maintained, that individual employees are afforded an opportunity to see that their records reflect such standards, and that the release of information from personnel files is adequately monitored.

Under the Tennessee Public Records Act, personnel records of all University employees are public records which may be inspected and copied by citizens of Tennessee during regular business hours. Public records include "all documents, papers, letters, maps, books, photographs, microfilms, electronic data processing files and output, films, sound recordings, or other materials regardless of physical form or characteristics made or received pursuant to law or ordinance or in connection with the transaction of official business by any governmental agency" (Tenn. Code Ann. § 10-7-503(a)(1)(A)). This law is addressed by [UT Policy HR0130](#), which includes a list of information to be redacted (when possible) before record release and a list of documents to be stored permanently. At UTC, these documents are found in Human Resources, Academic Affairs, and college and departmental personnel files.

2.8. ETHICAL CONDUCT OF FACULTY

Faculty members should be familiar with and must comply with University policies governing the ethical conduct of faculty, including the policies set forth under [Chapter 7](#) of this Handbook.

2.9. GENERAL STATEMENT OF STUDENT-RELATED AND PROFESSIONAL RESPONSIBILITIES OF FACULTY

Faculty members carry a wide range of specific responsibilities—to students, to professional colleagues, and to UTC. The statement of responsibilities below represents UTC's view of those specific responsibilities of its faculty members:

2.9.1. Responsibilities to Students

Faculty members have the responsibility to deal seriously and conscientiously with the instructional assignment, including careful planning of courses, preparation of class meetings, regularity in meeting scheduled classes, clear communication to students of course requirements through presentation of course syllabi (further description of appropriate syllabus material appears in the appendices), and fair and impartial grading according to standards established by the institution.

Faculty members should recognize that students deserve respect as individuals and have certain rights that must be protected. This encompasses an active interest in individual academic and personal problems of students, the giving of mature professional advice, courteous treatment of students in class, and keeping in confidence personal information about students that may come to the attention of faculty members in their role as counselors, subject to university, system, and state policies for reporting.

Faculty members should recognize that faculty members serve as models and exercise a great influence in shaping young minds. This being true, faculty members must try to set a high standard in:

- Academic and scholarly excellence
- Personal integrity
- Professional ethics

Faculty members should recognize that in their influential classroom roles, they are morally bound not to take advantage of their positions by repeatedly introducing into classes discussions of subject matter outside the scope of the course and not within their field of professional competence.¹

2.9.2. Professional Responsibilities

Faculty members have the following general professional responsibilities:

1. Special responsibility to keep up to date with developing knowledge in their academic disciplines through familiarity with recent publications and journals and participation in local or national professional societies and meetings where appropriate.
2. Responsibility to seek ways of improving their effectiveness as teachers, exploring new ways of presenting academic subject matter, motivating students, and improving methods of evaluating student performance.

3. Responsibility to advance knowledge in their respective academic disciplines through individual research, creative writing and analysis, and presenting papers at colloquiums or professional meetings.
4. Responsibility to assist faculty colleagues in academic department and college activities including:
 - (1) Contributing to curriculum studies at both the departmental and college levels
 - (2) Participating in department, college and University faculty meetings for the better operation and strengthening of the educational program of the institution
 - (3) Carrying a fair share of the burden of special faculty committee assignments, including participation in such bodies as curriculum committees and honors program committees, as well as sharing in joint faculty responsibilities such as registration, counseling, and academic proctoring
 - (4) Responsibility to exercise an active role in protecting and enhancing the academic and professional standing of the faculty by:
 - Assisting with recruitment of competent new faculty members
 - Giving appropriate recommendations regarding promotion or tenure appointments for faculty colleagues
 - Recommending the removal of colleagues who, after fair hearing, have been proved to warrant removal for adequate cause
 - (5) Responsibility to demonstrate respect for the right of others in the UTC community to hold

¹ Statement adapted from Asa Knowles' *1970 Handbook of College and University Administration*. Used with permission of the publisher, McGraw-Hill.

divergent opinions, including other faculty members, students and administrators.²

2.10. FACULTY RESPONSIBILITIES RELATED TO TEACHING AND ADVISING

A university's worth is determined in large measure by the quality of its teachers. The styles of good teaching vary almost as much as the many disciplines in a complex university. The size and academic level of the class, the personality of the teacher, the goals of the students, the kind of subject matter under investigation, the expectations of a profession or of the public—all affect the definition of what constitutes good teaching. UTC acknowledges and supports this variety. It supports as well the seriousness of the UTC faculty's commitment to good teaching and recognizes the students' legitimate expectations in this important aspect of UTC's mission.

Good advising (as assigned) is an important aspect of many faculty roles. Indeed, good teaching, scholarly research and academic advising are mutually supporting aspects of faculty excellence. The serious UTC student is learning how to learn and also how to relate the several parts of the college experience (the classes, lectures, readings, discussions, labs and extra-classroom endeavors) to some emerging sense of a whole. Good advising is a crucial aspect of this search for unity and integrity in the many parts. To be good academic advisors, faculty must be knowledgeable about the curriculum and the students. All students are

required to see their advisor at least once a semester to discuss the many choices and goals that need to be considered. Every student should know some faculty member well enough to ask for an informed, personal letter of reference or recommendation when the time comes for graduation. The faculty member has, in turn, much to learn from the advisee and from the careful inspection of curriculum that advising requires. A good advisor is better informed about the issues that face the faculty when it votes on curriculum and on admission and graduation requirements.

Course loads should be consistent with UTC and departmental policies. Advising students, as assigned, is considered to be an integral part of the teaching obligation, and instructors are expected to give assistance freely to students in their classes. In addition, faculty members are expected to provide competent counsel to students assigned for overall course planning.

All members of the faculty are expected to attend commencement exercises in support of student success and accomplishments and in accordance with college and departmental bylaws.

2.11. FACULTY RESPONSIBILITIES TO CLASS ADMINISTRATION AND STUDENT INTERACTIONS

The following statements cover important aspects of UTC's expectations for faculty members' administration of their classes, including their relationships with students in the classroom and related interactions, as well as its general philosophy governing the rights and responsibilities of students in the classroom and related interactions with faculty members.³

2.11.1. Student Standards of Conduct

The [UTC Student Handbook - Student Rights & Responsibilities](#), published annually, contains statements concerning standards of conduct which students are expected to maintain and disciplinary procedures which may be used when unacceptable student behavior occurs. Faculty members are expected to encourage acceptable conduct on the part of students. In specific cases of student misconduct, faculty should consult with the Division of Student Development or the Division of Academic Affairs for guidance on how to appropriately address the misconduct.

2.11.2. Faculty Office Hours

² Statement adapted from Asa Knowles' *1970 Handbook of College and University Administration*. Used with permission of the publisher, McGraw-Hill.

³ For more information regarding student rights and responsibilities, please see [UTC Student Handbook - Student Rights & Responsibilities](#).

Faculty members are expected to maintain office hours so that they may be available to students and other members of the UTC community at stated places and times. Office hours should be clearly posted in a manner that is accessible to students.

2.11.3. Textbooks and Course Materials

Unless departmental approval is given, an instructor may not require students to purchase the instructor's own textbook for the courses the instructor teaches. Each department is responsible for

adopting and enforcing appropriate guidelines concerning textbook choices within the department. Additionally, any duplication and distribution of instructional materials must comply with [UT Policy FI0155 - Duplication and Distribution of Instructional Materials](#) and federal copyright statutes.

2.11.4. Meeting Scheduled Classes

Faculty members should meet their classes as scheduled; in the event faculty members are unable to meet class, it is their responsibility to notify the department head and arrange for a qualified replacement to conduct the class. Individual faculty members may not dismiss their classes without official authorization from their department head. Any decision to dismiss all university classes must be made by the Chancellor, or if absent, by an individual designated by the Chancellor.

2.11.5. Freedom of Expression

Free and pertinent discussion is welcome at UTC. Students should feel free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion. Students are responsible, however, for learning the content of any course of study for which they are enrolled.

2.11.6. Academic Evaluation

Faculty are expected to evaluate student performance honestly and professionally, based solely on academic considerations and not on opinions or conduct in matters unrelated to academic standards. Students are responsible for meeting the academic standards and requirements of each course in which they are enrolled. In order to make clear to students the basis for academic evaluation, faculty members normally should satisfy the following general guidelines: a) provide written course objectives, criteria and methods of student evaluation to the students near the beginning of each course; b) provide a written make-up examination policy near the beginning of each course; c) return graded exercises to the student promptly; d) provide a mid-term grade in writing to students by the middle of the semester or term at the latest; e) make themselves reasonably available to students for conferences and make reasonable efforts to assist students who are having difficulty in their courses. However, the burden of taking advantage of such opportunities falls on the student. A student alleging unfair evaluation may appeal pursuant to the applicable grade appeal procedure referenced under [Section 2.11.16.](#) below.

2.11.7. Academic Integrity

UTC expects that all academic work will provide an honest reflection of the knowledge and abilities of both students and faculty. Cheating, plagiarism, fabrication of data, providing unauthorized help and other acts of academic dishonesty are abhorrent to the purposes for which the UTC exists.

1. UTC Honor Code

The Honor Code is designed to foster a campus-wide climate of honesty and integrity in order to insure that students derive the maximum benefit from their work at UTC. All students are subject to the rules and regulations of the UTC Honor Code upon registration at UTC. Faculty members have a general responsibility to make students aware that the Honor Code governs all

of their academic work at UTC. Faculty members should stress that, although the Honor Code applies only to student work, the principles which it embodies, especially the principle of giving proper credit for another's ideas, are binding upon all members of the academic community. The Honor Code places responsibility for maintaining academic honesty on the student, but faculty are free to supervise examinations and other graded work in whatever way deemed appropriate.

The rules and regulations governing the UTC Honor Code and the procedures and disciplinary measures for addressing violations of the Honor Code are provided under the Tennessee Rules and Regulations for the UTC Honor System ([Tenn. Comp. R & Regs. § 1720-02-01-.01 et seq.](#)) and can also be found in the [UTC Honor Code Handbook](#).

(1) Reporting Honor Code Violations

Either through their own observation, reports from students, or other means, faculty members may confront suspected violations of the Honor Code. The faculty member must make a preliminary judgment about the seriousness of the incident and judge whether it is a possible violation of the Honor Code. If the incident appears to be a violation of the Honor Code, the faculty member must then decide whether the seriousness of the incident and the evidence are sufficient to justify a formal report to the Office of Student Conduct. Formal reports of suspected Honor Code violations should be submitted to the Office of Student Conduct.

Faculty members are strongly encouraged to report suspected violations of the Honor Code to the Office of Student Conduct. The Office of Student Conduct (or designee) is empowered, through the Honor Code Process, to impose penalties more severe than those which an individual faculty member can impose. Only through the process of reporting suspected violations will it be possible to identify and deal with students whose academic work is habitually dishonest. If a faculty member chooses not to formally report an Honor Code violation to the Office of Student Conduct, the faculty member is not permitted to penalize the students involved without the students' knowledge and consent.

(2) Resolution of Honor Code Violations

A student accused of an Honor Code violation is guaranteed the right to a hearing to contest the accusation before either: (1) an Honor Code Officer, (2) the Honor Code Board⁴ or (2) an Administrative Judge in accordance with the Uniform Administrative Procedures Act ("APA") (Tenn. Code Ann. §§ 4-5-101 *et seq.*).⁵ The faculty member who reports the Honor Code violation ("faculty member reporter") and other faculty members who are necessary witnesses will be requested to appear at the hearing. If appearing and called upon to testify at the hearing, the faculty member reporter should present a clear and impartial account of the incident in question and present to the decision-maker (i.e., Honor Code Officer, Honor Code Board, or APA Administrative Judge) any relevant evidence, especially written evidence, at the faculty member's disposal.

Where a faculty member reporter who is willing to appear at an Honor Code Officer or Honor Code Board hearing but has provided adequate prior notice of a reasonable excuse for not being able to appear at the hearing, the Honor Code Officer or Honor Code Board

⁴ The rules and procedures governing Honor Code Officer and Honor Code Board hearing proceedings are provided under the Tennessee Rules and Regulations for the UTC Honor Code ([Tenn. Comp. R & Regs. § 1720-02-01-.01 et seq.](#)), and can also be found in the [UTC Honor Code Handbook](#).

⁵ The rules and procedures governing APA hearing proceedings are provided under the Tennessee Rules and Regulations for APA Hearings ([Tenn. Comp. R. & Regs. § 1720-01-05-.01 et seq.](#)).

has the discretion to hold the hearing in the faculty member reporter's absence if it reasonably concludes that a delay in holding the hearing may result in undue harm to the accused student.

2. Employee Academic Misconduct

UTC's [Policy on Employee Academic Misconduct Involving Students](#) prohibits all UTC faculty and staff employees from engaging in academic misconduct in student academic matters. Prohibited academic misconduct under the policy includes academic fraud relating to a student (e.g., falsifying a student's transcript); authorizing, enabling or assisting violations of the Honor Code by a student; and providing impermissible academic assistance to a student.

2.11.8. Students with Disabilities

Under certain circumstances, UTC is obligated, under the Americans with Disabilities Act (ADA) of 1990 and Section 504 of the Rehabilitation Act of 1973, to make reasonable accommodations to provide qualified students with disabilities the opportunity for full participation in academic programs and activities. Reasonable accommodation may include increasing physical accessibility, modifying teaching/testing practices, acquiring equipment/devices, course substitution,⁶ and/or providing qualified readers or interpreters. Faculty who have students with disabilities in their classes are expected to be sensitive to the special needs of those persons. The [UTC Disability Resource Center](#) should be contacted for information regarding possible reasonable accommodations for students with disabilities.

2.11.9. Make-Up Examination Policy

Students are responsible for meeting all course requirements, including graded exercises which are administered in class. Along with other course requirements, policies covering make-ups for graded exercises normally are announced at the beginning of the course. In the event of an impasse between the instructor and the student over the questions of make-up, the student may appeal to the department head, director or program coordinator.

2.11.10. Final Exams

Final examinations are to be given at the scheduled time during final exam week. If an emergency should arise, or if there are scheduling difficulties, the faculty member should consult with his or her dean.

2.11.11. Attendance Policy and Excuses

At the beginning of the semester, faculty members should state to their classes their policy on absences. It is the student's responsibility to inform the instructor when documented illness, family emergency, participation in a University activity, or other reasonable excuse prevents attendance.

When absences are occasioned by University projects, students should check with their instructors, informing them of the possibility of the event and the classes to be missed. If the instructor wishes written confirmation of the organized trip before granting an excuse, a list of the student's classes along with the instructors' names and dates of the trip should be submitted to the office of the appropriate dean. All excuse requests must be submitted at least three days before the event. This list should be signed by the faculty advisor of the organization, who certifies as to the accuracy of the information. The dean returns the approved list to the faculty advisor, who issues copies to the students.

⁶ For more information regarding granting substitution of a course as a reasonable accommodation for a student with a disability, please see the [UTC Course Substitution Policy](#).

Upon receipt of appropriate documentation, the instructor should accommodate the missed coursework and communicate with the student how the make-up work should be accomplished. Specific information on make-up exams and missed work should be clearly stated in course syllabi.

2.11.12. **Academic Disputes**

Complaints or grievances will arise occasionally in the faculty-student relationship and should be clarified at the earliest possible time and at the level closest to the locus of the complaint. Students who have such complaints are urged to address them directly to the faculty member in an appropriate setting. It is understood that some issues may need to be addressed to the nearest administrator, generally the department or program unit head. Every effort should be made to resolve such matters informally by conversation. A matter unresolved on the departmental level may be brought to the appropriate dean and, after that, the Provost.

2.11.13. **Grade Change Policy**

Changing of a semester grade, once it has been reported to the records office by the instructor, may be made only in cases of computational error, for removal of an incomplete, or in cases of academic dishonesty after the conclusion of the student conduct process. Students are not permitted to re-do work or do additional work (e.g., re-write a paper) after the end of the semester in order to receive a change of grade.

2.11.14. **Course and/or Instructor Evaluation**

Course and/or instructor evaluation by students is required by UTC. Such evaluations form one constituent of the overall evaluation of the faculty which includes, in addition, a self-evaluation, an evaluation by the department head, and an evaluation by the dean or other administrator.

2.11.15. **Retention of Student Papers**

A faculty member who chooses not to return papers to the student should keep graded exams and papers for a minimum of the next regular semester following the completion of a term, until the time period for filing a grade appeal has expired. In the event the faculty member goes on leave, papers should be kept until one semester after the faculty member's return from leave.

2.11.16. Student Grade Appeals

It is the prerogative and responsibility of members of the faculty to determine the final grade for each student according to criteria clearly defined and explained in the course syllabus.

If a student feels that his or her rights and interests have been seriously jeopardized by way of unfair, arbitrary or malicious exercise of faculty grading prerogatives, and desire to appeal the final grade, the student may file a grade appeal pursuant to the applicable grade appeals procedures linked below.

1. Undergraduate Students

The grade appeal process for undergraduate students is set forth in the [UTC Student Handbook - Academics](#).

2. Graduate Students

The grade appeal process for graduate students is set forth in the [Catalog of Academic Policies for Graduate Students - Grade Appeal Section](#).

Chapter 3

Tenure-Track and Tenured Faculty

The Board of Trustees' *Policies Governing Academic Freedom, Responsibility, and Tenure* ([UT Policy BT0006](#)), originally adopted in 1998, and all subsequent amendments, govern faculty rights and responsibilities. The following sections are intended as a general summary of the parts of the Board's policy relevant to tenure and tenure-track faculty and of UTC's related policies and procedures established in accordance with Board policy. Academic freedom is addressed in [Chapter 2](#) of this Handbook. In the event of any conflict or inconsistency between Board policy and this Handbook, Board policy will control.

3.1. SELECTION OF NEW FACULTY FOR TENURE-TRACK APPOINTMENTS

Except as otherwise provided in this chapter, all academic departments will follow departmental and college bylaws for conducting the search for and the hiring of new faculty for tenure-track faculty appointments. In general, selection of new tenure-track faculty follows the following process.

3.1.1. Authorization to Search

The dean or other appropriate administrator must obtain authorization from the Provost to begin a search for a tenure-track faculty position. Factors considered by the Provost in determining whether to authorize a search for a tenure-track position include demonstrated need of the academic department's academic program and availability of funds for the position. The tenure-track position may be a new position or an existing position that is or is expected to be vacant. The authorization by the Provost of a search for a new or existing tenure-track position does not necessarily mean that an appointment will be made to the position.

3.1.2. Commitment to Diversity

UTC is fully committed to diversity in recruitment at all levels. Efforts must be made by the academic department to advertise position vacancies in an effort to obtain a diverse pool of qualified applicants. For each search, the Director of the Office of Equity and Inclusion ("OEI") will be contacted to advise the academic department as to appropriate search procedures that should be followed.⁷ Prior to an appointment being offered for a position, the Director of the OEI must certify that appropriate search procedures have been followed in the search for the position.

3.1.3. Search Process

A thorough search and careful selection should precede any departmental recommendation of appointment to the dean. The department head should consult with the departmental faculty members to develop a plan for the search process. Under normal circumstances, the departmental faculty members or a faculty member search committee should identify the needs of the program, the characteristics needed in a new faculty member, and a timeline of the procedures to be followed in conducting the search and screening candidates. The department head and the departmental

faculty members should approve the plan. The departmental faculty members should have the opportunity to help determine the kind of person needed, the search procedure to be followed, the basic pool of candidates, the persons to be selected for interview, and to provide an assessment of candidates interviewed. At each of these stages, final responsibility for the departmental recommendation rests with the department head.

⁷ The OEI search procedures can be found [here](#).

3.1.4. Certification of English Language Competency

No individual shall be appointed to a teaching position or recommended for tenure in such a position unless the department head, in consultation with the departmental faculty members, certifies in writing to the Provost that the individual can communicate effectively with students in the English language. Individuals who teach courses that are conducted primarily in a foreign language are exempt.⁸ The certification form is available on the UTC Academic Affairs website [here](#).

3.1.5. Recommendation to Appoint

A departmental recommendation of appointment for a tenure-track position shall be made by the department head to the dean. If the dean agrees with the departmental recommendation, the department head and dean shall forward the recommendation to the Provost. Each recommendation should be accompanied by a full set of the candidate's credentials and any required forms or certifications. Following a departmental decision to recommend an appointment of a candidate to a position, there may be informal discussions concerning rank, salary and other terms of employment between the department head or dean and the candidate. Such discussions serve merely to shape and influence the recommendations of the department head or dean and do not constitute a binding commitment by UTC.

3.1.6. Official Notification of Appointment

Official notification of appointment is made by letter from the Provost. The letter of appointment must specify:

1. the rank at which the faculty member is being appointed;
2. the faculty member's initial salary and related financial conditions;
3. the faculty member's probationary status, indicating that he or she will be advised annually on his/her reappointment status and progress toward tenure and promotion;
4. the length of the faculty member's probationary period (i.e. the academic year during which a tenure decision must be reached); and
5. the faculty member's general duties and expectations.

Only the letter of appointment from the Provost to the candidate regarding the terms and conditions of the appointment is binding on UTC. Any other representations concerning the terms and

conditions of the appointment, whether oral or written, are not authorized by UTC and not binding on UTC.

The new faculty member's written acceptance of the letter of appointment, together with execution of normal UTC employment forms, completes the initial appointment to employment between UTC and the faculty member.

3.2. TENURED AND TENURE-TRACK APPOINTMENTS

Except as otherwise permitted in this chapter and agreed upon between UTC and a faculty member, all tenure and tenure-track appointments will be for either one academic year or for twelve months.⁹

⁸ See [UT System Policy Concerning English Language Competency of UT Instructional Staff](#).

⁹ See [Section 3.2.2](#), below regarding the Classifications of Tenure-Track and Tenured Appointments.

Academic departments shall provide their faculty members with the resources necessary to perform assigned duties, including office space, office and pedagogical supplies, support services, and equipment.

Academic departments should have consistent criteria for assigning teaching duties to all faculty members and should consider the views of non-tenure-track faculty members when preparing teaching schedules and other professional assignments.

Employment of relatives of a faculty member is permitted, subject to the restrictions set forth under [UT Policy HR0115 - Employment of Relatives](#).

3.2.1. Criteria for Appointment to Faculty Rank

Criteria for appointment to faculty ranks reflect the rigorous preparation necessary for University teaching and research, the various service activities expected of the faculty members of a major university, and the diversity of missions performed by academic departments. For all faculty ranks, concerned and effective advising and counseling, where appropriate, is normally understood to be part of the task of teaching.

UTC has established the following general criteria that faculty members are expected to meet for the appropriate rank. Each academic department must establish its own metrics and standards for evaluating such criteria for faculty rank appointments within the department, and the department's specific metrics and standards shall be published in the department's bylaws. In regard to evaluation of librarians, "librarian" should be substituted for the word "teacher."

1. An Assistant Professor is expected to:

1. have a doctorate degree or other terminal degree in his or her discipline or present equivalent training and experience;
2. show potential or have demonstrated ability as a teacher;
3. show potential or have demonstrated evidence of research, scholarship, or creative activity;

4. have demonstrated willingness to participate effectively in professional activities other than teaching and research; and
 5. have demonstrated ability to relate appropriately to students and professional colleagues.
2. An Associate Professor is expected to:
1. have a doctorate degree or other terminal degree in his or her discipline or present equivalent training and experience;
 2. have achieved a reputation as an accomplished teacher;
 3. have achieved a good record in research, scholarly, or creative activities;
 4. have an established record of effective participation in professional activities other than teaching and research;
 5. have demonstrated ability to relate appropriately to students and professional colleagues; and
 6. have demonstrated excellence in at least one of the three areas of responsibility (i.e., teaching, service, and research) required for full-time faculty status.
3. A Professor is expected to:
1. have a doctorate degree or other terminal degree in his or her discipline or present equivalent training and experience;
 2. have achieved and maintained a reputation as an accomplished teacher;
 3. have achieved and maintained a significant record in research, scholarly or creative activities;
 4. have achieved and maintained a significant record of effective participation in professional activities other than teaching and research;
 5. have demonstrated an ongoing ability to relate appropriately to students and professional colleagues; and
 6. have demonstrated excellence in at least two of the three areas of responsibility (i.e., teaching, service, and research) required for full-time faculty status.
4. "All But Dissertation" Appointees

A faculty member who has not completed the terminal degree in his or her discipline (e.g., Ph.D.) but who otherwise meets all of the other criteria for the rank of Assistant Professor may be initially appointed to a tenure-track full-time academic year appointment at the rank of Assistant Professor and noted as "All But Dissertation" or "ABD," subject to the following conditions:

- If appointed in August, the faculty member will be required to complete his or her terminal degree on or before July 31 after completing his or her first full academic year (i.e., Fall and Spring

semesters) in order to retain the rank of Assistant Professor; or

- If appointed in January, the faculty member will be required to complete his or her terminal degree on or before July 31 after completing half of his or her first academic year (i.e., the Spring semester) in order to retain the rank of Assistant Professor; or
- Such conditions as are imposed by the Provost at the time of the faculty member's initial appointment and set forth in the initial appointment letter.

The faculty member's failure to complete his or her terminal degree within the applicable time period set forth in this section constitutes adequate cause for terminating the faculty member's employment. The tenure probationary period for a faculty member initially appointed under such circumstances is treated in an identical manner as the tenure probationary period for a faculty member initially appointed at the rank of Assistant Professor who already has his or her terminal degree at the time of the appointment.

3.2.2. Classifications of Tenure-Track and Tenured Appointments

Tenure-track and tenured appointments consist of regular full-time academic year appointments and regular full-time twelve-month appointments.

1. Regular Full-Time Academic Year (Nine-Month) Appointment:

Regular full-time academic year appointments involve full-time service during the nine-month academic year (Fall and Spring semesters). One-half of the faculty member's annual salary is earned for service for the Fall semester and one-half of the faculty member's annual salary is earned for service for the Spring semester. Regular full-time academic year appointments typically commence in August at the beginning of the Fall semester. The faculty member's annual salary for the nine-month appointment is prorated and paid over twelve (12) months, as earned, in monthly installments from August to July.

In some cases, regular full-time academic year appointments may begin in January at the beginning of the Spring semester. In such cases, the faculty member may be compensated in one of two ways for the Spring semester of the initial appointment, as agreed upon between the department head and the faculty member:

- The faculty member's salary earned for service for the Spring semester (i.e., one-half of the faculty member's total annual salary) is prorated and paid, as earned, over six (6) months from February to July; or
- The faculty member's salary earned for service for the Spring semester (i.e., one-half of the faculty member's total annual salary) may be prorated and paid, as earned, over seven (7) months from January to July.

2. Regular Full-Time Twelve-Month Appointment

Regular full-time twelve-month appointments involve full-time service for twelve months out of a year commencing on July 1 and ending the following June 30. The faculty member's total annual salary is paid, as earned, in twelve (12) monthly installments from July to June. Faculty members under regular full-time twelve-month appointments are entitled to vacation and sick

leave accruals in accordance with [UT Policy HR0305 - Annual Leave \(Vacation\)](#) and [UT Policy HR0380 - Sick Leave](#).

3.3. PROBATIONARY PERIOD

A tenure-track faculty member must serve a probationary period at UTC prior to being considered for tenure.

3.3.1. Length of Probationary Period

Except as otherwise provided in [UT Policy BT0006](#), the probationary period of a tenure-track faculty member shall be six years. The faculty member will apply for tenure during the sixth year, and if tenure is not granted, the faculty member will be permitted to serve a seventh year as a terminal year. If a faculty member begins employment after July 1 and before January 1, the remaining term of the faculty member's initial appointment will count as the first year of the probationary period, so that what is treated as the first year of a faculty member's probationary period will not be shorter than six months.

For tenure-track full-time academic year appointments that begin in January, the faculty member's probationary period begins on August 1 of the year in which the original appointment is made. For example, the tenure probationary period for an original appointment made in January 2020 would begin in August 2020 and the faculty member's first reappointment review would be performed in the 2020-2021 academic year.

The provision of a probationary period and any statement in an appointment letter or otherwise regarding the probationary period and the year of mandatory tenure consideration does not guarantee retention of the faculty member for the full probationary period.

3.3.2. Applying for Early Tenure

A tenure-track faculty member may request an early consideration for tenure before the sixth year of his or her probationary period ("early tenure") subject to the following limitations:

- A faculty member may apply for early tenure during years 2, 3, and 4 of the probationary period; however, if tenure is not granted, the faculty member must wait for one complete annual tenure cycle before reapplying; and
- A faculty member may apply for early tenure in year 5 of the probationary period. If tenure is not granted, he or she may reapply in the final year of the probationary period.

A faculty member should seek early tenure only after consultation with his or her departmental RTP Committee, department head and/or dean, which should include a thorough conversation about the faculty member's record.

3.3.3. Extension of Probationary Period

For good cause that is either related to procedural error or results from a significant disruption of University operations that has impeded the faculty member's opportunity to conduct required

research or other scholarly activity, teaching, and/or service, UTC and a tenure-track faculty member may agree in writing to extend a six-year probationary period for a maximum of two additional years (not including any extension granted due to the coronavirus crisis as authorized by the UT Board of Trustees' March 27, 2020 action). The proposed extension must be approved in advance by the Provost, the Chancellor, and the UT System Vice President for Academic Affairs.¹⁰

3.3.4. Suspension of Probationary Period

The Provost shall decide whether the probationary period will be suspended when the following circumstances occur:

1. the faculty member accepts a part-time faculty position;
2. the faculty member accepts an administrative position; or
3. the faculty member is granted a leave of absence or modified duties assignment.

The Provost shall give the faculty member written notice of the decision concerning suspension of the probationary period.¹¹

3.4. FACULTY EVALUATION AND DEVELOPMENT

UTC utilizes the Faculty Evaluation and Development by Objectives (EDO) process for its annual evaluations of its faculty members. The EDO process is an annual performance- oriented system that is based on identifying objectives, establishing a realistic program for obtaining the objectives, and evaluating and rewarding performance in achieving the objectives. The scope of the EDO process is broad in that the format of the review process is consistent for all members of the faculty, is evidentiary- based, and represents common goals of all faculty members. The EDO process also recognizes unique

¹⁰ See Section III.E.2. of [UT Policy BT0006](#).

¹¹ See Section III.E.3. of [UT Policy BT0006](#).

disciplinary characteristics and expectations of the faculty members working within their academic discipline.

The evaluation of a faculty member's performance is an essential component of the EDO process. The performance evaluation provides a formative and summative assessment of the faculty member's performance so that the faculty member can maintain or improve subsequent performance; serves as a basis for promotion, tenure, salary, and other decisions; and provides accountability with regard to the quality of teaching, research and service to those concerned with the institution. Essential to the annual evaluation process and progress toward promotion and/or tenure is the linking of the expectations for annual performance to the long-term efforts toward promotion and/or tenure. Departmental bylaws should clearly describe the association of the annual EDO process with faculty progression toward promotion and/or tenure.

3.4.1. Areas of Evaluation

The evaluation of the performance of the faculty member focuses on the following three (3) areas of professional responsibility:

- teaching and advising;¹²
- research, scholarship, and creative activities; and
- professional service to the University, profession, and community.

Among these obligations, teaching and advising (as appropriate) are of highest importance at UTC. It is recognized, however, that research, and scholarly and creative achievement contribute significantly to good teaching and to the advancement of knowledge. It follows, then, that faculty members will be expected to be actively involved in research, scholarship or creative activity as well. The fundamental purpose of the institution is to serve the people of the community, state, and region, and it is expected that faculty members will contribute to the mission of UTC.

While the individual faculty member is expected to participate in each of the three areas, annual achievement will vary in accordance with the objectives established in conference with the department head. Lesser participation in one area should be counterbalanced by greater participation in others.

The mechanics for the EDO as they apply to tenure-track and tenured faculty members do not differ. However, the EDO process for tenure-track faculty members can and does have bearing on reappointment and tenure decisions. In turn, the EDO process for tenured faculty members can and does have bearing on promotion decisions, and is linked directly to the Enhanced Post-Tenure Performance Review (EPPR) process.¹³ It is the responsibility of the department head to ensure that the EDO process takes into account the distinction between tenure-track and tenured faculty members as follows:

- Tenure-Track Faculty Members: The EDO process should focus on faculty development and mentorship, and should help to determine whether the faculty member is making adequate progress towards receiving tenure.
- Tenured Faculty Members: The EDO process should focus on innovation and long- term goal setting and should ensure that the faculty member continues to meet the expectations of a tenured member of the faculty at such rank as determined by departmental by-laws.

¹² The scope of a faculty member's responsibility regarding "advising" is determined by departmental bylaws.

¹³ See Section III.I.3. and Appendix E of [UT Policy BT0006](#) for more information regarding the EPPR process.

3.4.2. EDO Process Calendar

The schedule of timelines for the annual the EDO review process is available on the UTC Academic Affairs website [here](#). Each tenured and tenure-track faculty member must be evaluated annually in accordance with Board policies.

3.4.3. Evaluation and Development by Objectives

An effective EDO process is one in which a faculty member's objectives are clear and in which discussion occurs on an ongoing basis between the faculty member and the department head regarding the faculty member's performance and progress toward achieving the faculty member's objectives.

1. EDO Objectives

Within the context of the institutional goals and long-range plans of UTC, individual faculty members propose objectives in writing on the [Individual Objectives Sheet Form](#), which they submit to their department heads for review, discussion, and approval. Since the objectives of the faculty are fundamental components of the EDO process, it is important that they be carefully prepared. It is the responsibility of the faculty member to clearly articulate in writing specific objectives and to demonstrate how the objectives relate to his or her professional development and responsibilities. It is the responsibility of the department head to provide an unambiguous review of the merit and quality of the faculty member's objectives within the context of the disciplinary standards for the profession and the expectations of the faculty member specified in the faculty member's letter of appointment. The following guidelines should be consulted during the stage of the EDO process for formulating the faculty member's objectives:

- The objectives must reflect the department, college, and University missions.
- The objectives should contribute to the faculty member's development as an effective faculty member.
- The objectives should be realistic and they should identify needed resources. Although a good objective will be challenging, it should also be attainable within the capabilities and resources of the faculty member and the University. Objectives should reflect the resources available to the faculty member.
- Objectives should specify an action to be taken or a task to be accomplished. At the time of evaluation, it should be clear whether or not a particular objective has been achieved.
- Objectives should be described in such a way that their completion may be objectively evaluated in a manner keeping with disciplinary standards. Not all objectives can or even should be quantified; but for those objectives that so lend themselves, the objectives should be stated in a manner so that the result is specific and subject to quantitative measures. When an objective aims for a qualitative result, understanding should be reached between the faculty member and the department head beforehand as to how and by what standards the outcome is to be judged.
- Once formulated, objectives should be set forth in writing in a completed [Individual Objectives Sheet](#) for the faculty member.

2. Review and Modifications of EDO Objectives

The faculty member and the department head will review the faculty member's objectives at the time of the faculty member's EDO review. If, after a faculty member's objectives have been established, the faculty member proposes to change his or her objectives before the next EDO review is conducted, the faculty member must immediately consult with and obtain the approval of his or her department head regarding the proposed changes.

3.4.4. Performance Ratings

Each tenured and tenure-track faculty member must be evaluated annually in accordance with Board policy. Performance ratings for annual reviews shall be as follows, and college and department bylaws must clarify the means and metric for each department head to employ in conducting these reviews:

3. Exceeds Expectations for Rank—eligible for significant merit pay or performance-based salary adjustment that is consistent with campus, college, and department fiscal situations;
4. Meets Expectations for Rank—eligible for minimum merit pay or performance-based salary adjustment that is consistent with campus, college, and department fiscal situations;
5. Needs Improvement for Rank—not eligible for merit pay or performance-based salary adjustment and, if tenured, required to implement an Annual Review Improvement Plan (see [Section 3.4.6.3.\(1\)](#) below).¹⁴ If tenure-track, required to implement an Annual Review Improvement Plan unless the faculty member receives a notice of non-renewal of his or her reappointment as provided under [Section 3.7.4.](#) below; and
6. Unsatisfactory for Rank—not eligible for any salary adjustment, and, if tenured, requires an Enhanced Post-Tenure Performance Review (see [Section 3.4.6.4.\(1\)](#) below).¹⁵ If tenure-track, required to implement an Annual Review Improvement Plan unless the faculty member receives a notice of non-renewal of his or her reappointment as provided under [Section 3.7.4.](#) below.

3.4.5. Performance Standards

Each college and academic department will establish the standards for evaluating performance of their faculty members in each of the three areas of professional responsibility: teaching, research, and service. The performance standards will be utilized in determining the assignment of performance ratings to faculty members for their annual reviews.

College and departmental performance standards must be approved by the dean and the Provost and should be kept on file in the office of the dean of the college. The performance standards must be included in the college and departmental bylaws. Any proposed changes in college or departmental performance standards must be approved by the dean and Provost. It is the role of the dean to encourage reasonably comparable levels of standards for the differing units within each college or school. It is the role of the Provost to encourage reasonably comparable standards for the differing colleges and schools at UTC.

Performance evaluations must be based on the published performance standards as stated in college and departmental bylaws. In applying the performance standards, the department head is charged with fairly and equitably identifying qualitative differences in performance of the academic department's faculty members.

¹⁴ See Section III.I.1. of [UT Policy BT0006](#).

3.4.6. Determination of Performance Ratings and Process

In the three areas of responsibility (teaching, research, and service), the department head will evaluate the faculty member's routine responsibilities established by the academic department, those defined by Board policy,¹⁶ and those identified in the faculty member's Individual Objectives Sheet for the period being evaluated. During the course of the year, a faculty member may undertake teaching, research, or professional service activities in addition to those listed in the faculty member's Individual Objectives Sheet and report such activities for consideration in the EDO evaluation process. The department head shall not utilize quotas or forced distributions of ratings in the determination of annual performance ratings of faculty members within the academic department.

For the faculty member's performance evaluation, the department head will report on the Individual Evaluation Form: (1) brief narrative evaluations of the faculty member's performance in each of the three areas of responsibility; and (2) a recommended composite rating of the faculty member's overall performance.

The department head will provide the completed Individual Evaluation Form to the faculty member. The faculty member must sign the completed Individual Evaluation Form to indicate that the faculty member has read and understood the department head's evaluation. The faculty member's signature does not indicate agreement with the department head's evaluation. Subject to the provisions under [Sections 3.4.6.1.-3.4.6.4.](#) below, the department head will send a copy of the faculty member's evaluation and other EDO documentation to the dean, and the dean will send to the Provost for review and approval/disapproval copies of the evaluations of all faculty members within the dean's college or a list of the names of the faculty members and their corresponding performance ratings.

1. Rating of Meets Expectations for Rank

If a faculty member disagrees with the department head's recommendation of a "Meets Expectations for Rank" rating, the faculty member must, within seven (7) days of signing the Individual Evaluation Form, submit a written response to the department head setting forth the basis for the disagreement. The department head's evaluation and the faculty member's written response will be forwarded to the dean along with the faculty member's EDO documentation, all of which will become a part of the faculty member's official EDO record. The dean will review the matter and forward to the Provost a written recommendation and a copy of the faculty member's EDO documentation. The Provost will review the matter and provide written notice of his or her decision to the faculty member, department head, and dean.

2. Recommendation for Exceeds Expectations for Rank

In cases where the department head recommends an annual performance rating of "Exceeds Expectations for Rank," the department head will forward the recommendation to the dean by attaching the Exceeds Expectations for Rank Recommendation Form to the faculty member's Individual Evaluation Form. If the dean agrees with the department head's recommendation, the dean will forward his or her recommendation for "Exceeds Expectations for Rank" to the Provost and provide a copy of the recommendation to the department head. The Provost will make his or her recommendation to the Chancellor for final award.

3. Rating of Needs Improvement for Rank

If a faculty member disagrees with the department head's recommendation of a "Needs

¹⁶ See [UT Policy BT0006](#).

Improvement for Rank" rating, the faculty member must, within seven (7) days of signing the Individual Evaluation Form, submit a written response to the department head setting forth the basis for the disagreement. Within three (3) days of receipt of the faculty member's response, the department head must provide to the departmental Reappointment, Tenure, and Promotion Committee (RTP Committee)¹⁷ written notice of the basis and rationale for the faculty member's rating and a copy of the faculty member's written response. Within seven (7) days of receipt of the department's head notice, the departmental RTP Committee will provide a written evaluation of the faculty member's record and a performance rating recommendation. The departmental RTP Committee shall include in its evaluation the number of votes for and against the recommended performance rating.

The department head's evaluation, the faculty member's written response, and the departmental RTP Committee's recommendation will be forwarded by the department head to the dean along with the faculty member's EDO documentation, all of which will become a part of the faculty member's official EDO record. The dean will review the matter and forward to the Provost a written recommendation and a copy of the faculty member's EDO documentation. The Provost will review the matter and provide written notice of his or her decision to the faculty member, departmental RTP Committee members, department head, and dean.

(1) Annual Review Improvement Plan

Except as otherwise provided in this [Section 3.4.6.3.\(1\)](#) or in [Section 3.4.6.4.\(1\)](#) below, within thirty (30) calendar days of the Provost's decision to approve a "Needs Improvement for Rank" rating for a faculty member, the faculty member must collaborate with the department head on an Annual Review Improvement Plan to be reviewed by the department head and recommended by him or her to the dean for review and approval/denial. The next year's annual review must include a progress report that clearly describes improvements in any area(s) for which improvement was required. The Annual Review Improvement Plan process is inapplicable if the faculty member's performance rating has triggered Enhanced Post-Tenure Performance Review.¹⁸ An Annual Review Improvement Plan is not required for a tenure-track faculty member with an overall performance rating of "Needs Improvement for Rank" who receives a notice of non-renewal of his or her appointment for the following year.

4. Rating of Unsatisfactory for Rank

If a faculty member disagrees with the department head's recommendation of an "Unsatisfactory for Rank" rating, the faculty member must, within seven (7) days of signing the Individual Evaluation Form, submit a written response to the department head setting forth the basis for the disagreement. Within three (3) days of receipt of the faculty member's response, the department head must provide to the departmental RTP Committee written notice of the basis and rationale for the faculty member's rating and a copy of the faculty member's written response. Within seven (7) days of receipt of the department's head notice, the

departmental RTP Committee will provide a written evaluation of the faculty member's record and a performance rating recommendation. The departmental RTP Committee shall include in its evaluation the number of votes for and against the recommended performance rating.

The department head's evaluation, the faculty member's written response, and the

¹⁷ See [Section 3.5](#), below for information regarding departmental RTP Committees.

¹⁸ See Section III.I.1. of [UT Policy BT0006](#).

departmental RTP Committee's recommendation will be forwarded by the department head to the dean along with the faculty member's EDO documentation, all of which will become a part of the faculty member's official EDO record. The dean will review the matter and forward to the Provost a written recommendation and a copy of the faculty member's EDO documentation. The Provost will review the matter and provide written notice of his or her decision to the faculty member, departmental RTP Committee members, department head, and dean.

(1) Enhanced Post-Tenure Performance Review

A tenured faculty member who receives an annual performance rating of "Unsatisfactory for Rank" will be subject to an Enhanced Post-Tenure Performance Review (EPPR). An EPPR is an expanded and in-depth performance review conducted by a committee of tenured peers and administered by the Provost.

An EPPR must be initiated when the Provost determines that a faculty member has:

- Requested an EPPR, after at least four annual performance review cycles since the last enhanced review (such as a previous EPPR or a review in connection with tenure or promotion);
- Received one overall annual performance rating of "Unsatisfactory for Rank"; or
- Received two overall annual performance ratings of "Needs Improvement for Rank" during any four consecutive annual performance review cycles.¹⁹

The procedures for conducting an EPPR are detailed in Appendix E of [UT Policy BT0006](#).

(2) Annual Review Improvement Plan

Except as otherwise provided in this [Section 3.4.6.4.\(2\)](#), within thirty (30) calendar days of the Provost's decision to approve an "Unsatisfactory for Rank" rating for a tenure-track faculty member, the tenure-track faculty member must collaborate with the department head on an Annual Review Improvement Plan to be reviewed by the department head and recommended by him or her to the dean for review and approval/denial. The next year's annual review must include a progress report that clearly describes improvements in any area(s) for which improvement was required. However, an Annual Review Improvement Plan is not required for a tenure-track faculty member with an overall performance rating of "Unsatisfactory for Rank" who receives a notice of non-renewal of his or her appointment for the following year.

3.4.7. Appeal of Annual Performance Rating

The Provost's decision regarding a faculty member's annual performance rating may be appealed pursuant to the appeal procedure under [Section 5.3](#) of this Handbook, except that the decision of the Chancellor on appeal shall be final and not appealable to the President. An Enhanced Post-Tenure Review or the implementation of an Annual Review Improvement Plan will not be stayed pending the appeal of an annual performance rating.

3.4.8. Periodic Post-Tenure Performance Review (PPPR)

The academic freedom afforded to faculty by a grant of tenure is essential to the University's principal mission of discovery and dissemination of truth through teaching, research, and service.

¹⁹ See Section III.I.3. of [UT Policy BT0006](#).

The Board has recognized and affirmed the importance of tenure in [UT Policy BT0006](#). The Board has also recognized its fiduciary responsibility to students, parents, and all citizens of Tennessee to ensure that faculty members effectively serve the needs of students and the University throughout their careers. To balance its dedication to academic freedom with its responsibilities, UTC, with the approval of the President and the Board, has established the procedures under this [Section 3.4.8](#), under which every tenured faculty member shall receive a comprehensive performance review no less often than every six years.

1. Post-Tenure Review Period

Except as otherwise provided in the procedures under this [Section 3.4.8](#), each tenured faculty member must undergo some form of comprehensive performance review ("post-tenure review" or "PTR") no less often than every six years. The PTR shall not substitute for the EDO process in the year a faculty member is scheduled for PTR.

The dean of each college shall develop, and submit to the Provost for approval, an initial plan for staggering post-tenure reviews to avoid excessive administrative burden at any given time. The initial staggering plan may be revised with the approval of the Provost if later developments require changes in order to avoid excessive administrative burden. The post-tenure review period begins at the granting of tenure, and, except as otherwise provided by the staggering plan, a faculty member's PTR will occur no less often than every six years thereafter unless one of the following circumstances results in a different timetable:

1. Suspension of PTR Period: A faculty member's PTR period is suspended during any year in which the faculty member is granted a leave of absence or a modified duties assignment.
2. Restarting of PTR Period Due to Alternative Comprehensive Review: A comprehensive review of a faculty member's performance restarts the faculty member's PTR period under the following circumstances:
 - (a) If a tenured faculty member undergoes a successful promotion review or a promotion is in progress during the year scheduled for the faculty member's PTR, the promotion review fulfills the PTR requirement and the PTR period is modified to require a PTR six years after the promotion review. An unsuccessful promotion review does not count as an Alternative Comprehensive Review.

- (b) If a tenured faculty member undergoes an Enhanced Post-Tenure Performance Review (EPPR) (generally triggered by annual performance review rating(s)) and is either rated as meeting expectations or successfully completes the terms of the EPPR improvement plan, the EPPR process fulfills the PTR requirement and the PTR cycle is modified to begin with the date of the EPPR committee's report.
3. Start of the PTR Period Upon Conclusion of an Administrative Appointment: Full-time administrators and faculty members with a majority administrative appointment (more than 50%) are not subject to PTR; faculty members holding a less than majority administrative appointment (50% or less) are subject to PTR regarding their faculty duties based on expectations consistent with their faculty duty allocation. When a full-time or majority-time administrator leaves his or her administrative position to assume a tenured faculty position, the faculty member's initial PTR shall occur within six years after leaving the administrative post.
 4. Commitment to Retire: When a faculty member submits a letter of resignation with a termination date within the academic year during which a post-tenure review would have taken place, and provided the letter of resignation is accepted by the Provost, the post-tenure review shall be deemed unnecessary.
 5. Good Cause: A faculty member's scheduled PTR may be otherwise deferred or modified only for good cause approved by the Provost.

2. Annual Schedule for Post-Tenure Reviews

All post-tenure reviews will be conducted and completed during the Fall semester according to the following schedule:

- The Provost shall notify all faculty members subject to post-tenure review in a given academic year no later than April 1 of the preceding academic year.
- The dean of the faculty member's college shall appoint all PTR Committees as set forth in [Section 3.4.8.3](#), below no later than May 1 of the preceding academic year.
- Each PTR Committee shall convene and elect a chair and shall be provided with the materials required by [Section 3.4.8.3](#), below no later than September 1.
- When external review is required as part of the post-tenure review by the PTR Committee in accordance with college bylaws or by the dean in accordance with college bylaws, or is requested by the faculty member for his or her post-tenure review, the PTR Committee shall solicit reviews from at least three (3) valid external reviewers no later than October 1.
- Each PTR Committee shall submit its report required under [Section 3.4.8.6](#), below no later than December 15.

3. Appointment and Composition of Post-Tenure Review Committee

- (1) All post-tenure reviews must be conducted by college-level committees established for the sole purpose of post-tenure review. Each PTR Committee shall include a minimum of three (3) members, provided the number is odd. Deans of larger colleges may opt to appoint a larger committee. The committee is appointed by the dean of the faculty member's college in the following manner:
- Each department may nominate at least one (1) member, but no more than three (3) members

of its tenured faculty, to serve on a college-level PTR Committee. The nominees should include no faculty member who is subject to post-tenure review in that cycle. The department nominee may hold the rank of Associate Professor only with prior approval of the dean and only in the event that no full Professor is eligible or available to serve.

- From among the departmental nominees, the dean shall appoint faculty members to serve on a PTR Committee for any specific faculty member (or group of faculty members) undergoing review. The members of a PTR Committee shall be appointed so as to avoid any conflict of interest with any faculty member (or group of faculty members) undergoing review.
- For the purpose of this process, a conflict of interest shall be defined as any professional or personal consideration between a PTR Committee member and a faculty member undergoing post-tenure review which may compromise, or have the appearance of compromising, the independence of the former's judgment during review of the latter.

(2) The composition of the PTR Committee must meet the following requirements:

- Each PTR Committee member must be a tenured full-time faculty member who is at the same or higher academic rank (except as provided under [Section 3.4.8.3.\(1\)](#) above), and whose locus of tenure is at the same campus as the faculty member being reviewed.
- One, and only one, PTR Committee member must hold an appointment in the same department as the faculty member being reviewed, unless there is no such faculty member eligible to serve.

College bylaws may further define the size and membership of a PTR Committee, accounting for the characteristics of the departments and faculties which constitute the college itself.

The Provost, working with the University of Tennessee Office of Academic Affairs and Student Success, will provide instructions, guidelines, and best practices to members of PTR Committees.

Each PTR Committee shall convene and elect a chair. The chair shall solicit and collect all required materials from each faculty member under review and the department head of each faculty member under review. The chair shall subsequently ensure that the committee meets in person for a thorough review of those materials.

4. Materials to be Reviewed by Post-Tenure Review Committee

The PTR Committee must review:

- (1)** a completed EDO (including the department head's evaluation and rating of the faculty member's performance, and student and any peer evaluation of teaching) for each year since the last review;
- (2)** EDO goals for the current review period;
- (3)** the faculty member's current Curriculum Vitae;
- (4)** a narrative, not to exceed two pages, prepared by the faculty member describing the faculty member's milestone achievements and accomplishments since the last review as well as goals for the next post-tenure review period; and
- (5)** if there has been a previous PTR, a copy of the narrative submitted as a part of the faculty member's previous PTR.

Items (1) – (2) above should be supplied by the faculty member's department head. Items (3) – (5) above should be supplied by the faculty member.

The PTR Committee may also review:

- (6)** external reviews, when external reviews are deemed necessary by the PTR Committee in accordance with college bylaws or when external reviews are deemed necessary by the dean of the faculty member's college in accordance with college bylaws. In the event that an external review is not deemed necessary by the PTR Committee or dean, external reviews may be requested by the faculty member undergoing post-tenure review.

When an external review is deemed necessary, or is requested, for a faculty member's post-tenure review, the materials to be reviewed for that faculty member (i.e., the materials listed under (1) – (5) above), will be sent to no fewer than three external reviewers. At least two external reviewers must provide written reviews.

The selection of the external reviewers for a faculty member is a collaboration between that faculty member and the PTR Committee conducting the review. The faculty member shall submit to the PTR Committee two lists: one list of no fewer than five names of valid reviewers, and a second list of names of individuals who must be excluded from the external review. Relying on its own counsel and expertise, the PTR Committee will create its own list of no fewer than five valid reviewers.

A valid reviewer is a tenured faculty member at a comparable institution of higher education holding the rank of full Professor and a terminal degree in the same discipline, or sufficiently-related discipline, as the faculty member undergoing post-tenure review. Preference should be given to valid reviewers from institutional peers of UTC.

From these two lists, the PTR Committee shall select exactly one name of a valid reviewer from the faculty member's list and two names of valid reviewers from its own list. From this panel of three reviewers, the PTR Committee shall solicit external reviews using a form letter provided by the Provost for this purpose. Each reviewer shall receive the same packet of materials (i.e., the materials listed under (1) – (5) as above), along with clear instructions on timely return of a review to the PTR Committee. Should a reviewer decline to review a candidate for post-tenure review, the PTR Committee may return to the two lists of valid reviewers and select another valid reviewer from whom to solicit a review.

At least two valid external reviewers must supply reviews to the PTR Committee reviewing a candidate for post-tenure review. In the event that two reviews from valid external reviewers cannot be secured, the chair of a PTR Committee may appeal to the Provost for a waiver of this requirement.

The reviews of external reviewers are advisory to the PTR Committee. In its conclusions and report, the PTR Committee should highlight relevant observations made by external reviewers, and describe the role that those observations played in the PTR Committee's conclusions and report.

5. Criteria for Post-Tenure Review

The post-tenure review process should ensure the faculty member has demonstrated continued professional growth and productivity in the areas of teaching, research (including published

scholarship and creative achievement), service, and/or clinical care pertinent to his or her faculty responsibilities. The criteria for assessing the faculty member's performance must be consistent with established expectations of the department, college, and UTC and provide sufficient flexibility to consider changes in academic responsibilities and/or expectations. The expectations for faculty performance may differ by college, department, and even among sub-disciplines within a department or program. Those expectations may be commonly-held standards in the discipline or sub-discipline. Those expectations may be stated explicitly in the faculty member's own past annual performance reviews, work assignments, goals or other planning tools (however identified), as well as department or college bylaws, this Handbook (including without limitation this [Section 3.4.8.](#)), and in other generally-applicable policies and procedures (for example, fiscal, human resources, safety, research, or information technology policies and procedures).

6. PTR Committee's Conclusions and Report

The PTR Committee is charged to review the faculty member's performance during the review period and to conclude whether the faculty member's performance satisfies the expectations for the faculty member's discipline and academic rank. All conclusions and recommendations shall be adopted upon the vote of a simple majority of the PTR Committee. No member of the PTR Committee may abstain or recuse themselves from voting. Based on the judgment of its members, the PTR Committee must conclude either:

- That the faculty member's performance satisfies the expectations for the faculty member's discipline and academic rank; or
- That the faculty member's performance does not satisfy the expectations for the faculty member's discipline and academic rank.

The committee must report its conclusions and recommendations in writing using a standard format prepared by the Provost, including (a) an enumeration of the vote, (b) the supporting reasons for its conclusion, (c) a dissenting explanation for any conclusion that is not adopted unanimously, (d) an identification of any incongruences observed between the faculty member's performance and his or her annual evaluations, (e) a statement of any additional concerns identified or actions recommended, and (f) if applicable, an identification of areas of extraordinary contribution and/or performance.

The PTR Committee shall send its detailed report to the dean of the faculty member's college. The dean shall make a written recommendation to accept or reject the PTR Committee's determination and which shall include the dean's justification for their recommendation. Within thirty (30) days of receipt of the PTR Committee report, the dean shall provide the report along with the dean's recommendation to the faculty member, department head, and Provost.

Upon receipt of the PTR Committee report and the dean's written recommendation, the faculty member and department head shall have thirty (30) days to provide the Provost their independent written responses to the PTR Committee report and the dean's recommendation.

After receipt of the written responses of the faculty member and/or department head, or confirmation that no such response(s) will be provided, the Provost shall review the PTR Committee report, the dean's written recommendation, and any written responses provided by the faculty member and/or department head, before making a final decision on the faculty

member's performance during the review period. The Provost shall provide notice of the Provost's final decision to the faculty member, department head, and dean in writing.

The PTR Committee report, the dean's written recommendation, any written response(s) from the faculty member and/or department head, and the Provost's final decision letter shall be maintained in UTC Faculty Records. At the conclusion of each academic year, a summary of all PTR decisions made at UTC that academic year will be compiled and submitted electronically to the University of Tennessee Office of Academic Affairs and Student Success.

7. Appeal

Within thirty (30) days of receipt of the Provost's final decision letter, the faculty member may appeal any conclusion with which the faculty member disagrees. The procedure for appeal is described in [Section 5.3.](#) of this Handbook, except that a final decision by the Chancellor on the appeal shall be made within ninety (90) days of the faculty member's appeal. The decision of the Chancellor on an appeal shall be final and not be appealable to the President. If the Chancellor's decision on an appeal does not concur with the PTR Committee's recommendation, with the dean's written recommendation, or with the Provost's decision, then the Chancellor shall provide supporting reasons for any such non-concurrence in the appeal decision letter.

8. Further Actions

If the PTR Committee concludes that the faculty member's performance has not satisfied the expectations for the faculty member's discipline and rank, a PTR improvement plan must be developed using the same procedures used for the development of an EPPR improvement plan as detailed in Appendix E to [UT Policy BT0006](#).

If the Provost concludes that deficiencies exist in the departmental annual performance review process (including failure of department heads to conduct rigorous annual performance reviews) or other incongruences are observed between the PTR performance review and rankings assigned through the annual performance review process, the Provost must develop a process for addressing the issues.

9. Annual Report to the Board

The Provost shall prepare an annual assessment report of campus post-tenure review processes, procedures and outcomes for submission by the Chancellor to the Board, through the President, no later than June 1 of each year. The report shall include a description of any deficiencies identified in departmental annual performance review processes and the plan for addressing the issues.

3.5. ROLE OF THE FACULTY IN THE EVALUATION PROCESS

In matters of evaluation, including retention, tenure and promotion, the role of the faculty is critical. Each department shall establish a standing Rank, Tenure and Promotion (RTP) Committee for considerations of reappointment, tenure, and promotion for faculty members within the department.

3.5.1. Departmental RTP Committee

1. Membership

The full membership of a departmental RTP Committee shall consist of all tenured faculty members within the academic department, except for the department head, and, if necessary, non-departmental tenured faculty members selected to the committee as provided under [Section 3.5.2.](#) below. Tenured faculty members on leave are eligible to sit on the RTP Committee but are not required to do so. Tenured faculty members on leave who are members of the committee have the right to vote in absentia on any matters before the committee. The membership of the departmental RTP Committee shall consist of at least three members.

2. Selection of Non-Departmental Members

If there are not three tenured faculty members within the academic department, the committee's membership will be augmented by tenured faculty members from academic departments of similar or related disciplines, generally within the same college, and/or if necessary, from academic departments of non-similar or non-related disciplines. For each vacancy on a departmental RTP Committee that must be filled in order to meet the three- person membership requirement, the department head shall prepare a list of at least two nominees, giving consideration to each nominee's expertise and familiarity with the nature of the discipline. The non-departmental committee members will then be elected by majority vote of all tenured and tenure-track faculty members within the academic department.

3. Procedures

The department head is responsible for calling an organizational meeting of the complete RTP Committee each academic year and for providing the committee with a record of EDO reports for each faculty member being considered for reappointment, tenure, or promotion in that year. The committee will elect a chair at the first called meeting. The departmental RTP Committee shall meet for deliberation and voting on matters before it. The committee's recommendations shall be by majority vote of its members.

In principle, no member of the faculty or administrative chain involved in making recommendations for reappointment, tenure, or promotion should make recommendations on any individual case at more than one level of the review process. Accordingly, no administrator who makes recommendations should serve on a departmental RTP Committee, nor should any such administrator be present during any meeting or deliberations of the committee unless invited by a positive vote of the committee. In particular, the department head shall not be present at any meeting or during any deliberations of the departmental RTP Committee. A faculty member serving on both the departmental RTP Committee and the college-wide Tenure and Promotion Review Committee may vote on a tenure and/or promotion recommendation at only one level of the tenure and promotion review process, either at the departmental RTP Committee level or at the college-wide Tenure and Promotion Review Committee level.

For a promotion recommendation, only those members of the committee already at or higher than the rank to which promotion is being considered are eligible to consider and vote on the promotion recommendation. All promotion recommendations must be considered and voted on by at least three eligible faculty members on the committee. If the committee does not have

three departmental members eligible to vote on a promotion recommendation, additional eligible non-departmental members must be selected to the committee in order to meet the three-person requirement pursuant to the process outlined in [Section 3.5.2.](#) above. Members of the committee who are eligible to consider and vote on a promotion recommendation are prohibited from consulting with departmental faculty members who are at a rank lower than the rank to which promotion is being considered. For reappointment, tenure, and promotion decisions, the committee will sit as a whole.

3.5.2. College-Wide Tenure and Promotion Review Committee

Each college shall determine and publish in its bylaws the composition, selection of membership, and procedures of the college-wide committee (or independent review committee) established for the review of tenure and promotion recommendations within the college. For a promotion recommendation reviewed by the committee, only those members of the committee already at or higher than the rank to which promotion is being considered are eligible to consider and vote on the promotion recommendation. The recommendations of the committee shall be advisory to the dean of the college.

3.6. REAPPOINTMENT OF TENURE-TRACK FACULTY

Faculty members holding tenure-track appointments are considered annually for reappointment. A tenure-track faculty member's annual reappointment review is separate from his or her annual performance evaluation, but it may be conducted concurrently with the annual performance evaluation.

3.6.1. First Year of Probationary Period

In the Spring semester of the first year of a faculty member's probationary period, the faculty member must apply for reappointment by submitting to his or her department head the faculty member's objectives for teaching, scholarship and professional/public/community service for the following year. The department head must approve the faculty member's objectives. Approved objectives will be used for the evaluation of the faculty member's performance for the second year of the faculty member's probationary period.

3.6.2. Subsequent Years of Probationary Period

In each subsequent year of a tenure-track faculty member's probationary period in which the faculty member applies for reappointment,²⁰ the faculty member must submit evaluation and reappointment materials to his or her department head for review. The evaluation and reappointment materials that a faculty member must submit are identified on the UTC Academic Affairs website [here](#).

3.7. REAPPOINTMENT REVIEW PROCESS

3.7.1. Regular Probationary Year Review

In each year of the tenure-track faculty member's probationary period in which the faculty member

is subject to consideration for reappointment, the department head is responsible for the careful evaluation of the faculty member in determining whether to recommend reappointment of the faculty member for the following year. Departments may elect to require that the departmental RTP Committee perform the initial evaluation and recommendation on reappointment in each year of the faculty member's probationary period and provide such recommendation to the department head. To the extent a department elects to do so, the department must include such a requirement in its departmental bylaws.²¹ Otherwise, the reappointment review process set forth in this [Section 3.7.1](#), shall be followed.

Unless otherwise provided in the department's bylaws, the department head's recommendation is the initial recommendation, except for in the mid-probationary review year (i.e., typically, the third year of the probationary period). In the mid-probationary review year, the departmental RTP Committee makes an initial recommendation regarding reappointment as provided under [Section 3.7.2](#), below.

In the event the department head recommends reappointment, the department head shall submit his or her written recommendation to the dean and inform the faculty member in writing of the recommendation. The department head's recommendation should note positive areas and areas where improvement is needed. If the dean agrees with the department head's recommendation, the faculty member shall be reappointed and the faculty member shall be notified in writing of the dean's decision.

In the event the department head makes a recommendation against reappointment, the department head must provide to the faculty member a letter stating the specific reasons for the recommendation against reappointment. The department head must also notify the RTP Committee of the academic department within five (5) days of providing the faculty member with notification of his or her recommendation. The department head should share with the departmental RTP Committee the basis and rationale for the recommendation. The departmental RTP Committee will then provide an additional written evaluation of the faculty member's record and recommendation. The departmental RTP Committee shall include in its evaluation the number of votes for and against reappointment.

The departmental RTP Committee's evaluation and recommendation must be provided to the department head within seven (7) days of the departmental RTP Committee's receipt of

²⁰ In last year of a faculty member's probationary period (typically, Year 6), a decision regarding tenure for the faculty member is made.

²¹ A department's adoption of such a requirement in its bylaws will modify the reappointment review process as set forth in this [Section 3.7.1](#), only as to the levels of review and recommendation before the dean's level of review and recommendation.

notification of the department head's recommendation. Upon receipt of the departmental RTP's evaluation, the department head shall submit his or her written recommendation to the dean along with the departmental RTP's evaluation and recommendation. If the dean does not agree with the recommendation against reappointment and decides to reappoint the faculty member, the faculty member shall be reappointed and the faculty member shall be notified in writing of the dean's decision. If the dean agrees with the recommendation against reappointment, the dean shall submit his or her recommendation against reappointment to the Provost.

Upon receipt of the dean's recommendation, the Provost will review the matter and make the final decision whether or not to reappoint the faculty member. The Provost will send a letter to the

faculty member notifying the faculty member of the final decision. The Provost will also communicate to the dean, department head, and the departmental RTP Committee (if appropriate) his or her decision and rationale.

The Provost must give notice to a tenure-track faculty member that his or her appointment will not be renewed for the next year pursuant to the schedule and requirements set forth under [Section 3.7.4.](#) below.

3.7.2. Mid-Probationary Review of Probationary Faculty (Enhanced Tenure-Track Review)

In a tenure-track faculty member's mid-probationary review year (i.e., typically, the third year of the probationary period), before the department head makes his or her recommendation, the departmental RTP Committee shall conduct a full review and evaluation (i.e., Enhanced Tenure-Track Review or ETTR) of the faculty member's progress towards tenure as part of the reappointment evaluation undertaken for the faculty member for that year.²²

The faculty member shall assemble a dossier thoroughly documenting progress toward tenure. The dossier must include artifacts, dated after his or her appointment to UTC, that demonstrate work as a teacher;²³ development as a scholar, researcher, or creator; and participation in service and other professional activities. Prior to the beginning of each academic year, the Provost shall provide a list of recommended materials which may be used for such evidence. The faculty member shall submit his or her dossier to the departmental RTP Committee for its review and evaluation.

The departmental RTP Committee shall provide to the department head a written report that will contain a list of the participating tenured faculty members; suggestions for enhancing the faculty member's progress toward tenure; the majority and minority report, if applicable; the summary anonymous vote on whether the faculty member is progressing satisfactorily toward the grant of tenure; and a recommendation for or against reappointment. Upon receipt of the departmental RTP Committee's report, the department head will present and discuss the departmental RTP Committee's report, as well as his or her own written assessment, and develop a plan to address suggested enhancement from the RTP Committee, with the faculty member. Copies of the ETTR documents will be given to the faculty member. A favorable ETTR does not commit the departmental RTP Committee, the department, or the college to a subsequent recommendation for the grant of tenure.

After meeting with the faculty member, the department head shall submit his or her written recommendation for or against reappointment to the dean along with the departmental RTP Committee's report and recommendation. The reappointment review for the faculty member's

²² In the discretion of the department head, the ETTR may be performed in the fourth year of the faculty member's probationary period. A faculty member's ETTR may be performed beyond the fourth year of the probationary period if the faculty member has been granted an extension of their probationary period (with the year to be determined by the department head after consultation with the faculty member and, if applicable, the faculty member's mentor).

²³ In regard to evaluation of librarians, "librarian" should be substituted for the word "teacher".

mid-probationary review year otherwise follows the same process as described under [Section 3.7.1.](#) above. An appeal regarding an ETTR may be made under the same procedures applicable to the appeal of an annual performance rating as provided under [Section 3.4.7.](#) above.

3.7.3. Roles of the Department Head and RTP Committee in the Reappointment Review Process

The roles of the department head and departmental RTP Committee in the reappointment process for a tenure-track faculty member under a typical six-year probationary period are summarized in the following chart:

Probationary Year	Department Head Role	RTP Committee Role
1	Establish goals and objectives for annual performance and achieving tenure	Providing input on reappointment of faculty is required only in instances where the department head recommends against reappointment*
2	Annual performance evaluation and progress toward tenure	Providing input on reappointment of faculty is required only in instances where the department head recommends against reappointment
3 Mid-Probationary Review Year (ETTR)	Annual performance evaluation and progress toward tenure	Provide input on reappointment and evaluation of faculty member's progress toward tenure
4	Annual performance evaluation and progress toward tenure	Providing input on reappointment of faculty is required only in instances where the department head recommends against reappointment
5	Annual performance evaluation and progress toward tenure	Providing input on reappointment of faculty is required only in instances where the department head recommends against reappointment
6 Tenure Decision Year	Provide evaluation regarding whether faculty met departmental and University standards for awarding tenure	Provide evaluation regarding whether faculty met departmental and University standards for awarding tenure

*As provided under [Section 3.7.1.](#) above, a department may elect to require that the departmental RTP Committee provide the initial recommendation on reappointment to the department head in each year of the faculty member's probationary period.

3.7.4. Notice of Non-Reappointment

Notice that a tenure-track faculty member's appointment will not be renewed for the next year shall be made in writing by the Provost according to the following schedule:

1. In the first year of the probationary period, not later than March 1 for an academic year

appointment and no less than three months in advance for any other term of appointment;

2. In the second year of the probationary period, not later than December 15 for an academic year appointment and no less than six months in advance for any other term of appointment;
and
3. In the third and subsequent years of the probationary period, not less than twelve months in advance.

These notice requirements relate only to service in a probationary period with the University. Credit for prior service shall not be considered in determining the required notice. Notice of non-renewal shall be effective upon personal delivery or upon mailing, postage prepaid, to the faculty member's residential address of record at the University.²⁴

3.8. CHANGES TO THE APPOINTMENT

As provided under [Section 3.7.1.](#) above, a faculty member is officially notified of reappointment by letter from the Provost or the dean. A faculty member is officially notified by letter from the Provost of any other changes in the terms of the faculty member's appointment, including, but not limited to, subsequent salary decisions or changes in rank, title or assignment. Any other representations, whether oral or written, concerning adjustments or changes to a faculty member's appointment or concerning a faculty member's reappointment are unauthorized and not binding on UTC. Normally, salary decisions and other changes in employment status are made following approval of the University budget by the Board at its annual meeting in June.

3.9. TERMINATION BEFORE EXPIRATION OF APPOINTMENT TERM

A tenure-track faculty member may be terminated before the expiration of his or her annual appointment term on the same grounds and pursuant to the same procedures applicable to the revocation of tenure and termination of tenured faculty members.²⁵

3.10. TENURE

Tenure is a principle that entitles a faculty member to continuation of his or her annual appointment until relinquishment or forfeiture of tenure or until termination of tenure for Adequate Cause (as defined under [UT Policy BT0006](#)), financial exigency, or academic program continuance. The burden of proof that tenure should be awarded rests with the faculty member. The grant of tenure shifts the burden of proof concerning the faculty member's continuing appointment from the faculty member to the University, except in the case of relinquishment or forfeiture of tenure. More information regarding the Board's policy on tenure can be found [here](#).

3.10.1. Authority to Grant Tenure

Tenure is acquired only by positive action of either the President or the Board, based on the circumstances under which tenure is sought, and is granted in a particular academic unit (department, school, or college). The Board makes the decision whether to grant tenure, based upon the recommendation of the President, to (1) all University Officers as defined in bylaws and adopted by the Board; (2) any faculty member who is to be granted tenure upon initial appointment

without serving a probationary period at UTC; and (3) any faculty member to be tenured after serving less than a six-year probationary period, but not including a faculty member who has been employed by the University in a tenure-track position for six years and whose probationary period has been suspended for one or more year(s) in connection with a leave of absence or modified duties assignment under Section 3.3.4.3 above. The President makes the decision whether to grant tenure, based upon the recommendation of the Chancellor, in all other cases. The President

²⁴ See Section III.E.4. of [UT Policy BT0006](#).

²⁵ The grounds and procedures for revocation of tenure and termination of tenured faculty members are set forth in Section III.J. and Appendices B and C of [UT Policy BT0006](#).

or the Board (as applicable according to UT Policy BT0006) may grant tenure at any time during a given year, after confirming that all tenure review and recommendation procedures in Appendix A of [UT Policy BT0006](#) have been followed.

3.10.2. Eligibility for Tenure Consideration

Board policy establishes the following minimum standards for eligibility for tenure consideration:

1. Regular, full-time, tenure-track faculty appointments at the academic rank of instructor, assistant professor, associate professor, or professor are eligible for tenure consideration;
2. Temporary, term, and part-time appointments are not eligible for tenure consideration, except that in the extraordinary circumstances defined in Board policy, faculty members who do not have a full-time appointment may be eligible for tenure consideration.²⁶

3.10.3. Tenure Upon Initial Appointment

No faculty member shall be granted tenure upon initial appointment except by positive action of the Board upon the recommendation of the President, which shall include documentation of compliance with all tenure review and recommendation procedures stated in Appendix A of [UT Policy BT0006](#) and as established under [Section 3.10.7](#) of this Handbook. The Board will grant tenure upon initial appointment only if (1) the proposed appointee holds tenure at another higher education institution and the Board determines that the President has documented that the proposed appointee cannot be successfully recruited to UTC without being granted tenure upon initial appointment; or (2) the Board determines that the President has documented other exceptional circumstances warranting the grant of tenure upon initial appointment. When necessary between regular meetings of the Board, the Board's executive committee may act on behalf of the Board to grant tenure upon initial appointment in accordance with the provisions of this [Section 3.10.3](#).²⁷

3.10.4. Criteria for Tenure Consideration

The criteria for appointment and reappointment reflect the basic elements for tenure consideration; however, a positive recommendation for tenure requires demonstrated excellence in performance. Expectations necessarily vary within the respective disciplines of faculty members and in light of the differing ranks of faculty members. The natures of disciplines are such that they emphasize differing levels of performance and differing mixes and types of research and service. Consequently, the tenured faculty members in the disciplines in which tenure-track faculty members work will

recommend the standards, degrees of emphasis, and the appropriate types of research and service required for tenure. The individual standards and criteria for tenure for each academic department must be explicitly laid out in the bylaws of the academic department.

A faculty member, at a minimum, must meet the following criteria necessary for the rank of Associate Professor in order to be granted tenure:

1. have a doctorate degree or other terminal degree in his or her discipline or present equivalent training and experience;
2. have achieved a reputation as an accomplished teacher;²⁸

²⁶ See Section III.C. of [UT Policy BT0006](#).

²⁷ See Section III.D. of [UT Policy BT0006](#).

²⁸ In regard to evaluation of librarians, "librarian" should be substituted for the word "teacher".

3. have achieved a good record in research, scholarly, or creative activities;
4. have an established record of effective participation in professional activities other than teaching and research;
5. have demonstrated ability to relate appropriately to students and professional colleagues; and
6. have demonstrated excellence in at least one of the three areas of responsibility (i.e., teaching, service, and research) required for full-time faculty status.

An academic department shall establish more specific criteria for tenure in that academic department that are consistent with the tenure criteria stated in [UT Policy BT0006](#) and this Handbook but may be more restrictive. Departmental criteria for tenure shall be effective upon approval of the dean and Provost and shall be published in the bylaws of the department. Departmental criteria for tenure shall not be required, however, if more-specific criteria have been established by the applicable college, and the dean and Provost have approved application of the college criteria in lieu of departmental criteria.

3.10.5. Tenure Dossier

All tenure candidates must prepare and submit a tenure dossier, which will be reviewed and inform the recommendations made at each stage of the tenure review process. The dossier is standard to the extent that it describes the way in which the candidate has met each of the respective criteria for tenure as listed in this Handbook. The departmental bylaws shall contain a statement of the required contents of the tenure dossier that is consistent with the Faculty Handbook and with applicable college bylaws, unless the dean and the Provost have approved the department's application of tenure dossier requirements established in college bylaws.

The dossier should include a preface that must contain a Curriculum Vita (CV) describing the candidate's education and experience (both prior to coming to UTC and while at UTC) and a one-page executive summary of the same. In addition, the preface to the dossier may contain a summary of the candidate's EDO evaluations. The dossier should be divided into the three distinct components based on the three performance areas outlined in the EDO: (1) teaching and advising; (2) research,

scholarship and creative activities; and (3) professional service to the University, profession, and community. The respective components of the dossier should include all documentation for and evidence of activities related to, respectively, the teaching, research, and service in which the candidate has engaged since the candidate's initial appointment at UTC. A teaching philosophy and a record of Student Ratings of Faculty for the candidate must be included in the dossier. Other materials should be included at the discretion of the candidate, and, if possible, on the advice of the departmental RTP Committee. The departmental bylaws shall set forth information pertaining to appropriate activities of faculty members in the academic department for each of the three areas of professional responsibility.

3.10.6. Requirement for Peer Review Teaching and External Reviews

1. Peer Review of Teaching

Tenure candidates who engage in teaching will be subject to a peer review of their teaching performance as part of the tenure review process. Each academic department will establish procedures for conducting teaching peer reviews for the tenure review process and publish such procedures in its bylaws. Departmental procedures for teaching peer reviews are not required, however, if the dean and the Provost have approved application of college-wide teaching peer review procedures in lieu of departmental procedures. College-wide teaching peer review procedures approved by the dean and Provost will be published in the college bylaws.

2. External Reviews

All dossiers for tenure/promotion must include reviews from no fewer than two (2) external reviewers. Each college or academic department will establish an external review process, which will incorporate, at a minimum, the following requirements:

- The external reviewers must be in the same, or a very similar, academic field.
- The external reviewers must be tenured and at, or above, the rank that the candidate seeks.
- The external reviewers must be at a comparable institution.
- The external reviewers must not have a current conflict of interest with the candidate.
- The departmental RTP Committee and the candidate shall be jointly responsible for selecting the external reviewers.
- Neither the departmental RTP Committee nor the candidate will be permitted to contact the external reviewers during the review process. However, the external reviewers are permitted to contact the chair of the departmental RTP Committee for procedural clarifications.

Each academic department will publish its external review process in its bylaws. Departmental procedures for external reviews are not required, however, if the dean and the Provost have approved application of college-wide external review procedures in lieu of departmental procedures. College-wide external review procedures approved by the dean and Provost will be published in the college bylaws.

The purpose of the external review is *not* to make a recommendation regarding tenure/promotion but to provide an objective evaluation of the faculty member's record to date. This external review will include the performance area of research and may also include the performance areas of teaching and service, as defined by college and departmental bylaws. It is the responsibility of the faculty member seeking tenure/promotion to demonstrate excellence in applicable areas. Examples of accomplishments or evidence of excellence include: peer-reviewed publications; presentations at major, regional, national, or international conferences; substantial contributions to regional, national or international committees or work groups; and regional and national awards/recognition for teaching, research, and professional contributions. This list is illustrative only, and is not exhaustive. Objective standards of record and of excellence will be defined through college and departmental bylaws.

3.10.7.Procedure for Consideration and Grant of Tenure

A calendar is established annually by the Provost that should be followed during the development of tenure recommendations. The calendar for the tenure review process is available on the UTC Academic Affairs website [here](#).

The candidate will be informed in writing of the progress of his or her tenure candidacy at each stage of the process. The procedure for the consideration and granting of tenure includes the following stages:

1. Submission of Tenure Dossier: The departmental RTP Committee, at its organizational meeting each academic year, will consider a list of candidates for tenure and request tenure dossiers from the candidates. The candidate shall then prepare and submit a tenure dossier to the departmental RTP Committee.
2. RTP Committee's Recommendation: After receiving and reviewing dossiers from each faculty member under consideration for tenure, the departmental RTP Committee (consisting of tenured faculty in the department) holds a preliminary review at which it has an opportunity to request clarifying information from each candidate prior to final consideration and forwarding of recommendations to the department head. The departmental RTP Committee's recommendation is decided upon by majority vote (yes or no) of those committee members present and voting. Votes will be cast anonymously. Abstentions are permitted. A quorum, as specified by departmental bylaws, is required for actions to take place, and the departmental bylaws will specify the minimum number of votes necessary to constitute a positive recommendation. The vote of the departmental RTP Committee is advisory to the department head.

The departmental RTP Committee will forward a written recommendation to the department head, together with records of committee membership, attendance at final discussions, and voting results.

3. Department Head's Recommendation: After making an independent judgment on the tenure candidacy, the department head shall submit his or her recommendation to the dean with a written summary explanation of his or her judgment, with a copy provided to the tenure candidate at the same time. If the department head's recommendation differs from the recommendation of the departmental RTP Committee, the summary must explain the reasons for the differing judgment, and the department head must provide a copy of the summary to the departmental RTP Committee. The departmental RTP Committee may forward a dissenting report to the next level of review, with a copy provided to the tenure candidate at the same time.
4. Dean's Recommendation: All tenure recommendations of the department head, whether positive or

negative, shall be reviewed by the dean. The dean must establish a college-wide committee for review of tenure and promotion recommendations or, if a college-wide committee is not established, some other independent peer review committee in addition to the departmental RTP Committee's review. The recommendation of such a college-wide committee shall be advisory to the dean. After making an independent judgment on the tenure candidacy, the dean shall forward his or her recommendation and a summary explanation for the recommendation to the Provost, with a copy provided to the tenure candidate at the same time.

5. Provost's Recommendation: All tenure recommendations of the dean, whether positive or negative, shall be reviewed by the Provost. After making an independent judgment on the tenure candidacy, the Provost shall forward his or her recommendation and a summary explanation for the recommendation to the Chancellor, with a copy provided to the tenure candidate at the same time.
6. Chancellor's Recommendation: All tenure recommendations of the Provost, whether positive or negative, shall be reviewed by the Chancellor. After making an independent judgment on the tenure candidacy, the Chancellor shall forward only positive recommendations, with a summary explanation for the recommendation, to the President, with a copy provided to the tenure candidate at the same time.
7. President's Action or Recommendation: The President acts only on the Chancellor's positive recommendation for tenure. If the President concurs in the positive recommendation, he or she shall grant tenure if he or she is authorized to do so, and the Chancellor shall give the faculty member written notice of the effective date of tenure. If only the Board is authorized to grant tenure, the President shall submit the recommendation to grant tenure and a summary explanation for the recommendation to the Board. If the President does not concur in the positive recommendation of the Chancellor, the Chancellor shall give the faculty member written notice that tenure will not be granted.
8. Action by the Board when Required: Only the Board is authorized to grant tenure in certain cases specified in Article III.B. of [UT Policy BT0006](#). In those cases, the Board acts only on the President's positive recommendation for tenure. After positive action by the Board to grant tenure, the President shall give the faculty member written notice of the effective date of tenure.

3.10.8. Appeal of Tenure Decisions

A decision not to grant tenure may be appealed by a tenure candidate pursuant to the appeal procedure under [Section 5.3](#), of this Handbook. A tenure candidate may not initiate an appeal until after the candidate receives notification of the Chancellor's recommendation not to grant tenure.

3.10.9. Locus of Tenure

Tenure is granted in a particular academic unit (e.g., department, school) of UTC in a position appropriate to the faculty member's qualifications. Reorganizations that result in the merger or splitting of departments do not affect the tenure or probationary status of the faculty member involved.

If a tenured faculty member voluntarily transfers from one University of Tennessee campus to another, his or her tenured status is not transferred. However, a review by the responsible administrators in consultation with the tenured faculty of the receiving department may result in an immediate recommendation to the President that tenure at the new campus be granted to the transferred individual; on the other hand, a new probationary period in the receiving department may be established. There shall be no involuntary transfer of faculty members between campuses.

Transfers of tenure between departments at UTC do not require the President's approval, but must be approved by the responsible campus administrators in consultation with the tenured faculty of the receiving unit, with notice to the President. In any event, prior to the effective date of the transfer all conditions relating to tenure must be documented and accepted, in writing, by the transferring faculty member. If a non-tenured faculty member transfers from one existing department to another, a new probationary period must be established and documented under the same guidelines that would be followed if the faculty member came from another institution. All conditions relating to the new probationary period must be documented and accepted, in writing, by the transferring faculty member. If a tenured faculty member accepts a part-time faculty position or an administrative position with UTC, neither of which can carry tenure, the faculty member retains tenure in the full-time faculty position he or she vacated.²⁹

3.10.10. Grounds for Termination of Tenure

1. Relinquishment or Forfeiture of Tenure

A tenured faculty member relinquishes tenure upon resignation or retirement from the University.³⁰ A tenured faculty member forfeits tenure upon taking an unauthorized leave of

²⁹ Section III.H. of [UT Policy BT0006](#).

³⁰ Under [UT Policy BT0006](#) and for purposes of this section, the "University" refers to The University of Tennessee System.

absence or failing to resume the duties of his or her position following an approved leave of absence. Forfeiture results in automatic termination of employment. The Provost shall give the faculty member written notice of the forfeiture of tenure and termination of employment.³¹

(1) Resignation

Faculty members who desire to resign should provide written notice to their department head of their intent to resign and their intended resignation date. The department head will forward the resignation notice to the dean. Except as otherwise provided in this section, the dean will accept the resignation in writing and forward it to the Office of Human Resources with a copy to the Provost. Since faculty appointments are made for the academic year, it is expected that faculty members who wish to resign will do so effective at the end of the academic year. In all cases, notification of resignation must be made early enough to allow UTC to cover any of the faculty member's scheduled assignments. If a faculty member seeks to resign before the end of the faculty member's stipulated appointment term, the acceptance of the resignation will not become official until accepted in writing by the Provost (or the Provost's designee).

(2) Retirement

Faculty members who wish to retire are expected to provide written notice to their department head of their intention to retire and date of expected retirement at least three months before the intended retirement date. The department head will forward the retirement notice to the dean, Provost and the Office of Human Resources. There is no mandatory retirement age for faculty members, and under normal circumstances, a faculty member controls the decision to retire. The effective date of retirement for faculty members

on academic year (nine-month) appointments normally will be at the end of the either the Fall or Spring semester.

2. Extraordinary Circumstances

Extraordinary circumstances warranting termination of tenure may involve either financial exigency or academic program discontinuance. In the case of financial exigency, the criteria and procedures outlined in the Board-approved Financial Exigency Plan for UTC shall be followed. In the case of academic program discontinuance, the criteria and procedures outlined in [UT Policy BT0009 - The University of Tennessee Procedural Framework for Academic Program Discontinuance](#) shall be followed, and the termination of tenured faculty may take place only after consultation with the faculty through appropriate committees of the department, the college, and the Faculty Senate. If termination of tenured faculty positions becomes necessary because of financial exigency or academic program discontinuance, the campus administration shall attempt to place each displaced tenured faculty member in another suitable position. This does not require that a faculty member be placed in a position for which he or she is not qualified, that a new position be created where no need exists, or that a faculty member (tenured or non-tenured) in another department be terminated in order to provide a vacancy for a displaced tenured faculty member. The position of any tenured faculty member displaced because of financial exigency or academic program discontinuance shall not be filled within three years, unless the displaced faculty member has been offered reinstatement and a reasonable time in which to accept or decline the offer.³²

A decision to terminate a faculty member due to financial exigency or academic program

³¹ Section III.J.1.a. of [UT Policy BT0006](#).

³² Section III.J.1.b. of [UT Policy BT0006](#).

discontinuance may be appealed by the faculty member pursuant to the appeal procedure under [Section 5.4.4](#). of this Handbook.

3. Adequate Cause

"Adequate Cause" for terminating a tenured faculty member means the following:

- (1)** Unsatisfactory Performance in Teaching, Research, or Service, which includes the following and similar types of unsatisfactory performance:
 - (a)** failure to demonstrate professional competence in teaching, research, or service;
 - (b)** failure to perform satisfactorily the duties or responsibilities of the faculty position, including but not limited to failure to comply with a lawful directive of the department head, dean, or Provost with respect to the faculty member's duties or responsibilities;
 - (c)** inability to perform an essential function of the faculty position, given reasonable accommodation, if requested;
 - (d)** loss of professional licensure if licensure is required for the performance of the faculty member's duties;

- (e) with respect to members of the Health Sciences Center faculty, failure to be granted or loss of medical staff membership and privileges at affiliated teaching hospitals;
 - (f) loss of appointment (or substantive alteration of the faculty member's work) with an affiliated entity unless approved in advance by the Provost (or designee) (for example, loss of employment with an affiliated medical practice or loss of "joint faculty" support from Oak Ridge National Laboratory;
 - (g) as specified in Appendix D to [UT Policy BT0006](#), cessation of employment with an external entity/primary employer if tenure was granted contingent upon remaining employed by the external entity/primary employer; or
 - (h) dishonesty or other serious violation of professional ethics or responsibility in teaching, research, or service; or serious violation of professional responsibility in relations with students, employees, or members of the community.
- (2) Misconduct, which includes the following and similar types of misconduct:
- (a) failure or persistent neglect to comply with University policies, procedures, rules, or other regulations, including but not limited to violation of the University's policies against discrimination and harassment;
 - (b) falsification of a University record, including but not limited to information concerning the faculty member's qualifications for a position or promotion;
 - (c) theft or misappropriation of University funds, property, services, or other resources;
 - (d) admission of guilt or conviction of: (i) a felony; or (ii) a non-felony directly related to the fitness of a faculty member to engage in teaching, research, service, or administration; or
 - (e) any misconduct directly related to the fitness of the faculty member to engage in teaching, research, service, or administration.³³

3.10.11. Other Tenure-Related Policies

The following tenure-related matters are established by Board policy:

1. Exception to Policy Requiring Full-Time Status for Eligibility for Tenure³⁴
2. Disciplinary Sanctions Other Than Termination³⁵
3. Termination Procedures for Unsatisfactory Performance in Teaching, Research, or Service³⁶
4. Termination Procedures for Misconduct³⁷

Additionally, University policy regarding the awarding of Emeritus Status is found at [UT Policy HR0102 - Emeritus Status](#).

3.11. PROMOTION

3.11.1.Guidelines for Promotion

Promotion is recognition of promise and a sign of confidence that a faculty member is capable of greater accomplishments and of assuming greater responsibilities within UTC. The policy of UTC is to make promotion decisions objectively, equitably, impartially and strictly on the basis of merit.

At UTC, promotion is usually tied to tenure for tenure-track faculty members, as application for tenure is usually linked to application for promotion from the rank of Assistant Professor to the rank of Associate Professor. A tenure-track faculty member at the rank of Assistant Professor must be granted tenure in order to be promoted to the rank of Associate Professor. A tenure-track faculty member initially appointed at the rank of Associate Professor or higher may be granted tenure without receiving a promotion.

Faculty members who wish to be promoted should meet the expectations of the new rank as outlined in the criteria for appointment to rank. In regard to librarian faculty, "librarian" should be substituted for the word "teacher."

3.11.2.Procedure for Promotion Review

A calendar is established annually by the Provost that should be followed during the development of promotion recommendations. The calendar for the promotion process is available on the UTC Academic Affairs webpage [here](#).

The procedure for consideration of and awarding promotion includes the following stages:

1. Submission of Promotion Dossier: The candidate prepares and submits a promotion dossier to the departmental RTP Committee. Similar to tenure dossiers, all promotion dossiers must

³³ Section III.J.1.c. of [UT Policy BT0006](#).

³⁴ See Appendix D of [UT Policy BT0006](#).

³⁵ See Section III.K. of [UT Policy BT0006](#) and [Sections 5.4.2.3.](#) and [5.4.2.4.](#) of this Handbook.

³⁶ See Appendix B of [UT Policy BT0006](#) and [Section 5.4.2.1.](#) of this Handbook.

³⁷ See Appendix C of [UT Policy BT0006](#) and [Section 5.4.2.2.](#) of this Handbook.

include reviews from no fewer than two (2) external reviewers pursuant to the external review process established by the college or academic department (see [Section 3.10.4.2.](#) above).

2. RTP Committee's Recommendation: After receiving and reviewing dossiers from each faculty member applying for promotion, the departmental RTP Committee (consisting of faculty already at or higher rank than the rank the candidate seeks) holds a preliminary review at which it has an opportunity to request clarifying information from each candidate prior to final consideration and forwarding of recommendations to the department head. The departmental RTP Committee's recommendation is decided upon by majority vote (yes or no) of those committee members present and voting. Abstentions are permitted. A quorum, as specified by departmental bylaws, is required for actions to take place.

The departmental RTP Committee will forward a written recommendation to the department head, together with records of committee membership, attendance at final discussions, and voting results.

3. Department Head's Recommendation: The department head will make a written recommendation to the dean and inform the candidate in writing of the recommendation.
4. Dean's Recommendation: The dean will make a written recommendation to the Provost and inform the candidate in writing of the recommendation.
5. Provost's Recommendation: The Provost will make a written recommendation to the Chancellor and inform the candidate in writing of the recommendation.
6. Chancellor's Recommendation: The Chancellor reviews all recommendations concerning promotions and recommends those to be approved to the President. The Chancellor will inform the candidate in writing of the recommendation.
7. President's Action: The President reviews proposed faculty member promotions in rank, evaluates the recommendations submitted by the Chancellor, and makes final decisions on awarding promotions. The President informs the Board of the promotions awarded.

3.11.3. Appeal of Promotion Decisions

A decision not to award promotion may be appealed by a promotion candidate pursuant to the appeal procedure under [Section 5.3](#) of this Handbook. A promotion candidate may not initiate an appeal until after the candidate receives notification of the Chancellor's recommendation not to award promotion.

Chapter 4

Non-Tenure-Track Faculty

4.1. SELECTION OF NEW FACULTY FOR NON-TENURE-TRACK APPOINTMENTS

All appointments to non-tenure-track faculty positions, including full-time and part-time appointments, will be made in accordance with departmental and college bylaws and subject to the provisions of this Faculty Handbook.

4.1.1. Authorization to Search

The dean or other appropriate administrator must obtain authorization from the Provost to begin a search for a non-tenure-track faculty position. Factors considered by the Provost in determining whether to authorize a search for a non-tenure-track position include demonstrated need of the academic department's academic program and availability of funds for the position. The non-tenure-track position may be a new position or an existing position that is or is expected to be vacant. The authorization by the Provost of a search for a new or existing non-tenure-track position does not necessarily mean that an appointment will be made to the position.

4.1.2. Commitment to Diversity

UTC is fully committed to diversity in recruitment at all levels. Efforts must be made by the academic department to advertise position vacancies in an effort to obtain a diverse pool of qualified applicants. For each search, the Director of the Office of Equity and Inclusion ("OEI") will be contacted to advise the academic department as to appropriate search procedures that should be followed.³⁸ Prior to an appointment being offered for a position, the Director of the OEI must certify that appropriate search procedures have been followed in the search for the position.

4.1.3. Search Process

A thorough search and careful selection normally should precede any departmental recommendation of appointment to the dean. The department head should consult with the tenured and tenure-track departmental faculty members to develop a plan for the search process. Under normal circumstances, the tenured and tenure-track departmental faculty members or a faculty member search committee should identify the needs of the program, the characteristics needed in a new faculty member, and a timeline of the procedures to be followed in conducting the search and screening candidates. The department head and the tenured and tenure-track departmental faculty members should approve the plan. The tenured and tenure-track departmental faculty members should have the opportunity to help determine the kind of person needed, the search procedure to be followed, the basic pool of candidates, and the persons to be selected for interview, and to provide an assessment of candidates interviewed. At each of these stages, final responsibility for the departmental recommendation rests with the department head.

4.1.4. Certification of English Language Competency

No individual shall be appointed to a teaching position, unless the department head, in consultation with the departmental faculty members, certifies in writing to the Provost that the individual can communicate effectively with students in the English language. Individuals who teach courses that are conducted primarily in a foreign language are exempt.³⁹ The certification form is available on the UTC Academic Affairs website here.

4.1.5. Recommendation to Appoint

A departmental recommendation of appointment for a non-tenure-track position shall be made by the department head to the dean. If the dean agrees with the departmental recommendation, the department head and dean shall forward the recommendation to the Provost. Each recommendation should be accompanied by a full set of the candidate's credentials and any required forms or certifications. Following a departmental decision to recommend an appointment of a candidate to a position, there may be informal discussions concerning rank, salary and other terms of employment between the department head or dean and the candidate. Such discussions serve merely to shape and influence the recommendations of the department head or dean and do not constitute a binding commitment by UTC.

4.1.6. Letter of Appointment

Official notification of appointment is made by letter from the Provost. The letter of appointment must specify:

1. the rank at which the faculty member is being appointed;
2. the faculty member's initial salary and related financial conditions;
3. the faculty member's general duties and expectations; and
4. the duration of the appointment.

Only the letter of appointment from the Provost to the candidate regarding the terms and conditions of the appointment is binding on UTC. Any other representations concerning the terms and conditions of the appointment, whether oral or written, are not authorized by UTC and not binding on UTC.

The faculty member's written acceptance of the letter of appointment, together with execution of normal university employment forms, completes the initial appointment.

4.2. GENERAL APPOINTMENT TERMS AND CONDITIONS

The employment of non-tenure-track faculty is governed by the terms of the appointment letter, applicable provisions of the Faculty Handbook, college and departmental bylaws, and applicable provisions of University policies and procedures. Non-tenure-track faculty members enjoy the same academic freedom as tenured and tenure-track faculty members.

Conditions necessary to perform assigned duties in a professional manner, including such things as appropriate office space, necessary supplies, support services, and equipment will be provided to non-tenure-track faculty members. Departments should have consistent criteria for deciding teaching assignments. Departments should consider the views of non-tenure-track faculty in setting schedules and other issues that impact quality of teaching and working conditions. Opportunities for faculty development, including travel to scholarly meetings, should be provided whenever possible.

Non-tenure-track faculty members may participate in college and/or departmental activities as outlined in college and departmental bylaws. Depending on stipulations of departmental and college bylaws, non-tenure-track faculty members may have the opportunity to participate in departmental, college, and/or

³⁹ See [UT System Policy Concerning English Language Competency of UT Instructional Staff](#).

university governance, including service on university-wide committees and in other assigned positions. Non-tenure-track faculty members may also serve on graduate committees if the dean, Graduate Council, and Dean of the Graduate School, in consultation with the department head, have evaluated and approved their academic credentials.

The level of representation of non-tenure-track faculty on the Faculty Senate is determined by the Faculty Senate and set forth in the [Faculty Senate Bylaws](#).

4.3. REAPPOINTMENT

A non-tenure-track appointment (whatever its duration) may be renewed for a new term pursuant to the reappointment review process described in this section. A non-tenure-track faculty member's reappointment review is combined with his or her annual performance review in the year in which reappointment is under consideration.

The department head is responsible for the careful evaluation of the faculty member in determining whether to recommend reappointment for a new term. Reappointment recommendations will include consideration of available funding and the faculty member's performance. A non-tenure-track appointment may be, by its nature, funding-limited; the compensation amounts for the position may be funded through a grant, contract, or restricted donation, and it may automatically expire when funding lapses.

The department head will make a recommendation regarding reappointment to the dean. The dean will consider the department head's recommendation and make a recommendation regarding reappointment to the Provost. The Provost will consider the recommendation of the dean and make a final decision regarding reappointment.

The Provost shall provide the faculty member notice of his or her decision in writing. If the Provost decides not to reappoint a non-tenure-track faculty member, the Provost, whenever feasible, should give the faculty member at least (a) one month's written notice of termination of the faculty member's employment or (b) salary equivalent to that which would be paid in the event of one month's notice of the termination of the faculty member's employment.

4.4. NON-TENURE-TRACK FACULTY EVALUATION

All faculty holding non-tenure-track appointments will be evaluated annually as appropriate to the particular appointment. The department head will evaluate annually all non-tenure-track faculty members holding Teaching,⁴⁰ Clinical,⁴¹ or Faculty of Practice⁴² appointments within the department. A non-tenure-track faculty member holding a Research⁴³ appointment will be evaluated by the principal investigator(s) of the research grant or contract, or, if the principal investigator(s) are not able to perform the evaluation, by the department head. Each academic department will be responsible for establishing procedures in the departmental bylaws for the regular review of all non-tenure-track faculty members.

The scope of a non-tenure-track faculty member's evaluation will be determined by the assigned duties specified in the faculty member's appointment letter, and the standards for evaluation should be consistent with the relevant standards of performance for teaching, research, and service as defined at

⁴⁰ See [Section 4.7.1](#), below regarding non-tenure-track Teaching appointments.

⁴¹ See [Section 4.7.3](#), below regarding non-tenure-track Clinical appointments.

⁴² See [Section 4.7.4](#), below regarding non-tenure-track Faculty of Practice appointments.

⁴³ See [Section 4.7.2](#), below regarding non-tenure-track Research appointments.

UTC. Reporting of evaluation results should be consistent within the academic department and the college and are subject to the approval of the dean. The records of non-tenure-track faculty member evaluations will be maintained within the academic department and the Faculty Records Office.

4.5. TERMINATION PRIOR TO EXPIRATION OF APPOINTMENT TERM

A non-tenure-track faculty member may be terminated for Adequate Cause prior to the expiration of their appointment term. The definition of Adequate Cause for non-tenure-track faculty is defined in the same manner as it is for tenured faculty members in [Section J.1.c. of UT Policy BT0006](#) and [Section 3.10.10.3](#) of this Handbook. A recommendation to terminate a non-tenure track faculty member for Adequate Cause

may be initiated by the department head or dean. In the event that a department head recommends to the dean and Provost that a non-tenure-track faculty member be terminated for Adequate Cause, the department head and dean shall meet with the faculty member to present the reasons for the recommended termination and to permit the faculty member to respond. If, after this meeting, the dean concludes that Adequate Cause for the termination exists, a recommendation for termination shall be forwarded to the Provost. In the event the dean recommends to the Provost that a non-tenure-track faculty member be terminated for Adequate Cause in the absence of a recommendation from the department head, the dean shall meet with the faculty member to present the reasons for the recommended termination and to permit the faculty member to respond. If, after this meeting, the dean concludes that Adequate Cause for the termination exists, a recommendation for termination shall be forwarded to the Provost. If the Provost agrees with the termination recommendation, the Provost shall inform the faculty member of his or her termination in writing. The Provost shall also notify the faculty member in writing of his or her right to a post-termination hearing under the Tennessee Uniform Administrative Procedures Act (*see* Tenn. Code Ann. § 4-5- 301 *et seq.*).

Non-tenure-track faculty can also be terminated prior to the expiration of their appointment term in the event of Extraordinary Circumstances as defined in [Section J.1.b. of UT Policy BT0006](#) and [Section 3.10.10.2](#) of this Handbook.

4.6. GRIEVANCES AND APPEALS

Non-tenure-track faculty members may exercise the grievance and appeal procedures outlined in [Chapter 5](#) of this Handbook, except for those grievance and appeal procedures that are expressly applicable only to tenured and tenure-track faculty members.

4.7. NON-TENURE-TRACK APPOINTMENTS

4.7.1. Teaching Appointments

UTC may hire non-tenure-track Teaching faculty members for specific teaching assignments; engagement in disciplinary scholarship and/or public or disciplinary service may be added to the terms of employment as outlined by the hiring college or department.

UTC uses the following ranks or titles for Teaching appointments:

Lecturer: This rank is for those who hold the appropriate degree for their discipline (or its professional equivalent) and who are appointed for full or part-time teaching. Teaching appointments at this rank will be made for a definite term of one year or less.

Normally, those holding the rank of Lecturer will:

1. Have a minimum of a master's degree in the teaching discipline, or a master's degree in another discipline along with professional experience in teaching discipline;
2. Have demonstrated ability or potential as a teacher in the discipline;
3. Effectively participate in service activities aligned with the department's needs;
4. Have demonstrated capacity to relate appropriately to students and professional colleagues; and
5. Effectively engage in professional development and/or research activities in cases where college or

departmental bylaws identify these activities as an obligation of the position.

Associate Lecturer: Faculty members who have held Teaching appointments at the rank of Lecturer for four (4) years will be considered for promotion to the rank of Associate Lecturer, although a record of superior performance may justify earlier consideration. Teaching appointments at this rank will be made for a definite term of up to three years.

Normally, those holding the rank of Associate Lecturer will:

1. Have a minimum of a master's degree in the teaching discipline, or a master's degree in another discipline along with professional experience in teaching discipline;
2. Have a record as an accomplished teacher in the discipline;
3. Have an established record of effective service activities aligned with the department's needs;
4. Have demonstrated the ability to relate appropriately to students and professional colleagues; and
5. Have a substantial record of professional development and/or research activities in cases where college or departmental bylaws identify these activities as an obligation of the position.

Senior Lecturer: Faculty members who have held Teaching appointments at the rank of Associate Lecturer for six (6) years will be considered for promotion to the rank of Senior Lecturer. However, a record of extraordinary performance at the Associate Lecturer level may justify earlier consideration. Additionally, those faculty holding Teaching appointments who were hired prior to the creation of the Associate Lecturer position in 2019 will be considered for promotion to Senior Lecturer after ten (10) years of service at any Teaching appointment rank(s). Teaching appointments at this rank will be made for a definite term of up to five years.

Normally, those holding the rank of Senior Lecturer will:

1. Have a minimum of a master's degree in the teaching discipline, or a master's degree in another discipline along with professional experience in teaching discipline;
2. Have a significant record as an accomplished teacher in the discipline;
3. Have an extended record of effective service activities aligned with the department's needs;
4. Have demonstrated a continuing ability to relate appropriately to students and professional colleagues; and
5. Have a substantial record of professional development and/or research activities in cases where college or departmental bylaws identify these activities as an obligation of the position.

Distinguished Lecturer: This rank is for those Senior Lecturers who hold a degree appropriate to their discipline (or its professional equivalent) and who have demonstrated excellence in teaching. Tenured faculty members within the academic department will evaluate and make recommendations for appointments to the rank of Distinguished Lecturer, in accordance with departmental and college bylaws. Ordinarily, this rank is reserved for senior scholars with established national reputations in their discipline. Teaching appointments at this rank will be made for a definite term of up to five years.

All Teaching appointments are renewable subject to availability of funds, satisfactory performance, and staffing needs.

Each academic department shall establish more specific criteria for the appointment/promotion to Teaching ranks within the department, subject to the approval of the dean and Provost. The departmental criteria shall be consistent with, but may be more restrictive than, the criteria outlined in this Faculty Handbook and any criteria established by the college within which the department resides and shall be published in the departmental bylaws. Departmental criteria for appointment/promotion to Teaching ranks shall not be required, however, if more specific criteria have been established by the applicable college, and the dean and Provost have approved application of the college criteria in lieu of departmental criteria. College criteria for appointment/promotion of faculty members to Teaching ranks within the college must be approved by the Provost and published in the college bylaws.

4.7.2. Research Appointments

UTC may hire non-tenure-track Research faculty members to conduct research and ordinarily does not expect them to engage in teaching or perform public or disciplinary service as a condition of their employment. UTC may hire Research faculty members at any time to meet research needs within the various academic programs. Expectations of teaching duties and service may be added to the terms of employment. Research appointments are supported on extramural funding provided by research grants and contracts; therefore, the appointment periods correspond to the available funding.

UTC uses the following ranks or titles for Research appointments:

Research Assistant Professor: This rank is for those who have completed a doctoral degree or terminal degree appropriate to the discipline. Individuals holding such positions demonstrate an ability to initiate independent research and obtain external funding and have demonstrated capacity to relate appropriately to students and professional colleagues.

Research Associate Professor: This rank is for those who have typically held the rank of Research Assistant Professor for four (4) years; have completed a doctoral degree or terminal degree appropriate to the discipline; have a good record of sustained scholarly activity and external financial support; and have demonstrated the ability to relate appropriately to students and professional colleagues. Research Associate Professors have research qualifications and accomplishments consistent with those for appointment at the rank of Associate Professor.⁴⁴

Research Professor: This rank is for those who have typically held the rank of Research Associate Professor for six (6) years; have completed a doctoral degree or terminal degree appropriate to the discipline; have a significant record of sustained, externally funded,

⁴⁴ See [Section 3.2.1.2.](#) of this Handbook regarding criteria for appointment to the rank of Associate Professor.

scholarly activity that has culminated in national and/or international recognition among their peers; and have demonstrated a continuing ability to relate appropriately to students and professional colleagues. Research Professors have demonstrated research qualifications and accomplishments consistent with those for appointment at the rank of Professor.⁴⁵

All Research appointments typically will be made for a definite term of one year or less but may be made for a definite term longer than one year that corresponds to the available extramural funding for the research being conducted. Research appointments may be renewed subject to continued availability of funding, satisfactory performance, and staffing needs.

Each academic department shall establish more specific criteria for the appointment/promotion to Research ranks within the department, subject to the approval of the dean and Provost. The departmental criteria shall be consistent with, but may be more restrictive than, the criteria outlined in this Faculty Handbook and any criteria established by the college within which the department resides and shall be published in the departmental bylaws. Departmental criteria for appointment/promotion to Research ranks shall not be required, however, if more specific criteria have been established by the applicable college, and the dean and Provost have approved application of the college criteria in lieu of departmental criteria. College criteria for appointment/promotion of faculty members to Research ranks within the college must be approved by the Provost and published in the college bylaws.

4.7.3. Clinical Appointments

UTC may hire non-tenure-track Clinical faculty members to perform professional services and to provide instruction to students in a clinical setting. Faculty members holding Clinical appointments generally are not expected to conduct research or perform public or disciplinary service as a condition of their employment. However, expectations of scholarship and service may be added to the terms of employment.

UTC uses the following ranks or titles for Clinical appointments:

Clinical Assistant Professor:⁴⁶ This rank is for those who have completed a doctoral degree or terminal degree appropriate to the discipline and are licensed or certified to practice the profession. Individuals holding such positions demonstrate an ability to teach students in a clinical setting and have a demonstrated ability to relate appropriately to students and professional colleagues. Clinical appointments at this rank will be made for a definite term of up to three years and may be renewed subject to continued availability of funding, satisfactory performance, and staffing needs.

Clinical Associate Professor: This rank is for those who have typically held the rank of Clinical Assistant Professor for four (4) years; have completed a doctoral degree or a terminal degree appropriate to the discipline; are licensed or certified to practice the profession; and have demonstrated the ability to relate appropriately to students and professional colleagues. Individuals holding such positions have demonstrated clinical and teaching abilities consistent with those for appointment at the rank of Associate Professor.⁴⁷ Clinical appointments at this rank will be made for a definite term of up to three years and may be renewed subject to continued availability of funding, satisfactory performance, and staffing needs.

Clinical Professor: This rank is for those who have typically held the rank of Clinical

⁴⁵ See [Section 3.2.1.3](#) of this Handbook regarding criteria for appointment to the rank of Professor.

⁴⁶ Effective August 1, 2018, all non-tenure-track faculty appointments at the rank of Clinical Instructor will be converted to appointments at the rank of Clinical Assistant Professor.

⁴⁷ See [Section 3.2.1.2](#) of this Handbook regarding criteria for appointment to the rank of Associate Professor.

Associate Professor for six (6) years; have completed a doctoral degree or a terminal degree appropriate to the discipline; are licensed or certified to practice the profession; and have demonstrated a continuing ability to relate appropriately to students and professional colleagues. Individuals holding such positions have demonstrated clinical and teaching qualifications and accomplishments consistent with those for appointment at the rank of Professor.⁴⁸ Clinical appointments at this rank will be made for a definite term of up to five years and may be renewed subject to continued availability of funding, satisfactory performance, and staffing needs.

Each academic department shall establish more specific criteria for the appointment/promotion to Clinical ranks within the department, subject to the approval of the dean and Provost. The departmental criteria shall be consistent with, but may be more restrictive than, the criteria outlined in this Faculty Handbook and any criteria established by the college within which the department resides and shall be published in the departmental bylaws. Departmental criteria for appointment/promotion to Clinical ranks shall not be required, however, if more specific criteria have been established by the applicable college, and the dean and Provost have approved application of the college criteria in lieu of departmental criteria. College criteria for appointment/promotion of faculty members to Clinical ranks within the college must be approved by the Provost and published in the college bylaws.

4.7.4. Faculty of Practice Appointments

UTC may hire non-tenure-track Faculty of Practice faculty members to meet instructional and research needs, with the specific intent of bringing practicing professionals into the classroom and research laboratories.

UTC uses the following ranks or titles for Faculty of Practice appointments:

Assistant Professor of Practice:⁴⁹ This rank is for those who have completed a doctoral degree or terminal degree appropriate to the field, are licensed or certified to practice the profession where appropriate, or have substantial professional experience. Individuals holding such positions demonstrate an ability to teach and/or conduct research based on their experience and practice in the profession and have a demonstrated capacity to relate appropriately to students and professional colleagues. Faculty of Practice appointments at this rank will be made for a definite term of up to three years and may be renewed subject to continued availability of funding, satisfactory performance, and staffing needs.

Associate Professor of Practice: This rank is for those who have typically held the rank of Assistant Professor of Practice for four (4) years; have completed a doctoral degree or a terminal degree appropriate to the field, are licensed or certified to practice the profession where appropriate, or have substantial professional experience; and have demonstrated the ability to relate appropriately to students and professional colleagues. Individuals holding such positions have demonstrated practice in the profession and teaching and/or research abilities consistent with those for appointment at the rank of Associate Professor.⁵⁰ Faculty of Practice appointments at this rank will be made for a definite term of up to three years and may be

renewed subject to continued availability of funding, satisfactory performance, and staffing needs.

⁴⁸ See [Section 3.2.1.3.](#) of this Handbook regarding criteria for appointment to the rank of Professor.

⁴⁹ Effective August 1, 2018, all non-tenure-track faculty appointments at the rank of Instructor of Practice will be converted to appointments at the rank of Assistant Professor of Practice.

⁵⁰ See [Section 3.2.1.2.](#) of this Handbook regarding criteria for appointment to the rank of Associate Professor.

Professor of Practice: This rank is for those who have typically held the rank of Associate Professor of Practice for six (6) years; have completed a doctoral degree or a terminal degree appropriate to the field; are licensed or certified to practice the profession where appropriate, or have substantial professional experience; and have demonstrated a continuing ability to relate appropriately to students and professional colleagues. Individuals holding such positions have demonstrated practice in the professional and teaching or research accomplishments consistent with those for appointment at the rank of Professor.⁵¹ Faculty of Practice appointments at this rank will be made for a definite term of up to five years and may be renewed subject to continued availability of funding, satisfactory performance, and staffing needs.

Each academic department shall establish more specific criteria for the appointment/promotion to Faculty of Practice ranks within the department, subject to the approval of the dean and Provost. The departmental criteria shall be consistent with, but may be more restrictive than, the criteria outlined in this Faculty Handbook and any criteria established by the college within which the department resides and shall be published in the departmental bylaws. Departmental criteria for appointment/promotion to Faculty of Practice ranks shall not be required, however, if more specific criteria have been established by the applicable college, and the dean and Provost have approved application of the college criteria in lieu of departmental criteria. College criteria for appointment/promotion of faculty members to Faculty of Practice ranks within the college must be approved by the Provost and published in the college bylaws.

4.7.5. Adjunct Faculty Appointments

Individuals who provide compensated or uncompensated service to the instructional and/or research programs of UTC on a semester-by-semester basis will receive Adjunct Faculty appointments. Normally the dean, as a designee of the Provost and in consultation with the department head, will issue letters of appointment to Adjunct Faculty members listing their specific duties and compensation. In coordination with the Provost, each dean will be responsible for developing protocols appropriate to the college in order to insure consistency in Adjunct Faculty appointments.

Exempt employees of UTC may receive an Adjunct Faculty appointment in an academic department other than the employee's primary appointment. Such arrangements must be approved by the employee's supervisor and must not conflict with the execution of his or her primary duties.

All Adjunct Faculty members who teach must hold the appropriate degree required for teaching within the academic discipline. Adjunct Faculty members may supervise clinical experiences or assume other responsibilities within the guidelines set forth in university, college, and departmental policies. Individuals with Adjunct Faculty appointments are not eligible for tenure.

4.7.6. Visiting Faculty Appointments

Academic programs may invite Visiting Faculty members to teach, participate in scholarly work, or both within the program. The Visiting Faculty member shall have the professional credentials and level of education required of faculty members in the academic program.

Visiting Faculty members do not participate in the governance of the academic department. A Visiting Faculty appointment is typically for an academic year but may be extended upon recommendation of the department head and dean. One-year Visiting Faculty members are not subject to annual performance reviews. The Provost will issue letters of appointment to Visiting

⁵¹ See [Section 3.2.1.3.](#) of this Handbook regarding criteria for appointment to the rank of Professor.

Faculty members. Individuals with Visiting Faculty appointments are not eligible for tenure.

4.7.7. Distinguished Scientist Appointments

Distinguished Scientist appointments may be awarded to individuals who contribute significantly to nationally and internationally recognized research (e.g., scientists employed at Oak Ridge National Laboratory). The salary of an individual appointed as such is paid by the individual's primary employer, not UTC. A Distinguished Scientist appointment is typically for one year but may be extended by the Provost upon recommendation of the department head and dean. One-year Distinguished Scientist faculty members are not subject to annual performance reviews. The Provost will issue letters of appointment to Distinguished Scientist faculty members. Individuals with Distinguished Scientist appointments are not eligible for tenure.

4.7.8. Intercampus Academic Appointments

Intercampus Academic appointments are sometimes authorized when it appears that a faculty member at one campus has expertise that qualifies him/her for participation in the work of an academic department on another campus, and when the academic department has need for his/her services. The definition and extent of such intercampus participation is determined by mutual agreement between the faculty member and the respective department heads, deans and Provosts involved. In these cases, the following guidelines are observed:

1. The appointment is normally without salary or tenure in the cooperating academic department awarding the intercampus appointment; tenure (if any) and salary continue to be linked with the faculty member's home academic department (i.e., the department from which the visiting faculty member is coming).
2. The department head of the home academic department recommends the intercampus appointment to the department head of the cooperating academic department following information discussion or negotiation.
3. The appointment is made by the cooperating academic department subject to the approval of the dean, Provost, and Chancellor.
4. The title of the faculty member in the cooperating academic department is determined by mutual agreement between the department head and the faculty member, subject to the approval of the dean and Provost.

4.8. PROMOTION

4.8.1. Guidelines for Promotion

Promotion is a recognition of promise and a sign of confidence that a faculty member is capable of greater accomplishments and of assuming greater responsibilities within UTC. The policy of UTC is to make promotion decisions objectively, equitably, impartially and strictly on the basis of merit. Faculty members holding non-tenure-track appointments eligible for promotion who wish to be promoted to a higher rank must meet the criteria for appointment to the higher rank outlined in this Faculty Handbook and in college and departmental bylaws. Promotion criteria should be weighted in relation to a faculty member's assigned responsibilities.

4.8.2. Promotion Review Procedures

Each department shall establish procedures governing the review and consideration of applications for promotion by non-tenure-track faculty that are consistent with the procedures established in this Faculty Handbook and college bylaws, but which may be more restrictive. Departmental procedures shall be effective upon approval by the dean and the Provost and shall be published in the bylaws of the department. Departmental shall not be required, however, if the dean and the Provost have approved application of procedures established in college bylaws in lieu of departmental procedures.

A calendar is established annually by the Provost that should be followed for the review and consideration of applications for promotion by non-tenure-track faculty. The calendar for the promotion review process is available on the UTC Academic Affairs website [here](#).

The procedure for consideration of and awarding promotion includes, at a minimum, the following stages:

1. Submission of Promotion Dossier. The candidate must compile and submit to their department head a promotion dossier to initiate the promotion review process. Specific departmental and/or college requirements for promotion dossiers should be published in departmental and/or college bylaws. At a minimum, promotion dossiers must include:
 - A cover letter from the candidate that includes a request for consideration for promotion, an explanation of the candidate's rank and responsibilities, and a summary of the candidate's record as it relates to the criteria for promotion to the desired rank. The letter should also outline the candidate's contributions in each applicable performance area of responsibility (e.g., teaching/advising/librarianship; research/scholarly activities; and/or service) based on the candidate's assigned responsibilities and annual objectives and the criteria for appointment to the desired rank.
 - A complete, up-to-date curriculum vitae.
 - All annual performance evaluations of the candidate at the candidate's current rank.
 - Documentation of the candidate's contributions in each applicable performance area of responsibility (e.g., teaching / advising / librarianship; research / scholarly activities; and/or service)

based on candidate's assigned responsibilities and annual objectives and the criteria for appointment to the desired rank.

2. Department Head's Recommendation. After making an independent judgment on the promotion candidacy, the department head will make a written recommendation to the dean and inform the candidate in writing of the recommendation. A department may elect to require that a departmental committee consisting of departmental tenured faculty, tenure-track faculty and/or non-tenure-track faculty at or above the rank desired by the candidate, perform an initial evaluation of the promotion application and provide a recommendation to the department head before the department head submits a recommendation to the dean. To the extent a department elects to do so, the department must include such a requirement in its departmental bylaws.
3. Dean's Recommendation. After reviewing the department head's recommendation and making an independent judgment on the promotion candidacy, the dean will make a written recommendation to the Provost and inform the candidate in writing of the recommendation.
4. Provost's Decision. After reviewing the dean's recommendation and making an independent judgment on the promotion candidacy, the Provost will decide whether or not the candidate will be promoted.

4.8.3. Appeal of Promotion Decisions

A decision by the Provost not to award promotion may be appealed by a promotion candidate pursuant to the appeal procedure under **Section 5.3** of this Faculty Handbook.

Chapter 5

Faculty Discipline, Grievance and Appeal Procedures

5.1. INTRODUCTION

Faculty members are entitled to fair, impartial and honest resolutions of problems that may arise in relation to employment. This chapter outlines principles and procedures designed to promote fair resolutions within a reasonable time period and addresses formal appeals in the sections on general appeals ([Section 5.3.](#) below) and special appeals ([Section 5.4.](#) below). Except as otherwise expressly provided, the disciplinary, grievance, and appeal procedures described in this chapter apply to all tenured, tenure-track, and non-tenure-track faculty.

In all cases, faculty members are entitled to notice regarding the grounds on which an administrative action or decision has been taken. Faculty members are encouraged to first informally bring complaints or grievances to the lowest administrative level at which an adverse recommendation, decision, or action was taken. Additionally, informal grievances may be submitted to the faculty ombudsperson for resolution through mediation. Every effort should be made to expeditiously resolve grievances informally before submitting a formal appeal.

A faculty member may initiate a formal appeal under the applicable general or special appeal procedures outlined in this chapter. A formal appeal must be initiated within the applicable time periods specified in this Handbook or University policy or, if not specified, no more than one year from the date of the adverse recommendation, decision, or action in question.

5.2. FACULTY OMBUDSPERSON

The Chancellor, with the advice and consent of the Faculty Senate Executive Committee, shall select a faculty ombudsperson. It is expected that the ombudsperson will be experienced in both alternative dispute resolution and university faculty affairs (including tenure, promotion, evaluation, dispute resolution, and governance), and he or she shall be responsible for facilitating informal conflict resolution at the request of faculty members. Specifically, the ombudsperson serves as a consultant for faculty members needing advice to resolve problems and may serve as an informal mediator if the faculty member has not started a formal appeal (i.e., general appeal or special appeal).

The faculty ombudsperson is not an advocate for either the faculty or UTC, but rather a supporter of fair practices and mutual respect, fostering probity and timeliness in the administration of campus policies and practices. Subject to the provisions of this Handbook, University policy, and the law, the ombudsperson will be guided by the [International Ombudsman Association Code of Ethics](#). The ombudsperson's responsibilities as set forth in this Handbook do not include grievances initiated by administrators, students, or staff. The ombudsperson is appointed under UTC's human resources policies and procedures and is compensated as described in his or her appointment letter. The Chancellor, with the advice and consent of the Faculty Senate Executive Committee, shall renew the term of the ombudsperson.

5.2.1. Consultant Role

As a consultant, the ombudsperson acts as a resource for information on University policies, the faculty member's rights and responsibilities, and procedures of appeal and due process. The ombudsperson helps faculty members decide how best to solve problems early and generally at the lowest levels. If the faculty member has initiated a formal appeal through a formal appeal process, he or she may continue to consult the ombudsperson for a neutral opinion and advice, but the ombudsperson is not permitted to participate actively in formal appeals. Except as required by law or University policy, consultations with the ombudsperson shall not be communicated to a third party unless the faculty member gives his or her permission or the faculty member brings an administrative complaint or legal action against the University or another University employee. For purposes of this [Section 5.2.1.](#) and [Section 5.2.2.](#) below, the term "administrative complaint" refers to a complaint filed with an administrative agency outside of the University such as the Equal Employment Opportunity Commission, the Tennessee Human Rights Commission, and the Office for Civil Rights within the Department of Education.

5.2.2. Mediator Role

As an informal mediator, the ombudsperson serves as a communication channel and dispute resolution facilitator. As used in this context, informal mediation is a flexible concept that may involve investigation by the ombudsperson and direct participation in the conflict resolution as well as the more traditional role of facilitating communication and conflict resolution. The ombudsperson's mediation services do not supersede or replace appeals through the formal appeal processes, but they may be used before those processes are initiated. The ombudsperson is independent of both the faculty member and the administration. If a faculty member requests informal mediation by the ombudsperson, the ombudsperson has sole discretion as to whether a complaint warrants mediation and as to the manner in which any investigation and mediation is to be conducted. Mediation by the ombudsperson should involve only those employees or others with a need to be involved in either providing information or reaching a resolution. Except as required by law, the ombudsperson will not communicate with individuals not involved in the mediation process unless the faculty member gives his or her permission or the faculty member brings an administrative complaint or legal action against the University or another University employee.

The ombudsperson is not permitted to:

- (1) address matters subject to a special appeal procedure described in [Section 5.4.](#) below;
- (2) provide legal advice;
- (3) assist in problems that are unrelated to the University; or
- (4) represent a faculty member in a formal appeal procedure or hearing.

The ombudsperson does not make binding decisions for the University or overrule administrative decisions. Rather, the ombudsperson makes recommendations based upon his or her understanding of the situation, University policies and procedures, experience, and sense of fairness.

5.2.3. Relationship with the Faculty Senate

The Faculty Senate shall provide ongoing advice and assistance for the ombudsperson on the rules and policies applicable to University faculty. The ombudsperson shall issue a report to the Faculty Senate once each year on (a) the number of faculty members served; (b) the types of matters handled; (c) any recommended change to University or faculty rules or policies and the basis for the recommended change; and (d) any other matters that the ombudsperson or the Faculty Senate shall deem necessary or advisable in connection with their respective roles in faculty support and governance. The annual report of the ombudsperson shall not disclose any information that the ombudsperson is required to keep confidential in accordance with this section or ombudsperson best practices.

5.3. PROCEDURE FOR GENERAL APPEALS

5.3.1. Appeal Through the Administrative Channel

Except for the types of grievances for which a faculty member must pursue a formal appeal under a special appeal procedure described under [Section 5.4.](#) below, a faculty member may pursue a formal appeal through the administrative channel. The administrative channel through which an appeal may progress includes: the department head of the department to which the faculty member belongs; the dean of the college to which the faculty member belongs; the Provost; and the Chancellor. The Chancellor's decision is final.

To initiate an appeal through the administrative channel, the faculty member must write a letter to the administrator at the first administrative level at which a contested recommendation or decision was made within sixty (60) calendar days after receipt of notice of the adverse recommendation or decision. The letter should (a) notify the administrator that an appeal is being made, (b) outline the nature of the appeal, and (c) state the desired action.

Before the sixty-day appeal period runs, the faculty member may submit in writing to the administrator a request for an extension of the appeal period beyond the sixty-day deadline. Upon receipt of the faculty member's request, the administrator, for good cause, may extend the appeal period for a reasonable amount of time as determined by the administrator, and in such case, the administrator shall provide written notice to the faculty member of the granted extension of time to appeal.

If the appeal is not resolved to the faculty member's satisfaction at the first administrative level at which the contested recommendation or decision was made, the faculty member may pursue the appeal through each succeeding administrative level. Upon receipt of a negative decision by an administrator at one level, the faculty member will have ten (10) calendar days to appeal in writing to the next administrative level. At each level, the administrator ideally should inform the faculty member of his or her decision in writing within thirty (30) calendar days of receipt of the appeal.

5.3.2. Review by the Faculty Administrative Relations Committee

Except as otherwise provided in this chapter, when a faculty member who has initiated a formal appeal through the administrative channel procedure receives a negative decision by the Provost, the faculty member may appeal the Provost's decision to the Chancellor directly or request review by

the Faculty Administrative Relations Committee ("FARC") prior to the Chancellor's review as provided under [Section 5.5.2](#), below. The faculty member will have ten (10) calendar days after receipt of the Provost's decision to request a FARC review.

5.4. PROCEDURES FOR SPECIAL APPEALS

Special appeal procedures are provided for cases involving the following:

- Complaint of alleged discrimination, unlawful harassment, or violation of the sexual misconduct policy ([Section 5.4.1](#), below);
- Disciplinary sanctions against a tenured faculty member for adequate cause ([Section 5.4.2](#), below);
- Disciplinary sanctions against a non-tenured faculty member for adequate cause ([Section 5.4.3](#), below);
- Termination of a faculty member due to extraordinary circumstances (i.e., financial exigency or academic program discontinuance) ([Section 5.4.4](#), below).

5.4.1. Complaints of Alleged Discrimination or Violation of the Title IX Policy

Complaints that a faculty member has violated a University policy prohibiting discrimination, including but not limited to [UT Policy HR0220 - Equal Employment Opportunity](#), [UT Policy HR0280 - Sexual Harassment & Other Discriminatory Conduct](#), and the [Policy on Sexual Harassment, Sexual Assault, Dating and Domestic Violence, and Stalking](#) ("Title IX Policy"), will be investigated in accordance with the applicable policy. Any disciplinary action taken against a faculty member for violation of the University's anti-discrimination policies and any appeal of such disciplinary action must be in accordance with [Section 5.4.2](#), (tenured faculty) or [Section 5.4.3](#), (non-tenured faculty) below.

5.4.2. Disciplinary Sanctions Against a Tenured Faculty Member for Adequate Cause

1. Termination for Adequate Cause Based on Unsatisfactory Performance in Teaching, Research, or Service⁵²

The following procedures shall apply to termination of a tenured faculty appointment for unsatisfactory performance in teaching, research, or service (see Appendix B to [UT Policy BT0006](#)).

(1) Suspension with Pay or Reassignment Pending Completion of Termination Proceedings

After consultation with the President of the Faculty Senate or the Faculty Senate Executive Committee, the Provost may suspend a faculty member with pay, or change his or her assignment of duties, pending completion of the University's termination proceedings described in this Section 5.4.2.1. The Provost may combine action under this Section 5.4.2.1.(1) with any other procedures under Section 5.4.2.1.

(2) Tenured Faculty's Recommendation

The department head shall direct the tenured departmental faculty to consider the faculty member's performance in teaching, research, and service, and, by an anonymously cast vote taken in accordance with applicable department or college bylaws, to make a recommendation on the question of whether the faculty member's performance constitutes Adequate Cause for termination. The faculty recommendation shall be advisory to the department head. If an Enhanced Post-Tenure Performance Review (EPPR) has been completed in the preceding four years, the report of the EPPR peer committee shall be provided to the tenured faculty, along with any other evaluative information provided for their review. The faculty member under review shall be provided with a copy of the material provided to the tenured faculty and shall be given a reasonable opportunity to submit responsive written materials before the vote of the tenured faculty.

(3) Department Head's Recommendation

The department head shall consider the faculty member's performance in teaching, research, and service, and the recommendation of the tenured departmental faculty, and

⁵² The steps and procedures under [Section 5.4.2.1](#), for the termination of a tenured faculty member for unsatisfactory performance in teaching, research, or service within the definition of Adequate Cause are intended to be consistent with the requirements and procedures set forth under Appendix B of [UT Policy BT0006](#). In the event of any conflict or inconsistency between Board policy and this Faculty Handbook, Board policy will control.

make a recommendation on the question of whether the performance constitutes Adequate Cause for termination. The department head shall forward his or her recommendation and the reasoning supporting the recommendation to the dean, together with the history of efforts to encourage the faculty member to improve his or her performance and a report of the recommendation of the tenured faculty (including the anonymously cast vote tally) on the question of whether the faculty member's performance constitutes Adequate Cause for termination.

(4) Dean's Recommendation

The dean shall consider the faculty member's performance in teaching, research, and service, and the recommendation of the tenured departmental faculty and department head, and make a recommendation on the question of whether the performance constitutes Adequate Cause for termination. The dean shall forward his or her recommendation and the reasoning supporting the recommendation to the Provost, together with the recommendations of the tenured faculty and the department head.

(5) Decision by the Provost

(a) Review by the Provost

- (i) If the Provost concludes that Adequate Cause for termination may exist, he or she shall call the faculty member to a meeting to discuss the possibility of a mutually satisfactory resolution of the matter.

- (ii) If a mutually satisfactory resolution is not achieved within thirty (30) calendar days, the Provost shall ask the Faculty Senate (or appropriate committee or Executive Council of the Faculty Senate) to make a recommendation as to whether Adequate Cause for termination exists. The recommendation of the Faculty Senate, along with supporting reasoning, shall be provided to the Provost within thirty (30) calendar days of the request and shall be advisory to the Provost.
- (iii) If the Provost concludes that Adequate Cause does not exist, then the Provost shall provide the faculty member with written notice of the conclusion (with a copy to the dean and the department head), and shall include in the notice any further instructions regarding the matter as may be necessary.

(b) Sanctions Less Than Termination for Adequate Cause

- (i) If the Provost concludes Adequate Cause exists but that a sanction other than termination or suspension without pay should be imposed, then the Provost may impose the lesser sanction. The faculty member may appeal the lesser sanction to the Chancellor, whose decision shall be final and not appealable to the President.
- (ii) If the Provost concludes Adequate Cause exists but that the sanction should be suspension without pay rather than termination, the Provost shall employ the procedures set forth in Section 5.4.2.1.(5)(c) below, all as appropriately tailored to reflect that the proposed sanction is suspension without pay rather than termination. If the faculty member wishes to contest the suspension without pay, the procedures shall be those set forth in Section 5.4.2.1.(7) below, all as appropriately tailored to reflect that the proposed sanction is suspension without pay rather than termination.

(c) Termination for Adequate Cause

(i) Notice of Adequate Cause and Opportunity to Respond

Before deciding that the faculty member's appointment should be terminated for Adequate Cause, the Provost shall give the faculty member written notice, including a statement of the grounds for termination, framed with reasonable particularity, and the opportunity to respond to the stated grounds and the proposed termination in a meeting with the Provost. The faculty member may choose to respond in writing instead of, or in addition to, a meeting with the Provost. Any written response must be submitted to the Provost within ten (10) calendar days of delivery of the written statement of the grounds for termination.

(ii) Notice of Termination

If, after considering any information provided by the faculty member and after consulting with the Chancellor and the President, the Provost concludes that the faculty member's appointment should be terminated for Adequate Cause, the Provost shall provide written notice of termination to the faculty member (1) providing a statement of the grounds for termination, framed with reasonable particularity, and the date on which the termination will become effective unless the faculty member elects to contest the termination in a pre-termination hearing before a hearing tribunal (as provided under Section 5.4.2.1.(7)(a) below); (2) providing

notice of the faculty member's right to contest the proposed termination in a pre-termination hearing before a tribunal, as described under Section 5.4.2.1.(7)(a) below, or in a post-termination hearing conducted under the provisions of the Uniform Administrative Procedures Act; and (3) providing notice that the faculty member has fifteen (15) calendar days after receipt of the written notice to elect in writing to contest the termination and to elect in writing the form of hearing. Selection of one type of hearing waives the opportunity to contest the termination through the other type of hearing. The Provost shall send a copy of the written notice to the Faculty Senate at the same time.

(6) Failure to Contest Termination

If the faculty member does not contest the charge(s) in writing and make the required hearing election within fifteen (15) calendar days after receipt of the written notice described in Section 5.4.2.1.(5)(c)(ii) above, the faculty member shall be terminated, and no appeal of the matter will be heard within the University.

(7) Options to Contest Termination

The rights provided in this Section 5.4.2.1.(7) are in lieu of any other rights of grievance or appeal in this Handbook or any appeal to the President.

(a) Pre-Termination Hearing before a Tribunal and Final Decision by the Chancellor

If the faculty member makes a timely election to contest the charge(s) through a hearing by a University tribunal, the faculty member must confirm in writing the decision to waive the right to a hearing under the Uniform Administrative Procedures Act, and the Chancellor shall ask the Faculty Senate, or a designated committee of the Faculty Senate, to appoint a tribunal within fifteen (15) calendar days and shall notify the faculty member of this action. The matter then shall proceed in accordance with the tribunal procedures described under this Section 5.4.2.1.(7)(a), with the faculty member's termination stayed pending the conclusion of these procedures.

(i) Composition of the Tribunal

The University tribunal shall consist of members of the faculty and the administration. Either the Chancellor or the faculty member may challenge the appointment of a tribunal member on the ground of bias or conflict of interest. A challenge shall be judged by the Faculty Senate, or a designated committee of the Faculty Senate, whose decision on the challenge shall be final and not subject to appeal.

(ii) Notice of hearing

The Chancellor shall give the faculty member written notice of the hearing date at least thirty (30) calendar days in advance. The Chancellor shall issue a scheduling order to ensure that the tribunal's written findings, reasoning, and conclusions are

submitted to the Chancellor within one hundred twenty (120) calendar days from the date the faculty member has been provided with written notice of termination under Section 5.4.2.1.(5)(c)(ii) above. A scheduling order shall not be modified except by leave of the Chancellor upon a showing of good cause.

(iii) Representation

If the University intends to be represented by legal counsel, the written notice of the hearing date shall so advise the faculty member. The written notice shall also state the faculty member's right to be represented by legal counsel or other representative of his or her choice. If the faculty member intends to be represented by legal counsel, he or she must notify the tribunal chairperson within ten (10) calendar days of receipt of the written notice of the hearing date. If the faculty member fails to give timely notice of legal representation, the hearing date shall be postponed at the University's request.

(iv) Waiver of Hearing

If, at any time prior to the hearing date, the faculty member decides to waive his or her right to a hearing and respond to the charges only in writing, the tribunal shall proceed to evaluate all available evidence and rest its recommendation upon the evidence in the record.

(v) Pre-Hearing Preparation

The faculty member and the University shall have a reasonable opportunity prior to the hearing to obtain witnesses, specific documents, or other specific evidence reasonably related to the charge(s).

(vi) Evidence

The tribunal is not bound by legal rules of evidence and may admit any evidence of probative value in determining the issues. The tribunal shall make every reasonable effort, however, to base its recommendation on the most reliable evidence. If the charge is "failure to demonstrate professional competence in teaching, research, or service," the evidence shall include the testimony of qualified faculty members from UTC and/or other comparable institutions of higher education.

(vii) Confrontation and Cross-Examination of Witnesses

The faculty member and the University shall have the right to confront and cross-examine all witnesses. If a witness cannot or will not appear, but the tribunal determines that his or her testimony is necessary to a fair adjudication of the charge(s), the tribunal may admit as evidence the sworn affidavit of the witness. In that event, the tribunal shall disclose the affidavit to both parties and allow both parties to submit written interrogatories to the witness.

(viii) Adjournments

The tribunal shall grant adjournments to allow either party to investigate evidence

to which a valid claim of surprise is made. The tribunal may grant one such adjournment for a period of no more than five (5) calendar days. If the tribunal wishes to grant an adjournment for more than five (5) calendar days, or wishes to grant more than one adjournment, the tribunal shall notify the Chancellor of the proposed adjournment, provide an explanation of the need for the adjournment, and provide a recommendation regarding the length of the adjournment. If the Chancellor concurs in the tribunal's recommendation that an adjournment be granted, the Chancellor shall give the faculty member written notice of the date on which the hearing will resume.

(ix) Burden of Proof

The burden of proof that Adequate Cause exists rests with the University and shall be satisfied only by clear and convincing evidence in the record considered as a whole.

(x) Findings and Conclusions

The tribunal shall make written findings and conclusions and shall provide a copy to the faculty member at the time of submission to the Chancellor.

- (1) If the tribunal concludes Adequate Cause for termination has not been established, it shall so report to the Chancellor, with supporting reasons. In the case of a split decision, a minority report should be included.
- (2) If the tribunal concludes Adequate Cause for termination has been established but that a sanction other than termination should be imposed, it shall so recommend to the Chancellor, with supporting reasons. In the case of a split decision, a minority report should be included.
- (3) If the tribunal concludes Adequate Cause for termination has been established and that termination is the appropriate sanction, it shall so report to the Chancellor, with supporting reasons. In the case of a split decision, a minority report should be included.

(xi) Transcript of the Hearing

A verbatim record of the hearing shall be made, and a transcript shall be provided to the faculty member and the Chancellor at the time of the tribunal's submission of its findings, reasoning, and conclusions.

(xii) Final Decision by the Chancellor

Upon receipt of the tribunal's findings, reasoning, and conclusions, the Chancellor shall provide an opportunity for written argument by the parties and may provide the parties an opportunity to present oral argument. After considering the tribunal's findings, reasoning, and conclusions and any arguments of the parties, the Chancellor will determine whether Adequate Cause has been established and whether termination is the appropriate sanction.

If the Chancellor concludes that Adequate Cause has not been established, the Chancellor shall provide the faculty member with written notice of the conclusion (with a copy to the tribunal, Provost, dean, and department head), and shall include

in the notice any further instructions regarding the matter as may be necessary.

If the Chancellor concludes that Adequate Cause has been established but that a sanction other than termination should be imposed, including without limitation suspension without pay, the Chancellor may impose the lesser sanction by written notice to the faculty member (with a copy to the tribunal, Provost, dean, and department head). The notice shall include the date on which the sanction will become effective. The decision of the Chancellor shall be final and not appealable to the President.

If the Chancellor concludes that Adequate Cause has been established and that termination is the appropriate sanction, the Chancellor shall provide the faculty member with a written notice of termination stating the grounds for termination (with a copy to the tribunal, Provost, dean, and department head). The notice of termination may include or adopt the written findings and conclusions of the tribunal if applicable to the Chancellor's decision. The notice shall include the date on which termination will become effective. The decision of the Chancellor shall be final and not appealable to the President.

(b) Post-Termination Hearing and Final Decision under the Uniform

Administrative Procedures Act

(i) Contested Case Procedures

If the faculty member makes a timely election to contest the charge(s) under the Uniform Administrative Procedures Act (UAPA), the Chancellor shall appoint an administrative judge, the faculty member's employment will be terminated on the date specified in the notice provided under Section 5.4.2.1.(5)(c)(ii) above, and the matter shall proceed post-termination in accordance with the contested case procedures promulgated by the University under the UAPA. The UAPA contested case procedures are published in the Compiled Rules and Regulations of the State of Tennessee ([Tenn. Comp. R. & Regs. § 1720-01-05-.01 et seq.](#)).

(ii) Initial Order

In accordance with the UAPA contested case procedures, upon completion of the hearing, the administrative judge shall render an initial order, which either party may appeal to the Chancellor within fifteen (15) calendar days. In addition, the Chancellor, on his or her own motion, may elect within fifteen (15) calendar days to review the administrative judge's initial order.

(iii) Final Order

The administrative judge's initial order shall become the final order unless review is sought by either party or the Chancellor within the fifteen-day period. If review is sought, the Chancellor shall review the initial order and issue a final order in accordance with applicable provisions of the UAPA contested case procedures. The final order, whether rendered by the Chancellor or by virtue of neither party

appealing the initial order, shall be the final decision on the charge(s) within the University. If the University's final order is favorable to the faculty member and concludes that the faculty member's employment should not have been terminated for Adequate Cause, then full restitution of salary, academic position and tenure lost during the termination will be made.

(iv) Judicial Review

If the final order is unfavorable to the faculty member, he or she is entitled to judicial review of the final order in accordance with applicable provisions of the UAPA.

2. Termination for Adequate Cause Based on Misconduct⁵³

The following procedures shall apply to termination of a tenured faculty appointment, or termination of a tenure-track appointment before expiration of the annual term, for misconduct within the definition of Adequate Cause (see Appendix C to [UT Policy BT0006](#)).

(1) Suspension or Reassignment Pending Completion of Termination Proceedings

The Provost may combine action under this Section 5.4.2.2.(1) with any other procedures in Section 5.4.2.2.

(a) Suspension with Pay or Reassignment of Duties

After consultation with the President of the Faculty Senate or the Faculty Senate Executive Committee, the Provost may suspend a faculty member with pay, or change his or her assignment of duties, pending completion of the University's termination proceedings described in this Section 5.4.2.2.

(b) Suspension without Pay

After consultation with the Chancellor, the President, and the President of the Faculty Senate or the Faculty Senate Executive Committee, the Provost may suspend a faculty member without pay pending completion of termination proceedings only for the following types of alleged misconduct and only in accordance with the procedures outlined in Section 5.4.2.5. below entitled "Expedited Procedure for Termination or Suspension Without Pay in Certain Cases of Misconduct:"

- (i)** alleged misconduct involving: (1) acts or credible threats of harm to a person or University property; or (2) theft or misappropriation of University funds, property, services, or other resources; or
 - (ii)** indictment by a state or federal grand jury, or arrest and charge pursuant to state or federal criminal procedure, for: (1) a felony; or (2) a non-felony directly related to the fitness of a faculty member to engage in teaching, research, service, or administration.
-

⁵³ The steps and procedures under [Section 5.4.2.2](#) for the termination of a tenured faculty member for misconduct within the definition of Adequate Cause are based on and intended to be consistent with the requirements and procedures set forth under Appendix C of [UT Policy BT0006](#). In the event of any conflict or inconsistency between Board policy and this Faculty Handbook, Board policy will control.

If the University's final determination after either a UAPA proceeding or an ad hoc hearing committee proceeding is favorable to the faculty member and concludes both that the faculty member's employment should not be terminated for Adequate Cause and that the faculty member should not have been suspended without pay pending completion of termination proceedings, then full restitution of salary, academic position and tenure lost during the suspension without pay will be made.

(2) Consultation with Tenured Faculty

The department head shall consult with the departmental tenured faculty before making a recommendation regarding whether a faculty member's alleged misconduct constitutes Adequate Cause for termination.

(3) Department Head's Recommendation

If the department head concludes that a faculty member's alleged misconduct constitutes Adequate Cause for termination, he or she shall forward a recommendation and the reasoning supporting the recommendation to the dean. The recommendation shall include a report of the department head's consultation with the tenured faculty.

(4) Dean's Recommendation

If the dean concludes that a faculty member's alleged misconduct constitutes Adequate Cause for termination, he or she shall forward a recommendation and the reasoning supporting the recommendation to the Provost.

(5) Decision by the Provost

(a) Review by the Provost

- (i)** If the Provost concludes that Adequate Cause for termination may exist, he or she shall call the faculty member to a meeting to discuss the possibility of a mutually satisfactory resolution of the matter.
- (ii)** If the Provost concludes that Adequate Cause does not exist, the Provost shall provide the faculty member with written notice of the conclusion (with a copy to the dean and the department head), and shall include in the notice any further instructions regarding the matter as may be necessary.

(b) Sanctions Less than Termination for Adequate Cause

- (i)** If the Provost concludes that Adequate Cause exists but that a sanction other than termination or suspension without pay should be imposed, the Provost may impose the lesser

sanction. The faculty member may appeal the lesser sanction to the Chancellor, whose decision shall be final and not appealable to the President.

- (ii) If the Provost concludes that Adequate Cause exists but that the sanction should be suspension without pay rather than termination, the Provost shall employ the procedures set forth in Section 5.4.2.2.(5)(c) below, all as appropriately tailored to reflect the proposed sanction is suspension without pay rather than termination. If the faculty member wishes to contest the suspension without pay, the procedure shall be those set forth in Section 5.4.2.2.(7) below, all as appropriately tailored to reflect that the proposed sanction is suspension without pay rather than termination.

(c) Termination for Adequate Cause

- (i) Notice of Adequate Cause and Opportunity to Respond

Before deciding that the faculty member's appointment should be terminated for Adequate Cause, the Provost shall give the faculty member written notice, including a statement of the grounds for termination, framed with reasonable particularity, and the opportunity to respond to the stated grounds and the proposed termination in a meeting with the Provost. The faculty member may choose to respond in writing instead of, or in addition to, a meeting with the Provost. Any written response must be submitted to the Provost within ten (10) calendar days of delivery of the written statement of the grounds for termination.

- (ii) Notice of Termination

If, after considering any information provided by the faculty member and after consulting with the Chancellor and the President, the Provost concludes that the faculty member's appointment should be terminated for Adequate Cause, the Provost shall provide written notice of termination to the faculty member (1) providing a statement of the grounds for termination, framed with reasonable particularity, and the date on which the termination will become effective unless the faculty member elects to contest the termination in a pre-termination hearing before an ad hoc committee (as provided under Section 5.4.2.2.(7)(a) below); (2) providing notice of the faculty member's right to contest the proposed termination in a pre-termination hearing before an ad hoc committee, as described under Section 5.4.2.2.(7)(a) below, or in a post-termination hearing conducted under the provisions of the Uniform Administrative Procedures Act; and (3) providing notice that the faculty member has fifteen (15) calendar days after receipt of the written notice to elect in writing to contest the termination. Selection of one type of hearing waives the opportunity to contest the termination through the other type of hearing. The Provost shall send a copy of the written notice to the Faculty Senate at the same time.

(6) Failure to Contest

If the faculty member does not contest the charge(s) of misconduct in writing within fifteen (15) calendar days after receipt of the written notice described in Section 5.4.2.2.(5)(c)(ii)

above, the faculty member shall be terminated, and no appeal of the matter will be heard within the University.

(7) Options to Contest the Termination

The rights provided in this Section 5.4.2.2.(7) are in lieu of any other rights of grievance or appeal in this Handbook or any appeal to the President.

1. Pre-Termination Hearing before an Ad Hoc Committee and Final Decision by the Chancellor

If the faculty member contests the charge(s) of misconduct but elects to waive his or her right to formal hearing under the contested case procedures of the UAPA, the faculty member must confirm in writing the decision to waive the right to a hearing under the UAPA, and the Chancellor shall appoint an ad hoc hearing committee to conduct an informal hearing on the charges, with the faculty member's termination stayed pending the conclusion of the procedures set forth in this Section 5.4.2.2.(7)(a).

(i) Notice of Hearing

The Chancellor shall give the faculty member written notice of the hearing date at least thirty (30) calendar days in advance. The Chancellor shall issue a scheduling order to ensure that the hearing committee's written findings, reasoning, and conclusions are submitted to the Chancellor within one hundred twenty (120) calendar days from the date the faculty member has been provided with written notice of termination under Section 5.4.2.2.(5)(c)(ii) above. A scheduling order shall not be modified except by leave of the Chancellor upon a showing of good cause.

(ii) Legal Counsel

The faculty member may be represented before the hearing committee by legal counsel or other representative of his or her choice. If the faculty member intends to be represented by legal counsel, he or she must notify the committee chairperson within ten (10) calendar days of receipt of the written notice of the hearing date. If the faculty member fails to give timely notice of legal representation, then the hearing date shall be postponed at the University's request.

(iii) Adjournments

The hearing committee shall grant adjournments to allow either party to investigate evidence to which a valid claim of surprise is made. The hearing committee may grant one such adjournment for a period of no more than five (5) calendar days. If the hearing committee wishes to grant an adjournment for more than five (5) calendar days, or wishes to grant more than one adjournment, the hearing committee shall notify the Chancellor of the proposed adjournment, provide an explanation of the need for the adjournment, and provide a recommendation regarding the length of the adjournment. If the Chancellor concurs in the hearing

committee's recommendation that an adjournment be granted, the Chancellor shall give the faculty member written notice of the date on which the hearing will resume.

(iv) Written Report

The hearing committee shall make a written report of its findings, reasoning, and conclusions to the Chancellor. In the case of a split decision, a minority report should be included.

(v) Final Decision by the Chancellor

Upon receipt of the hearing committee's findings, reasoning, and conclusions, the Chancellor shall provide the opportunity for written argument by the parties and may provide the parties an opportunity to present oral argument. After considering the hearing committee's findings, reasoning, and conclusions and any arguments of the parties, the Chancellor will determine whether Adequate Cause has been established and whether termination is the appropriate sanction.

If the Chancellor concludes that Adequate Cause has not been established, the Chancellor shall provide the faculty member with written notice of the conclusion (with a copy to the hearing committee, Provost, dean, and department head), and shall include in the notice any further instructions regarding the matter as may be necessary.

If the Chancellor concludes that Adequate Cause has been established but that a sanction other than termination should be imposed, including without limitation suspension without pay, the Chancellor may impose the lesser sanction by written notice to the faculty member (with a copy to the hearing committee, Provost, dean, and department head). The notice shall include the date on which the sanction will become effective. The decision of the Chancellor shall be final and not appealable to the President.

If the Chancellor concludes that Adequate Cause has been established and that termination is the appropriate sanction, the Chancellor shall provide the faculty member with a written notice of termination stating the grounds for termination (with a copy to the hearing committee, Provost, dean, and department head). The notice of termination may include or adopt the written findings, reasoning, and conclusions of the hearing committee if applicable to the Chancellor's decision. The notice shall include the date on which termination will become effective. The decision of the Chancellor shall be final and not appealable to the President.

2. Post-Termination Hearing and Final Decision under the Uniform Administrative Procedures Act

(i) Contested Case Procedures

If the faculty member makes a timely election to contest the charge(s) under the Uniform Administrative Procedures Act (UAPA), the Chancellor shall appoint an

administrative judge, the faculty member's employment will be terminated on the date specified in the notice provided under Section 5.4.2.2.(5)(c)(ii) above, and the matter shall proceed post-termination in accordance with the contested case procedures promulgated by the University under the UAPA. The UAPA contested case procedures are published in the Compiled Rules and Regulations of the State of Tennessee ([Tenn. Comp. R. & Regs. § 1720-01-05-.01 et seq.](#)).

(ii) Initial Order

In accordance with the UAPA contested case procedures, upon completion of the hearing, the administrative judge shall render an initial order, which either party may appeal to the Chancellor within fifteen (15) calendar days. In addition, the Chancellor, on his or her own motion, may elect within fifteen (15) calendar days to review the administrative judge's initial order.

(iii) Final Order

The administrative judge's initial order shall become the final order unless review is sought by either party or the Chancellor within the fifteen-day period. If review is sought, the Chancellor shall review the initial order and issue a final order in accordance with applicable provisions of the UAPA contested case procedures. The final order, whether rendered by the Chancellor or by virtue of neither party appealing the initial order, shall be the final decision on the charge(s) within the University. If the University's final order is favorable to the faculty member and concludes that the faculty member's employment should not have been terminated for Adequate Cause, then full restitution of salary, academic position and tenure lost during the termination will be made.

(iv) Judicial Review

If the final order is unfavorable to the faculty member, he or she is entitled to judicial review of the final order in accordance with applicable provisions of the UAPA.

3. Disciplinary Suspension Without Pay for Adequate Cause⁵⁴

Suspension without pay may be imposed as a disciplinary sanction against a tenured faculty member for (1) unsatisfactory performance in teaching, research, or service within the definition of Adequate Cause or (2) misconduct within the definition of Adequate Cause.

If the proposed sanction is suspension without pay for a definite term (no more than one year), the procedures applicable to termination as described in [Section 5.4.2.1.](#) and [Section 5.4.2.2.](#) above (as applicable and as tailored to reflect that the proposed sanction is suspension without pay rather than termination) shall be offered in connection with the suspension.

4. Other Disciplinary Sanctions for Adequate Cause⁵⁵

Disciplinary sanctions that do not involve termination or suspension without pay may be imposed against a tenured faculty member for (1) unsatisfactory performance in teaching, research, or service within the definition of Adequate Cause or (2) misconduct within the

definition of Adequate Cause.

If the proposed sanction does not involve termination or suspension without pay, the following steps will be followed before the sanction is issued:

- (1) The department head shall make a recommendation to the dean.
- (2) The dean shall make a recommendation to the Provost.
- (3) The Provost shall give the faculty member written notice of the proposed sanction and the supporting reason(s) and shall offer him or her an opportunity to respond both in writing and in person.

The faculty member may appeal the proposed sanction through the administrative channel appeal procedure under [Section 5.3.](#) above, except that a decision by the Chancellor on appeal will be the final decision for the University and not appealable to the President. The sanction shall be held in abeyance until conclusion of the appeal.

5. Expedited Procedure for Termination (or Suspension Without Pay) in Certain Cases of Misconduct

(1) Grounds for Termination or Suspension Without Pay

⁵⁴ The steps and procedures under [Section 5.4.2.3.](#) for the suspension without pay of a tenured faculty member for Adequate Cause are based on and intended to be consistent with the requirements and procedures set forth under Section III.K. of [UT Policy BT0006](#). In the event of any conflict or inconsistency between Board policy and this Faculty Handbook, Board policy will control.

⁵⁵ The steps and procedures under [Section 5.4.2.4.](#) for disciplinary suspension with pay or other sanctions of a tenured faculty member for Adequate Cause are based on and intended to be consistent with the requirements and procedures set forth under Section III.K. of [UT Policy BT0006](#). In the event of any conflict or inconsistency between Board policy and this Faculty Handbook, Board policy will control.

In the following cases of alleged misconduct by a tenured faculty member, the Provost, after consulting with the Chancellor, the President, and the President of the Faculty Senate or the Faculty Senate Executive Committee, may invoke an expedited procedure to accomplish termination or suspension without pay, with comprehensive due process procedures to be offered after termination or suspension without pay:

- (1) alleged misconduct (i) involving acts or credible threats of harm to a person or University property, including without limitation, sexual harassment or other sexual misconduct; or (ii) theft or misappropriation of University funds, property, services, or other resources; or
- (2) indictment by a state or federal grand jury, or arrest and charge pursuant to state or federal criminal procedure, for: (i) a felony; or (ii) a non-felony directly related to the fitness of a faculty member to engage in teaching, research, service, or administration.

(2) Procedures Required *Before* Expedited Termination or Suspension Without Pay

Under the expedited procedure, the faculty member shall be offered the following process before termination or suspension without pay:

- (a) notice of the charges;
- (b) an explanation of the evidence; and
- (c) an informal opportunity to refute the charges in a meeting with the Provost.

(3) Procedures Required *After* Expedited Termination or Suspension Without Pay

After termination or suspension without pay, the faculty member shall be offered the full range of due process options in other Adequate Cause proceedings under Section 5.4.2.1. (unsatisfactory performance) and Section 5.4.2.2. (misconduct) above, except that the termination or suspension without pay shall not be stayed pending the outcome of an ad hoc hearing committee if the faculty member elects that method of contesting the action. If the University's final determination after either a UAPA proceeding or an ad hoc hearing committee proceeding is favorable to the faculty member and concludes that the faculty member should not have been suspended without pay or that the faculty member's employment should not have been/should not be terminated for Adequate Cause, then full restitution of salary, academic position and tenure lost during the suspension without pay or termination will be made.

5.4.3. Disciplinary Sanctions Against a Non-Tenured Faculty Member for Adequate Cause

A non-tenured faculty member's employment may be terminated before the end of the faculty member's stipulated appointment term only with the approval of the Chancellor and only for Adequate Cause.

A tenure-track faculty member's employment may be terminated at the end of the faculty member's stipulated appointment term without the required minimum advance notice of non-reappointment,⁵⁶ only with the approval of the Chancellor and only for Adequate Cause.

The following steps and procedures shall apply to disciplinary sanctions against a non-tenured faculty member.

⁵⁶ See [Section 3.7.4.](#) of this Handbook regarding the minimum advance notice required for notice of non-reappointment of a tenure-track faculty member.

1. Termination for Adequate Cause Based on Unsatisfactory Performance in Teaching, Research, or Service

The steps and procedures detailed in [Section 5.4.2.1.](#) above will be followed for the termination of a non-tenured faculty member for unsatisfactory performance within the definition of Adequate Cause before the end of the faculty member's stipulated appointment term. The same steps and procedures will be followed for the termination of a tenure-track faculty member for unsatisfactory performance within the definition of Adequate Cause at the end of the faculty member's stipulated appointment term without the required minimum advance notice of non-reappointment.

2. Termination for Adequate Cause Based on Misconduct

The steps and procedures detailed in [Section 5.4.2.2](#), above will be followed for termination of a non-tenured faculty member for misconduct within the definition of Adequate Cause before the end of the faculty member's stipulated appointment term. The same steps and procedures will be followed for the termination of a tenure-track faculty member for misconduct within the definition of Adequate Cause at the end of the faculty member's stipulated appointment term without the required minimum advance notice of non-reappointment.

3. Disciplinary Suspension Without Pay for Adequate Cause

The steps and procedures detailed in [Section 5.4.2.3](#), above will be followed for disciplinary suspension without pay of a non-tenured faculty member during the faculty member's stipulated appointment term.

4. Other Disciplinary Sanctions for Adequate Cause

The steps and procedures detailed in [Section 5.4.2.4](#), above will be followed for disciplinary sanctions of a non-tenured faculty member during the faculty member's stipulated appointment term which do not involve termination or suspension without pay.

5.4.4. Termination Due to Extraordinary Circumstances (i.e., Financial Exigency or Academic Program Discontinuance)

In the event of the termination of a faculty member due to financial exigency or academic program discontinuation, the faculty member may appeal the decision in writing to the Provost within ten (10) calendar days after receipt of the notice of termination.

Upon receipt of the appeal, the Provost shall convene a Faculty Hearing Committee which shall consist of the Provost, the faculty member's dean and five faculty members elected by the Faculty Senate. The Provost shall chair the Hearing Committee. The Hearing Committee shall ensure a prompt and expeditious hearing that is fair and unbiased although procedural requirements of formal adjudication shall not be required. The Hearing Committee shall evaluate whether established procedures were followed and appropriate criteria applied in arriving at the decision to terminate. The Hearing Committee shall not review the decision concerning the discontinuance of an academic program, the declaration of the financial exigency, or the decisions that led to necessary funding reductions. A recommendation will be sent from the Hearing Committee to the Chancellor to uphold or reverse the action of termination. The Chancellor will make a final decision and notify the faculty member of the decision in writing. The Chancellor's decision may be appealed to the Board.⁵⁷

5.5. APPELLATE REVIEW ROLE OF THE FACULTY ADMINISTRATIVE RELATIONS COMMITTEE

⁵⁷ See UTC Financial Exigency Policies and Procedures.

The Faculty Administrative Relations Committee (FARC) is a standing committee of the Faculty Senate.

The FARC may serve in an appellate review role as provided in this [Section 5.5](#).

5.5.1. Membership

The FARC consists of six faculty members. Two committee members are elected each year for three-year terms by the full faculty in accordance with the [Faculty Senate Bylaws](#). Attendance of three committee members shall constitute a quorum for a FARC meeting. The chairperson of the FARC is elected by the committee members in accordance with the [Faculty Senate Bylaws](#). The chairperson will preside over FARC meetings but shall not vote on a matter unless there is a tie-vote among committee members at a meeting.

5.5.2. Request for a FARC Review

As provided under [Section 5.3.2](#) above, when a faculty member who has initiated a formal appeal through the administrative channel procedure receives a negative decision by the Provost, the faculty member may appeal the Provost's decision to the Chancellor directly or request a review by the FARC prior to the Chancellor's review. The faculty member will have ten (10) calendar days from receipt of the Provost's decision to request a FARC review.

In order to request a review by the FARC, the faculty member must submit a written request to the FARC chairperson, with a copy to the Provost. The faculty member's written request should state the nature of the faculty member's appeal, the status of the appeal, and the faculty member's desired outcome.

If the matter lies within the FARC's purview (as specified in [Section 5.5.3](#) below), the FARC will review the matter. If the matter does not lie within the FARC's purview, the matter will not be reviewed by the FARC, and the faculty member's appeal will continue to the Chancellor for determination.

5.5.3. Purview and Scope of Review

Matters that lie within the purview of the FARC include, but are not limited to, tenure decisions, promotion decisions, non-reappointment decisions, annual performance rating appeals, and allegations of academic freedom violations. Notwithstanding the foregoing, matters that are subject to one of the special appeal procedures set forth under [Section 5.4](#) above lie outside of the FARC's purview and may not be reviewed by the FARC.

For matters submitted to the FARC for review, the FARC does not replace the role of faculty and administrators in making employment-related decisions. Instead, it is guided by the aim of maximizing the protection of the principles of academic freedom, due process, and fairness. Accordingly, for each matter submitted to the FARC for review, the FARC, at a minimum, is obligated to consider whether or not the decision under review was made in accordance with University policies, procedures, and regulations, including, but not limited to, this Handbook and departmental and collegiate bylaws. For example, in reviewing a tenure decision, the FARC, at a minimum, must make a finding and recommendation regarding whether or not the applicable tenure procedures in this Handbook and in collegiate and departmental bylaws were followed. The FARC will gather evidence and make findings and recommendations and provide a report of its findings and recommendations to the Chancellor and the faculty member.

Chapter 6

Benefits and Leaves of Absence

6.1. INTRODUCTION

The University of Tennessee provides a comprehensive program of benefits for faculty members and full-time non-tenure-track faculty members as set forth in UT Human Resources policies and this Faculty Handbook.

UT policies governing benefits and leaves of absence are established in the UT Human Resources policies and may be amended from time to time. The following sections are intended as a general summary of the most important benefits and leaves of absence and are provided for information purposes and do not guarantee that any particular benefit or leave request will be granted. In the event of any conflict or inconsistency between UT Human Resources policies and this Faculty Handbook, the UT Human Resources policies will control.

Certain benefits and leaves of absence are available to both nine-month and twelve-month faculty members. Other benefits and leaves are applicable only to nine-month faculty members. Twelve-month faculty members have certain leave benefits, which are not applicable to nine-month faculty members.

6.2. BENEFITS

The University of Tennessee offers a core employee benefits package with traditional benefits such as health and dental care, life insurance, deferred compensation and retirement plans as well as various leaves of absence, educational assistance, and other benefits, including longevity pay. A summary of benefits that may be available to UTC faculty can be found on the [UTC Office of Human Resources website](#). Benefit availability is based upon employment status as defined in [UT Policy HR0105 - Employment Status](#).

6.3. LEAVES OF ABSENCE

A leave of absence must be requested by a faculty member and approved in advance by the faculty member's department head and/or other administrator as appropriate. Each request for leave must be in writing and specify the length of the leave period. Leaves of absence normally shall not exceed two years and are normally without university compensation. For more information regarding the University's policies on leaves of absence, please see [UT Policy HR0355 - Leave of Absence](#).

Department heads should consult with the UTC Office of Human Resources to be sure a requested leave of absence complies with University policy. For more information regarding obtaining leave approvals and the recording of leave, faculty members should contact the [UTC Office of Human Resources](#). Normally, a faculty member on a leave of absence must complete his or her annual Evaluation and Development by Objectives (EDO) process in the appropriate time frame in order to be eligible for a merit pay increase for that year.

6.3.1. Leave Available to All Regular Full-Time Faculty Members

1. Family and Medical Leave

The University provides for family and medical leave for eligible employees, as appropriate, for childbirth, adoption, foster care placement of a child, serious illness of a spouse, child or parent, or the employee's own serious illness. Family and medical leave requests should be made through the UTC Office of Human Resources. The dean or department head and the Provost will work in consultation with the UTC Office of Human Resources to determine the length of a faculty member's family and medical leave and any work restrictions associated with such leave. For more information regarding family and medical leave, please see [UT Policy HR0338 - Family and Medical Leave](#).

2. Court Leave

Subject to the terms and requirements of [UT Policy HR0315 - Court Leave](#), a faculty member may be granted leave by his or her department head, without loss of pay, to serve as a witness or on a jury in a court or other legal proceeding. A faculty member must provide to his or her department head a copy of the summons or subpoena for jury or witness duty. Court leave must be approved in advance by the department head. Before approving a request for court leave, the department head shall consult with the UTC Human Resources Director to determine whether approval is in accordance with UT Policy HR0315. If the faculty member's absence is expected to create undue hardships in the academic department, the faculty member may wish to respond to the summons or subpoena with a letter requesting that he or she be excused until a later time (stating the hardships that would be caused by an extended absence). Should such a request not be granted by the court, the academic department must make arrangements to cover for the faculty member during his or her absence.

3. Funeral and Bereavement Leave

Faculty members may be granted leave with pay for bereavement and/or to attend the funeral of a close relative. Funeral/bereavement leave must be approved in advance by the department head and the UTC Human Resources Director. For information regarding funeral and bereavement leave, please see [UT Policy HR0340 - Funeral and Bereavement Leave](#).

4. Military Leave

Faculty members may be granted leave for military duty with or without pay. For information regarding leave for military duty, please see [UT Policy HR0370 - Military Leave](#).

5. Educational Leave

UTC may grant leave to regular full-time faculty members, with or without pay, to continue their education and/or participate in research, grants, or fellowships. Educational leave for faculty members must be requested in writing and approved in advance by the Provost and the UTC Human Resources Director. Such approval must specify the length of the leave, which normally should not exceed two years. Each request for leave will be evaluated on its own merits and university approval will depend upon the evidence provided as to the enhancement of the faculty member's value to the University resulting from the leave. Any approved leave extending beyond the current fiscal year is subject to budgetary constraints or funding availability or both. For more information regarding educational leave, please see [UT Policy HR0335 - Educational Leave](#).

6. Personal Leave

A regular full-time faculty member may request leave without pay for personal reasons by making a request in writing to his or her department head. Personal leave is approved or disapproved on an individual basis and predicated on departmental needs and requirements. During a personal leave, the faculty member is always in a leave without pay status.

7. Holidays

The University recognizes the holidays identified under [UT Policy HR0350 - Holidays](#). When a recognized holiday falls on Saturday, it shall be observed on the preceding Friday. When a recognized holiday falls on Sunday, it shall be observed on the following Monday. All regular full-time faculty member employees, as defined under [UT Policy HR0105 - Employment Status](#), qualify for compensation for recognized holidays. More information regarding designated holidays and associated compensation matters can be found under [UT Policy HR0350 - Holidays](#).

6.3.2. Additional Benefits and Leave for Faculty Members on Nine-Month Appointments

1. Annual/Vacation Leave

Faculty members employed on regular full-time academic year (nine-month) appointments do not accrue annual leave under [UT Policy HR0305 - Annual Leave \(Vacation\)](#). However, subject to any Summer semester responsibilities and submitting all reports for the Spring semester, a faculty member on an academic year appointment is considered to be on vacation beginning after the Spring semester Commencement. The faculty member should return back to work at least seven (7) days prior to the first day of the Fall semester in order to give sufficient time to participate in scheduled faculty meetings, committee work, advising and other activities necessary for the satisfactory resumption of the work of the department for the Fall semester. Exceptions on an individual basis may be made by the department head. Faculty members on academic year (nine-month) appointments who are not teaching during the Summer semester are expected to be available during the summer months for communication with their college and departmental faculty colleagues and UTC administrators.

2. Sick Leave

Faculty members employed on regular full-time academic year (nine-month) appointments do not accrue sick leave under [UT Policy HR0380 - Sick Leave](#). However, see [Section 6.3.2.3.](#) below regarding family care policies applicable to nine-month faculty members.

3. Family Care

Certain nine-month faculty members may be eligible for leave or additional benefits under circumstances where: (1) the faculty member has a serious illness or has primary responsibility for the care of a child or an ill or disabled parent, spouse, or other family member; or (2) the faculty member is managing the arrival of a child through birth, adoption, or foster care. Such additional benefits may include modified duty assignments and extending the probationary period for a tenure-track faculty member. For more information regarding benefits and leave related to family care reasons, see the UTC Faculty and Family Care Policy.

4. Summer Semester

Faculty holding regular full-time academic year (nine-month) appointments may teach Summer semester courses and are paid compensation for teaching such courses, unless such courses are "banked" by the faculty member toward extended periods of release in other semesters as provided under [Section 6.3.2.5.](#) below. A nine-month faculty member's total compensation in a year from teaching Summer semester courses may not exceed twenty-five percent (25%) of the faculty member's academic year salary.

The Provost, in consultation with the department head and dean, determines compensation for Summer semester courses. Compensation for a Summer semester course is primarily determined based on the level of student enrollment in the course and the qualifications of the faculty member teaching the course. The amount paid for a Summer semester course in which student enrollment is less than fully subscribed may be less than the amount paid for a course in which student enrollment is fully subscribed. Application of the appropriate percentages of faculty members' full-time effort and pay for teaching Summer semester courses should be consistent among faculty. Colleges, subject to the approval of the Provost, may cap the total amount of compensation paid for teaching Summer semester courses offered within the college.

5. Semester Banking

Semester banking is available to faculty members who hold regular full-time academic year (nine-month) appointments. Subject to the conditions set forth in this section, permission may be granted to substitute Summer semesters of teaching, or to "bank" such semesters, toward extended periods of release from regular duties in other semesters. Acceptable practice also allows a faculty member to teach (without additional compensation) a larger than normal course load during semesters of the academic year in order to bank the additional courses for released time in subsequent semesters.

Such periods of released time are not considered leaves of absence since they represent substitution of one working period for another and do not entail any redirection of the normal duties of the faculty member. Evaluation and approval of a request for a semester banking arrangement is subject to the following conditions and considerations:

- (1) Service for the semester must be performed before the semester may be "banked" toward a period of release from regular duties in subsequent semesters.
- (2) The duties performed during the "banked" semester (e.g., advising, committee work, etc.) must be coextensive with the duties required for the semester from which the faculty member is to be released.
- (3) The needs of the department and college will be a major consideration.
- (4) The financial and educational resources of the department and college must not be jeopardized in order to effect the substitution.
- (5) Credit for "banked" semesters will not result in additional pay at termination of the faculty member's employment.

A request for a semester banking arrangement will be evaluated by the department head, in

consultation with the Office of Human Resources, and the department head will submit his or her recommendation regarding the request to the dean. The request must be approved by the dean.

6.3.3. Additional Benefits and Leave for Faculty Members on Twelve-Month Appointments

1. Annual/Vacation Leave

Faculty members on regular full-time twelve-month appointments accrue annual leave as provided under [UT Policy HR0305 - Annual Leave \(Vacation\)](#).

2. Sick Leave

Faculty members on regular full-time twelve-month appointments accrue sick leave as provided under [UT Policy HR0380 - Sick Leave](#).

3. Family Care

Certain twelve-month faculty members may be eligible for leave or additional benefits under circumstances where: (1) the faculty member has a serious illness or has primary responsibility for the care of a child or an ill or disabled parent, spouse, or other family member; or (2) the faculty member is managing the arrival of a child through birth, adoption, or foster care. Such additional benefits may include modified duty assignments and extending the probationary period for a tenure-track faculty member. For more information regarding benefits and leave related to family care reasons, see the UTC Faculty and Family Care Policy.

6.3.4. Professional Development Leave

1. Eligibility

Full-time tenured faculty members are eligible to apply for professional development leave if they have completed a minimum of six consecutive years of service in a full-time appointment immediately prior to the time the professional development leave is to begin.

2. Application and Approval Procedure

An eligible faculty member interested in applying for professional development leave should submit the [Application For Leave or Faculty Development Grant](#) to his or her department head. The department head will review the application and will make a recommendation to the dean. The dean will review the application and make a recommendation to The Deans Council to the Provost. The Deans Council to the Provost will review annually all applications requesting leave for the following academic year and make recommendations to the Provost. The Provost will make the final decision on each application.

3. General Criteria for Awarding Leave

Professional development leave is awarded on the merits of a faculty member's specific proposal for professional development. The award is an investment by UTC in the expectation that the leave will enhance the faculty member's ability to contribute to the objectives of UTC

and to student development.

The improvements sought during professional development leave should benefit the work of the faculty member, department, college, and university. Only professional development leave proposals that meet this criterion will be accepted and approved by UTC. The purposes for which professional development leave may be granted include:

- (1) research on significant problems and issues;
- (2) important creative or descriptive work in any means of expression;
- (3) post-doctoral study at another institution; and
- (4) other approved projects, including innovations in teaching and learning.

4. Duration of Leave and Compensation

Professional development leave may be granted for either:

- (1) one-half the faculty member's annual appointment period at the faculty member's full base salary rate; or
- (2) the faculty member's full annual appointment period at one-half of the faculty member's full base salary rate.

Compensation shall be paid monthly, unless approved otherwise.

5. Additional Compensation and Benefits

- (1) For the period of a faculty member's professional development leave, the faculty member normally will be permitted to accept only such grants, contracts, awards, fellowships, and other additional compensation as are given to support the approved professional leave project or are consistent with university policies. The approval of the Provost must be obtained prior to accepting any compensation beyond that specified in [Section 6.3.4.4.](#) above. A fellowship, grant-in-aid, or government-sponsored exchange lectureship may be accepted for the period of the leave if acceptance will promote the purpose of the leave and is approved by the Provost.
- (2) If approved by the Provost, a faculty member on leave normally will be permitted to earn compensation from an outside source in accordance with the Policy on Compensated Outside Services set forth in [Chapter 7](#) of this Handbook.
- (3) To the extent permitted by state law, all benefits available to the faculty member under normal service shall be available during professional leave.

Chapter 7

Compensated Outside Services, Ethical Conduct of Faculty, and Intellectual Property

7.1. COMPENSATED OUTSIDE SERVICES POLICY

7.1.1. Purpose

Full-time faculty members agree to devote themselves to UTC's mission of teaching, research, and public service. Fulfillment of these responsibilities demands a full-time, one hundred percent (100%) commitment to a faculty member's regular UTC duties and responsibilities, including the responsibility to remain current in the discipline to which the faculty member is appointed. For many faculty members, an important way to remain current in their disciplines involves testing and applying their academic skills and abilities to real-world problems outside of their regular UTC duties. UTC encourages faculty members to engage in consulting and other related outside services which are associated with the disciplines of their appointments and which develop their professional expertise. By engaging in such outside services, many faculty members improve their disciplinary skills; serve educational institutions, professional organizations, business, industry, and government; and bring positive recognition to UTC.

The purpose of the Compensated Outside Services Policy set forth in this [Section 7.1](#) is to ensure that professional development of the faculty is encouraged and, at the same time, ensure that faculty meet their regular UTC duties and responsibilities in a timely and effective manner.

7.1.2. General Principles and Application

1. This policy has three governing ideas. One is that the faculty development and University "value" of compensated outside services is partly determined within the culture of the academic discipline; thus, rather than having a centralized and unilateral requirement, the responsibility of determining faculty development and University "value" of compensated outside services is delegated to the departmental level. Secondly, as a means of promoting accountability, this policy calls for regular and open communications between the faculty member and his or her department head regarding the faculty member's compensated outside services. Finally, because other faculty activities (teaching, research, service) often are gauged as a percent-of-effort, this policy similarly gauges compensated outside services on a percent-of-effort basis.
2. While compensated outside services may be valuable for both faculty members and UTC, the primary responsibility of faculty members is to fulfill the teaching, research, and service commitments of their full-time appointments to UTC. Faculty members have a responsibility not to undertake external activities that substantially burden or interfere with their commitments to UTC. A full-time appointment includes an obligation to maintain a meaningful presence on behalf of UTC in the performance of responsibilities, including by being accessible on campus to students, staff, and colleagues. Compensated outside services must not result in a conflict of interest or a conflict of commitment with respect to the faculty member's regular UTC duties and responsibilities.
3. Compensated outside services are not part of and cannot be substituted for a faculty member's full-time teaching, research, and service commitments to UTC. Correspondingly, a faculty member's annual performance evaluation is based only on the faculty member's performance of the duties and responsibilities of his or her appointment to UTC.
4. Subject to and consistent with the requirements of this policy, college and departmental bylaws may further define the nature and allowable time commitments of appropriate compensated outside services for faculty members within the college or department. A faculty member's department head and dean are responsible for assessing the value of the faculty member's compensated outside services.
5. The guidelines and requirements of this policy primarily apply to compensated outside services provided by faculty members pursuant to long-term arrangements or continuing/recurring short-term arrangements with outside clients. The guidelines and requirements of this policy do not apply to:

- (1) Compensated outside services provided by faculty members pursuant to non- recurring, short-term arrangements (which are typically not compensated except for modest honoraria), such as participation in symposia, accreditation visits, research paper presentations, exhibitions, or recitals; however, faculty members must notify and secure approval from their department heads in advance of such activities.
 - (2) Compensated outside services provided by faculty members on academic year (nine- month) appointments during the Summer semester term, except as provided under [Section 7.1.3.6.](#) below.
 - (3) Compensated outside services provided by faculty members pursuant to sponsored grants or contracts subject to UT Fiscal Policies on Sponsored Grants and Contracts.⁵⁸
6. This policy shall be construed to be consistent with all other provisions of this Handbook and other University policies, including policies regarding conflicts of interest (see [UT Policy GE0002 - Conflicts of Interest & Commitment](#)), intellectual property (see [Statement of Policy on Patents, Copyrights, and Other Intellectual Property](#)), and academic freedom (see [UT Policy BT0006](#) and [Chapter 2](#) of this Handbook).

7.1.3. Specific Guidelines and Requirements

1. Restriction on Use of University's Name

During the conduct of compensated outside services, faculty members shall not make any use of the name of The University of Tennessee or of any of its constituent institutions (e.g., UTC or any other UT campus or institute) for any purpose other than professional identification; nor may faculty members claim any University or institutional responsibility for the conduct or outcome of such services.

2. Approval to Engage in Compensated Outside Services

Should a faculty member wish to pursue compensated outside services, the faculty member shall submit to his or her department head for approval a Compensated Outside Services Approval Form indicating the proposed plan for such services and the general percent of effort to be allocated to the services in the year ahead. The department head shall review the faculty member's plan as part of the faculty member's annual review and come to an agreement with the faculty member on the plan. If, after the faculty member's plan is approved, the faculty member has an opportunity to pursue a new compensated outside service or if any significant changes to an agreed plan arise before the faculty member's next annual review, the faculty member must notify the department head and submit a new or revised approval form for the department head's approval.

⁵⁸ UT Fiscal Policies on Sponsored Grants and Contracts (UT Policies FI0205 – FI0230) can be found at http://policy.tennessee.edu/fiscal_policy/.

3. Reporting of Compensated Outside Services

As part of a faculty member's annual review, the faculty member must report his or her previous year's allocation of effort regarding compensated outside services on a Compensated Outside Services Certification Form.

4. Use of UTC Resources

Faculty members are not permitted to engage in compensated outside services that involve significant direct expense to UTC or significant use of UTC facilities, equipment, or services, except as permitted in this section. Faculty members who wish to use UTC resources to conduct compensated outside services must enter into a written agreement with UTC specifying the nature of the services to be performed; the kind of resources (equipment, supplies, material, services, etc.) to be used; the extent of use of the UTC resources; and the fee schedules and procedures regarding the compensation to be paid to UTC for the use of the resources. The compensation to be paid to UTC should be the fair market value for such resources, but, at a minimum, it shall not be less than UTC's cost for the resources. The written agreement must be approved in advance by the faculty member's department head, the dean, and the Chief Business Officer.

5. Restrictions on Compensated Outside Services Effort

A faculty member is expected to perform his or her UTC duties and responsibilities during the entire period of the faculty member's appointment term, and such performance of his or her UTC duties and responsibilities comprises the faculty member's total one hundred percent (100%) university effort for the appointment term. Accordingly, for a faculty member holding an academic year (nine-month) appointment, the faculty member's 100% university effort should be for the nine-month term.⁵⁹ For a faculty member holding twelve-month appointment, the faculty member's 100% university effort should be for the twelve-month term.⁶⁰

A faculty member's total compensated outside services efforts should not be more than twenty percent (20%) over his or her total 100% university effort during the faculty member's appointment term. The department head and dean have the discretion to restrict a faculty member's compensated outside service efforts to a percentage less than 20% over the faculty member's total 100% university effort during the appointment term. Such further limitation on a faculty member's compensated outside services efforts is particularly appropriate in cases where the faculty member's performance of his or her assigned UTC duties and responsibilities does not meet expectations for rank, as determined by the annual performance evaluation of the faculty member.

6. Summer Semester Term

A nine-month faculty member who does not have an appointment to perform work for UTC

⁵⁹ In order to determine the faculty member's 100% university effort for the nine-month term, granted released-time taken by the faculty member during the nine-month term should be counted toward the 100% effort. Accordingly, if a faculty member takes one month of granted released-time during the nine-month term, the faculty member's compensated outside services efforts will remain limited to 20% over the faculty member's 100% effort for a nine-month schedule (i.e., the amount of the faculty member's allowable compensated outside efforts will not be decreased for that academic year). For example, in some departments, 20% over a faculty member's 100% university effort normally corresponds to one day per week that the faculty member is allowed to perform compensated outside services. If the faculty member in such a department takes one month of released-time during the nine-month term, the faculty member's compensated outside services will not be limited to less than one day per week; the limitation will remain at one day per week.

⁶⁰ In order to determine the faculty member's 100% university effort for the twelve-month term, annual leave taken and granted released-time taken by the faculty member during the twelve-month term should be counted toward the 100% effort.

during the Summer semester term (e.g., to teach Summer semester courses) is not subject to any quantity restrictions on his or her compensated outside services efforts during the Summer semester term.

A nine-month faculty member who has an appointment to perform work for UTC during the Summer semester term (e.g., to teach Summer semester courses) shall be limited in his or her compensated outside services efforts during the Summer semester term as established by written agreement between the department head and the faculty member.

7. "Extra Services Pay" Activities

Activities for which a faculty member is reimbursed by UTC as "extra services pay" under [UT Policy HR0406 - Compensation](#) may be counted as compensated outside services effort. The total of activities of a faculty member covered by both extra services pay activities and compensated outside services should not be more than twenty percent (20%) over the faculty member's total 100% university effort for his or her appointment term.

8. Non-Compliance

A faculty member's failure to comply with the requirements of this policy and/or applicable college or departmental bylaws with respect to the performance of outside compensated services may be considered as a negative factor during annual reviews, promotion and tenure decisions, salary determinations, and requests for released time or other institutional support. Serious and/or continuing noncompliance also may result in more severe disciplinary action, including, but not limited to, reduction in allowable compensated outside services, salary reduction, restitution for cost of equipment, and termination for adequate cause. A faculty member found to have violated this policy may appeal the finding and any resulting disciplinary action pursuant to the applicable appeal procedures provided in [Chapter 5](#) of this Handbook.

7.2. ETHICAL CONDUCT OF FACULTY

7.2.1. Employee Code of Conduct

In carrying out its educational, research, and public service missions, the University relies on the ethical and responsible conduct of all employees. The University's Employee Code of Conduct under [UT Policy HR0580 - Code of Conduct](#) was developed to supplement and clarify existing University policies, procedures, and rules. Employees are expected to familiarize themselves with the Code and to abide by it.

7.2.2. Conflicts of Interest Policy

The purpose of the Conflicts of Interest Policy is promote the highest standards of objectivity and integrity for its employees and others engaged in carrying out the University's mission in the areas of instruction, research, and public service. All UTC faculty members are subject to and must comply with the Conflicts of Interest Policy set forth under [UT Policy GE0002 - Conflicts of Interest & Commitment](#).

7.2.3. Research and Scholarship Integrity

Public confidence in the integrity of the research and scholarship conducted at the University is

critical to the fulfillment of the University's objectives as a public institution of higher education and is a critical responsibility of individual educators and scholars. Faculty members who engage in research and scholarly activities must familiarize themselves with and abide by [UT Policy RE0001 - Policy and Procedures on Responsible Conduct in Research and Scholarly Activities](#).

7.2.4. Acceptable Use of Information Technology Resources

All faculty members are expected be familiar with and must comply with [UT Policy IT0110 - Acceptable Use of Information Technology Resources](#) relating to their use of University information technology resources.

7.3. INTELLECTUAL PROPERTY POLICY

All faculty members are subject to and must comply with the [UT Policy BT0011 - Statement of Policy on Patents, Copyrights, and Other Intellectual Property](#). The goal of the policy is to promote the progress of science and the arts and the development of the University and faculty. Patents, copyrights, and licensing of intellectual property provide a means for developing and using inventions and creations. The policy was established to ensure that those creative developments in which the University has an equity interest will be used in a manner most likely to benefit the public and at the same time provide compensation to those faculty and staff who invent and create.

Chapter 8

Procedure for Faculty Handbook Revisions

8.1. BOARD OF TRUSTEES POLICY

The Board of Trustees' *Policy on Faculty Handbook Revisions* ([UT Policy BT0007](#)), adopted in 1992, and any subsequent amendments, governs the revision of faculty handbooks. [Section 8.2.](#) below sets out the general procedures to be followed. In the event of any conflict or inconsistency between the Board's policy and this handbook, the Board's policy will control.

8.2. UTC PROCEDURE

The Handbook Committee of the Faculty Senate will initiate proposed revisions to the Faculty Handbook, after consultation with the Provost and campus administration. Each recommendation of the Handbook Committee will be presented at the next meeting of the Faculty Senate as a motion briefly outlining the reason(s) for the proposed revision and specifying the precise change(s) to be made. Adoption of the motion by the Faculty Senate constitutes a recommendation of the Faculty Senate to the Chancellor for revision of the Faculty Handbook.

The Chancellor will submit his or her recommendations, if any, concerning the proposed revision to the chief academic officer for the system. The chief academic officer for the system will submit his or her recommendations, if any, to appropriate vice presidents, the general counsel, and the President.

If the proposed revision involves a substantive change in policy matters as outlined in [UT Policy BT0007](#), the President, in consultation with the vice presidents and the general counsel, will present his or her recommendation concerning the proposed revision, if any, to the Board, or appropriate committee of the Board, if the President determines to go forward with seeking approval for the proposed revision. Final approval of all other proposed revisions of the Handbook lies with the President, in consultation with the vice presidents and the general counsel.

Appendix 4-B

UTC College of Arts & Sciences Bylaws

Preamble

The College of Arts and Sciences (“College”) proudly celebrates and champions liberal education, an approach to teaching and learning that emphasizes a broad and well-rounded course of study in the arts, the humanities, the natural sciences, mathematics, and the behavioral and social sciences. Our College administration and faculty believe that a liberal arts and sciences education prepares students to think critically and creatively, to communicate clearly, and to reflect on complexity, diversity, and change along our social, cultural, technological, and scientific horizons. Such preparation cultivates in our students a sense of personal and social responsibility, intellectual curiosity, and practical skills.

The College aims for excellence in undergraduate and graduate education as its principal mission, a mission that requires quality instruction, research, creative expression, and learning that takes place both inside of and beyond the classroom. As the heart of the University’s rich General Education curriculum, the College is committed to strengthening the intellectual life of all UTC students as they develop an appreciation of the arts, the humanities, the natural sciences, mathematics, and the behavioral and social sciences.

Values

Faculty, staff, and students in the College value a positive work and learning environment as we embrace cultural and intellectual diversity and practice innovative teaching and mentorship. We value offering a foundational education that leads to a life that is enriched by the pursuit of continuous learning. We value and promote scholarly research and creative expression. We value being engaged with the Chattanooga community, as well as our regional and global partners and our ever-expanding intellectual communities.

Mission — Putting our values into practice, we collectively...

- provide and foster an environment for intellectual curiosity and a foundation for life-long learning, thinking, reflection, and growth;
- equip students with transferrable skills – critical thinking, communication, and complex problem-solving skills – that are needed to adapt and succeed in a rapidly evolving world;
- advance cultural and intellectual diversity;
- advance new knowledge through research (theoretical and applied) and creative activities;
- advance integrated service as a part of personal and social responsibility.

Vision

The enduring vision of UTC’s College of Arts and Sciences is to transform lives through a modern liberal arts and sciences education.

Definitions

Throughout the following bylaws, the word “faculty” includes, unless otherwise specified, both tenure-track

faculty (tenured and probationary faculty alike) with tenure homes in the College and non-tenure-track faculty who likewise contribute in both critical and innumerable ways to the mission of the College. The term “voting faculty” is defined in Article III.A of these bylaws.

Bylaws

I College Leadership and Structure

I.A Dean

The Dean administers the College and bears responsibility for the success of its programs.

I.A.1 Responsibilities

The Dean leads development and implementation of the College's strategic plan and ensures alignment with the University's strategic plan; communicates on a regular basis with the faculty and staff through regularly scheduled meetings and communications highlighting the accomplishments of the College faculty and students; manages the budget and fiscal affairs of the College; evaluates performance of Department Heads and staff within the College; reviews recommendations for appointment, retention, tenure, and promotion within the College, and makes subsequent recommendations to the Provost regarding the same; assesses need and advocates for additional resources for the College; and assesses the performance of and recommends changes in academic programs within the College.

I.A.2 Appointment and Evaluation

The Dean serves at the pleasure of the Provost and the Chancellor. The Provost conducts an annual performance evaluation of the Dean.

I.B Associate Dean

An Associate Dean facilitates and implements the objectives set by the Dean, toward the strategic goals of the College, in collaboration with Department Heads and other campus leaders. An Associate Dean is typically an associate or full professor from a department within the College.

I.B.1 Responsibilities

As assigned by the Dean, an Associate Dean may assess and document College progress toward strategic goals; coordinate student success initiatives in the College and within departments; supervise academic scheduling across the College; support reappointment, tenure, and promotion (RTP) work within the College; empanel and chair committees of the College as directed by the Dean; manage provisional College budgets such as those for summer school or part-time faculty; evaluate non-tenure track faculty within the College; chair the College Executive and Tenure and Promotion Committees; and support the work of the College in other capacities as needed.

I.B.2 Appointment and Evaluation

The Dean appoints an Associate Dean through the standard search process used for upper-level campus administrative positions. The Dean appoints a search committee representative of the

College's disciplinary diversity and chaired by a full professor who is tenured within the College. The search committee will solicit applications, seek input from all appropriate College constituencies, and report to the Dean a list of unranked acceptable candidates. The report will be advisory to the Dean, who makes the appointment. The administrative appointment of an Associate Dean, like other administrative offices, does not carry tenure. An Associate Dean serves at the pleasure of the Dean, Provost, and Chancellor. The Dean conducts an annual performance evaluation of an Associate Dean.

I.C Assistant Dean

An Assistant Dean supports the Dean and Associate Deans in facilitating and implementing the objectives set by the Dean, toward the strategic goals of the College in collaboration with Department Heads and other campus leaders. An Assistant Dean is typically an associate or full professor from a department within the College.

I.C.1 Responsibilities

As assigned by the Dean, an Assistant Dean may facilitate and coordinate the administration of the College's graduate programs; represent the College to the Graduate School; work with the Dean and appropriate campus offices in developing communication resources that promote and celebrate the undergraduate and graduate programs in the College; chair the College Curriculum Committee; oversee and coordinate General Education offerings across the College; and support the work of the College in other capacities as needed.

I.C.2 Appointment and Evaluation

The Dean appoints an Assistant Dean through the standard search process used for administrative positions. The Dean appoints a search committee representative of the College's disciplinary diversity and chaired by a full professor who is tenured within the College. The search committee will solicit applications, seek input from all appropriate College constituencies, and report to the Dean a list of unranked acceptable candidates. The report will be advisory to the Dean, who makes the appointment. The administrative appointment of an Assistant Dean, like other administrative offices, does not carry tenure. An Assistant Dean serves at the pleasure of the Dean, Provost, and Chancellor. The Dean conducts an annual performance evaluation of an Assistant Dean.

I.D Department Head

A Department Head is responsible to the Dean and the Faculty within the Department for the administration of the Department.

I.D.1 Responsibilities

The Department Head leads the Department toward development and implementation of the Department's strategic plan, in alignment with the College and University strategic plans; plans and provides for the success of the Department's academic mission; manages responsibly Department budgets and plans for the allocation of departmental resources; evaluates performance of faculty and staff within the Department; reviews recommendations for reappointment, tenure,

and promotion within the Department, and makes subsequent recommendations to the Dean regarding the same; assesses need and advocates for additional resources for the Department; and assesses the performance of and recommends changes in academic programs within the Department.

I.D.2 Appointment and Evaluation

The Dean appoints the Department Head in consultation with the faculty within the Department. That said, the Department Head is not elected, though Department Head searches historically have been conducted by a search committee that includes department faculty and any number of stakeholders, e.g.,

alumni, community and/or business leaders who share interest in the Department's successful leadership, representatives from the Office for Undergraduate Research and Creative Endeavor, representatives from the Office of Research and Sponsored Programs, representatives from the Office of the Vice Chancellor for Research and Dean of the Graduate School, and/or representatives from the Development Office. Search committees ultimately make a recommendation to the Dean on acceptable candidates for the appointment.

After consultation with the Department and its faculty, the Dean selects no fewer than five (5) search committee members from individuals who have been nominated to serve and/or by invitation. Typically, the search for a Department Head is chaired by another Department Head (current or former) from within the College.

The Dean should work to ensure that the Department has representation on the search committee from across the various ranks and divisions within the Department. It is not uncommon for search committee membership to include additional leaders from outside the Department (other Department Heads, graduate program coordinators, and the like) as such a search is for a peer, i.e., another department-level leader who understands the complexities, the nuances, and the demands on individuals who hold such positions.

The administrative appointment of the Department Head, like all other administrative offices, does not carry tenure. The Department Head serves at the pleasure of the Dean, Provost, and Chancellor. The Dean conducts an annual evaluation of the Department Head.

I.E Divisional Structure

The College recognizes that Departments, including departmental faculty and academic programs, may have significant and important interdisciplinary connections, and so categorizes its Departments within divisions, or clusters, of related disciplines. The table below articulates the four divisions within the UTC College of Arts and Sciences.

Division	Departments

Arts	Department of Art
	Department of Performing Arts

Humanities

<i>Natural Sciences and Mathematics</i>	Department of Communication
	Department of English
	Department of History
<i>Behavioral and Social Sciences</i>	Department of Modern and Classical Languages and Literatures
	Department of Philosophy and Religion
	Department of Biology, Geology, and Environmental Science
	Department of Chemistry & Physics
	Department of Mathematics
	Department of Political Science and Public Service
	Department of Psychology
	Department of Social, Cultural, and Justice Studies

The College likewise houses and supports a vibrant Humanities program, the Women's, Gender, and Sexuality Studies program, the Army ROTC Military Science and Leadership program, and numerous, interdisciplinary minors.

II College Governance

II.A College Leadership

II.A.1 Charge

College administrators meet regularly to advance communication and planning. The Department Heads of separate divisions, as described in Section I.E, may meet separately on matters of common interest.

II.A.2 Membership and Meetings (with Department Heads)

College leadership meetings include the Dean, the Dean's administrative staff, any Associate Deans or Assistant Deans, and all Department Heads. The Dean chairs and sets the agendas for all meetings, which are typically twice a month during the fall and spring terms, and then as needed during the summer. The Dean may call additional meetings at her or his discretion. When a Department Head is unable to attend, she or he must designate a departmental representative, e.g. an associate head, to attend as a representative of the respective Department.

II.B Executive Committee

The Executive Committee is an advisory body to the Dean.

II.B.1 Charge

The Executive Committee provides advice and counsel to the Dean on matters of strategic planning and governance. It reviews these bylaws during the spring term of each odd-numbered year and may propose changes which are then subject to approval by the full faculty of the College.

II.B.2 Membership and Meetings

An Associate Dean chairs the Executive Committee. Regular membership consists of two separate representatives from each division of the College, as described in Section I.E. The Dean consults with the Department Heads in each division and then appoints committee members from that division. Members will serve for staggered 3-year terms and at least one academic year must elapse between terms of service.

II.C College Tenure and Promotion (T&P) Committee

The College Tenure and Promotion (T&P) Committee is advisory to the Dean.

II.C.1 Charge

The College T&P Committee reviews and makes recommendations to the Dean regarding candidates for tenure and promotion within the College. The College T&P Committee uses the

UTC Faculty Handbook, these College bylaws, and bylaws from the relevant Department to review recommendations for faculty tenure and promotion forwarded by departmental RTP committees within the College and thereby recommended to the Dean by the relevant Department Head. The College T&P Committee's purview extends to the areas of fairness and high standards.

II.C.2 Membership and Meetings

An Associate Dean chairs the College T&P Committee and serves as a non-voting member of this group. Regular membership consists of two representatives from each division of the College, as described in Section I.E. The Dean consults with the Department Heads in a division and then appoints the committee members from that division. Excepting the chair, who may serve as often as appointed by the Dean, a term of an appointment to the College T&P Committee is two academic years.

In the event that an Associate Dean, as chair of the College T&P Committee, is him/herself a candidate for promotion, another Associate Dean or an Assistant Dean shall serve as a proxy, convene the College T&P Committee, ensure that proper procedures are followed in discussing the candidate's dossier and supporting materials, and oversee the vote on the candidate's promotion. The proxy, as chair of the College T&P Committee, will serve as a non-voting member.

II.C.3 Confidentiality

It is imperative that the chair (i.e., an Associate or Assistant Dean) and all members of the College T&P Committee maintain strict confidentiality on matters discussed in College T&P Committee meetings. Only the chair of the College T&P Committee shall make a recommendation on a candidate's tenure and/or promotion to the Dean. Otherwise, all matters that are discussed in meetings of the College T&P Committee remain strictly confidential.

II.C.4 Split Vote

In cases of a split vote, the Dean may reconvene the College T&P Committee to ensure high standards and fairness are upheld.

II.D Curriculum Committee

The Curriculum Committee reviews curriculum proposals originating from departments within the College.

II.D.1 Charge

The Curriculum Committee reviews all curriculum proposals from departments within the College, upholds high academic standards, and ensures coherence amongst disciplines.

II.D.2 Membership and Meetings

An Assistant Dean chairs the Curriculum Committee, and the regular membership consists of two representatives from each division of the College, as described in Section I.E. Excepting the chair, who may serve as often as appointed by the Dean, a term of an appointment to the Curriculum

Committee is two academic years.

II.E CAS Diversity Committee

II.E.1 Charge

The CAS Diversity Committee assists the Dean and departments with the development and review of the diversity goals and strategies of the College and the University.

II.E.2 Membership and Meetings

The chair of the College Diversity Committee is elected from among the committee's membership. The committee consists of eight members, with representatives from each division of the College, as described in I.E. Members may be nominated by their Department Head and shall be selected by the Dean (or her or his designee). Both faculty and staff are eligible for membership.

Members shall serve terms of two years and membership shall be staggered to ensure rotation amongst the membership. No member of the Committee may serve more than four consecutive years. An Associate or Assistant Dean designated by the Dean may serve as an ex officio member of the Committee. The CAS Diversity Committee will meet at least once each semester.

III Faculty Rights & Responsibilities

As members of the larger University, the faculty of the College enjoy certain rights and responsibilities with respect to academic freedom, freedom of expression, tenure, equity and diversity, and ethics. The College expects all tenured and tenure-track faculty members to make significant contributions to a) teaching and corollary activities that include advisement and mentorship of our students; b) research, scholarship, and creative activity; and c) service to the College, University, public, and profession. It is recognized that individual contributions may not be equal in these three areas. Accordingly, more limited achievement in one area may be offset by excellence in the other two areas. Any such differentiation among the three dimensions of faculty participation must be consistent with the commitment of the University and its mission. Successful faculty members will share that commitment. These bylaws neither expand nor abridge the rights and responsibilities of faculty, as outlined in the UTC Faculty Handbook.

III.A Definition of Voting Faculty Members

The College defines a voting faculty member (in matters related to College governance) as a full-time faculty member whose home Department resides within the College.

III.B Rights

Within the College, voting faculty members may participate in discussions about governance (including these bylaws), serve on College committees, and vote on ballots held within the College. Departmental bylaws provide detail about specific voting faculty member rights within each Department.

III.C Responsibilities

The College expects a tenured and tenure-track faculty member to contribute in each of the following three areas, according to her or his assignment: teaching and advising; research, scholarship, and/or creative activity; and service to Department, College, University, public (as such service relates to a faculty member's discipline or area of expertise), and/or the profession. Non-tenure track faculty members are likewise expected to contribute to the missions of the Department, College, and University.

III.D Teaching and Variable Work Assignments

Because of great diversity among our departments and units within the College, it is not feasible to specify precise College guidelines to be used in determining teaching responsibilities. However, both departmental bylaws and practice should be consistent with these general College guidelines.

Teaching responsibilities may vary among tenured and tenure-track faculty within each Department, and teaching responsibilities may change over time for individual faculty as their contributions to research, scholarship, creative activity, and service vary. As such, differential

work assignments may be required. Factors to be considered in differentiated teaching assignments include: external funding that serves the mission of the University and requires active administrative or scholarly involvement; administrative duties at the Department, College, or University level that are beyond those typically expected of tenure-track faculty; a high level of research, scholarship, and/or creative activity; active

supervision of theses and student-led research/creative activity which may be considered an intensive form of non-classroom teaching; instruction in a variety of courses that requires unusual preparation time; and/or instruction of large classes without grading (or other) assistance. In the event that a faculty member either requests or has reduced teaching responsibilities for any of these reasons, the Department Head must notify or otherwise consult with the Dean to ensure that resources are available to cover what may result in additional instructional costs (i.e., adjunct pay or overload pay for other faculty to cover classes).

Departmental bylaws provide detail about specific responsibilities for faculty members and may require additional or more specific responsibilities beyond those described above. For example, a Department may require non-tenure track faculty to engage in advising and service or a department may require service by all tenured and tenure-track faculty members.

III.E Course Syllabi

It is the responsibility of the faculty to prepare and make available course syllabi on or before the first day of each new semester/term. Syllabi should be made available to students via the University learning management system. Syllabus guidelines and resources are provided by the Walker Center for Teaching and Learning. <https://www.utc.edu/walker-center-teaching-learning/information-services/syllabus-resources.php>

III.F Collegiality

In addition to the three main criteria for tenure and promotion – teaching and advising; research, scholarship, and/or creative activity; and service – faculty should be mindful that collegiality is an integral part of the health and well-being of any department and the College as a whole. Collegiality (or the lack thereof), therefore, tends to impact effectiveness in the three main criteria for tenure and promotion. It follows, then, that collegiality (or the lack thereof) may impact annual performance evaluations. For that reason, faculty should be mindful of the College’s “Statement on Collegiality”:

Collegiality requires the capacity to relate well and constructively with peers and members (faculty, staff, students and administrators) of our campus community. Collegial behavior and support for the common good, therefore, is highlighted by civility and respect for one another, particularly as we may disagree with one another from time to time. Even in our disagreement, we must work well with one another as we share in institutional and departmental goals and responsibilities.

III.G Faculty Participation in Commencement Exercises

Faculty in the College are expected to attend at least one (1) commencement exercise each year.

IV Tenure-Track Faculty

Throughout the following pages, the phrase “tenure-track faculty” applies to tenure-eligible and tenured faculty alike.

IV.A Selection of New Faculty for Tenure-Track Appointments

IV.A.1 Authorization to Search and Letter of Appointment

As stated in the Faculty Handbook, the Dean “must obtain authorization from the Provost to begin a search for a tenure-track faculty position” (Section 3.1). Before doing so, the Dean will request proposals to replace faculty or to search for new full-time faculty from Department Heads, who should consult with Department colleagues on curricular need, programmatic changes, and the like. Doing so ensures that requests align with student needs, strategic growth within the Department, and strategic initiatives (i.e., new academic and/or research areas) on campus.

IV.A.2 Authorization to Search and Letter of Appointment

Per Section 3.1.6 of the Faculty Handbook, “Only the letter of appointment from the Provost to the candidate regarding the terms and conditions of the appointment is binding on UTC. Any other representations concerning the terms and conditions of the appointment, whether oral or written, are not authorized by UTC and not binding on UTC. The new faculty member's written acceptance of the letter of appointment, together with execution of normal UTC employment forms, completes the initial appointment to employment between UTC and the faculty member.” (See Section 3.1. of the Faculty Handbook for additional information about “Recommendations to Appoint” and “Official Notification of Appointment” to ensure proper appointment procedures.)

IV.A.3 Startup Costs

No startup costs will be included in the letter of appointment without prior review and approval by the Dean.

IV.B Commitment to Diversity

The College proudly supports diversity and inclusion in its many forms through our daily activities and our strategic plan. Specifically, Goal 3 of the College’s strategic plan, including subgoals, reads as follows:

Goal 3: The College of Arts and Sciences embraces cultural and intellectual diversity. The College of Arts and Sciences—its leadership, faculty, and staff—is committed to a campus culture that respects the inherent worth of every person and that is enriched by our diverse backgrounds.

- a. Participate in the implementation of an institutional diversity plan by creating a college-level diversity plan which defines and sets clear metrics for diversity of faculty, staff, and students.*
- b. Advocate for a culture of inclusion, including physical and technological access for students, faculty and staff with disabilities.*
- c. Increase opportunities for students, faculty, and staff to have an international or study abroad*

- experience to ensure first-hand exposure to global examples of cultural, architectural, intellectual and scientific achievement.*
- d. Offer educational opportunities that promote an awareness of and an appreciation of divergent worldviews.*
 - e. Showcase and promote multidisciplinary and interdisciplinary research, teaching, and creative activities.*

Like the University as a whole, the College is committed both to *recruiting* outstanding faculty from a diverse pool of applicants and to *retaining* our colleagues who enrich the College and our Departments in part because of our diverse backgrounds, experiences, research areas, and more. As such, we emphasize that each Department should advertise position vacancies in an effort to obtain a diverse pool of qualified applicants. For each search, the Director of the Office of Equity and Inclusion ("OEI") is contacted to advise our Departments regarding appropriate search procedures that should be followed. (See the Faculty Handbook, Section 3.1.2. for more information.)

IV.C Criteria/Standards for Appointment to Faculty Ranks

Departments within the College shall provide their faculty members with the resources necessary to perform assigned duties, including office space, office and pedagogical supplies, support services, and equipment. Departments within the College likewise must have consistent criteria for assigning teaching duties to all faculty members.

IV.C.1 Criteria for Appointment to Faculty Rank

Criteria for appointment to faculty ranks reflect the rigorous preparation necessary for University teaching, research, creative activity, the various service activities expected of the faculty members of a major university, and the diversity of missions performed by the College's numerous Departments. For all faculty ranks, effective advising and mentorship is understood to be part of the task of teaching.

UTC has established the following general criteria that faculty members are expected to meet for the appropriate rank. Each Department within the College must establish its own metrics and standards for evaluating such criteria for faculty rank appointments within the Department, and the Department's specific metrics and standards shall be published in the Department's bylaws.

An **Assistant Professor** is expected to:

1. have a doctorate degree or other terminal degree in his or her discipline or present equivalent training and experience;
2. show potential or have demonstrated ability as a teacher;
3. show potential or have demonstrated evidence of research, scholarship, and/or creative activities;
4. have demonstrated willingness to participate effectively in professional activities other than teaching and research; and
5. have demonstrated ability to relate appropriately to students and professional colleagues.

An **Associate Professor** is expected to:

1. have a doctorate degree or other terminal degree in his or her discipline or present equivalent training and experience;
2. have achieved a reputation as an accomplished teacher – demonstrated through student evaluations that are indicative of success in the classroom (or various modalities) and through teaching evaluations that are performed by peers, mentors, and/or the Department Head;
3. have achieved a good record in research, scholarship, and/or creative activities;
4. have an established record of effective participation in professional activities other than teaching and research;
5. have demonstrated ability to relate appropriately to students and professional colleagues; and
6. have demonstrated excellence in at least one of the three areas of responsibility (i.e., teaching, research, and service) required for full-time faculty status.

A **Professor** is expected to:

1. have a doctorate degree or other terminal degree in his or her discipline or present equivalent training and experience;
2. have achieved and maintained a reputation as an accomplished teacher – demonstrated through student evaluations that are indicative of success in the classroom (or various modalities) and through teaching evaluations that are performed by peers, mentors, and/or the Department Head;
3. have achieved and maintained a significant record in research, scholarship, and/or creative activities;
4. have achieved and maintained a significant record of effective participation in professional activities other than teaching and research;
5. have demonstrated an ongoing ability to relate appropriately to students and professional colleagues; and
6. have demonstrated excellence in at least two of the three areas of responsibility (i.e., teaching, research, and service) required for full-time faculty status.

The previous “Criteria for Appointment to Faculty Rank” section is adapted from and aims to be consistent with Section 3.2.1.1 - 3.2.1.3 of the Faculty Handbook.

IV.C.2 Completion of the Terminal Degree after Hire

A faculty member who has not completed the terminal degree in his or her discipline (e.g., Ph.D.) but who otherwise meets all of the other criteria for the rank of Assistant Professor may be initially appointed to a tenure-track full-time academic year appointment at the rank of Assistant Professor and noted as "All But Dissertation" or "ABD," subject to the following conditions:

If appointed in August, the faculty member will be required to complete his or her terminal degree on or before July 31 after completing his or her first full academic year (i.e., Fall and Spring semesters) in order to retain the rank of Assistant Professor; or

If appointed in January, the faculty member will be required to complete his or her terminal degree on or before July 31 after completing half of his or her first academic year (i.e., the Spring semester) in order to retain the rank of Assistant Professor; or

Such conditions as are imposed by the Provost at the time of the faculty member's initial appointment and set forth in the initial appointment letter.

The faculty member's failure to complete his or her terminal degree within the applicable time

period set forth in this section constitutes adequate cause for terminating the faculty member's employment. The tenure probationary period for a faculty member initially appointed under such circumstances is treated in an identical manner as the tenure probationary period for a faculty member initially appointed at the rank of Assistant Professor who already has his or her terminal degree at the time of the appointment.

IV.D Reappointment Process

All departments within the College abide by reappointment processes that are described in the Faculty Handbook. See Section 3.7 of the Faculty Handbook (“Reappointment Review Process”).

IV.D.1 RTP Committee's Role in the Reappointment Process

The Faculty Handbook provides that the departmental RTP Committee will perform a reappointment review of a tenure-track faculty member only if the Department Head recommends non-reappointment, or otherwise, only in the faculty member's mid-probationary review year (i.e., year 3). However, each Department may elect for its RTP Committee to provide the initial recommendation on reappointment in each year of the faculty member's probationary period.

IV.D.2 Reappointment Materials Reviewed by the RTP Committee

Department bylaws shall determine processes for reappointment review and which materials, in keeping with any requirements set forth in the Faculty Handbook, are evaluated by the departmental RTP Committee during reappointment review.

IV.E Tenure

IV.E.1 Criteria for Tenure Consideration

Candidates for tenure must, at a minimum, meet the criteria for appointment to the rank of Associate Professor in order to be awarded tenure. Each Department within the College establishes and publishes in departmental bylaws specific departmental criteria and standards for tenure.

IV.E.2 Peer Review of Teaching

Peer review of teaching is an excellent way for our colleagues to receive constructive input on teaching effectiveness. Prior to consideration for tenure and/or promotion, tenure-track faculty who have teaching responsibilities will be subject to a peer review of their teaching performance. Peer evaluations of tenure-track faculty classroom and/or online teaching is a part of the tenure and/or promotion review process. That is, peer evaluations are to be included in tenure and/or promotion dossiers. Departments in the College shall establish procedures for conducting teaching peer reviews for the tenure and/or promotion review processes and publish such procedures in departmental bylaws.

IV.E.3 External Review Process

As stated in the Faculty Handbook, “The purpose of the external review is *not* to make a recommendation regarding tenure/promotion but to provide an objective evaluation of the faculty member's record to date in the three performance areas of teaching, research, and service.” See Section 3.10.4 of the Faculty Handbook for related information.

In keeping with the Faculty Handbook, the College requires that the review of dossiers for tenure and promotion must include reviews by at least two (2) external reviewers. Should fewer than two (2) external reviews be returned by the end of this process, the chair of the departmental RTP Committee will note the efforts made to solicit reviewers and their reviews.

Prior to October 8th in the year that a tenure-eligible faculty member applies for tenure and/or promotion, the faculty member will provide the departmental RTP Committee with a dossier (hard copy or electronic) that documents evidence of effectiveness in the “three performance areas of teaching, research, and service.”

The departmental RTP Committee and the candidate for tenure and/or promotion should collaborate to generate a list of appropriate reviewers. In doing so, the candidate will provide a list of potential external reviewers, no fewer than four (4), that the departmental RTP Committee will review. Each potential reviewer should be identified by name, title, institution, and be accompanied by a brief rationale for her or his selection. The departmental RTP Committee will choose at least two (2) reviewers from the faculty member's list. The Committee will then generate a list of potential external reviewers, no fewer than four (4), that the faculty member will review. Each potential reviewer should be identified by name, title, institution, and be accompanied by a brief rationale for her or his selection. From the Committee's list, the candidate will choose no fewer than two (2) reviewers. No fewer than four (4) external reviewers remain at this point.

By November 1st, the chair of the departmental RTP Committee, in collaboration with the Department Head, will solicit via email a minimum of four (4) and a maximum of seven (7) external reviewers using a “neutral” template letter supplied by the College. (In the event that the Department Head is being evaluated for tenure and/or promotion, the cover letter will be sent by the chair of the departmental RTP Committee and the Dean of the College.) Should some of the selected reviewers decline, the Committee would go back to the two lists and continue the process until at least three (3) reviewers agree to submit an external review of the candidate's materials. Reviewers will then be provided with the candidate's dossier and they will be asked to supply two things by no later than January 15th: 1) a one-to-two page letter of evaluation, and 2) a copy of their curriculum vitae.

External reviewers should be selected based on the following guidelines.

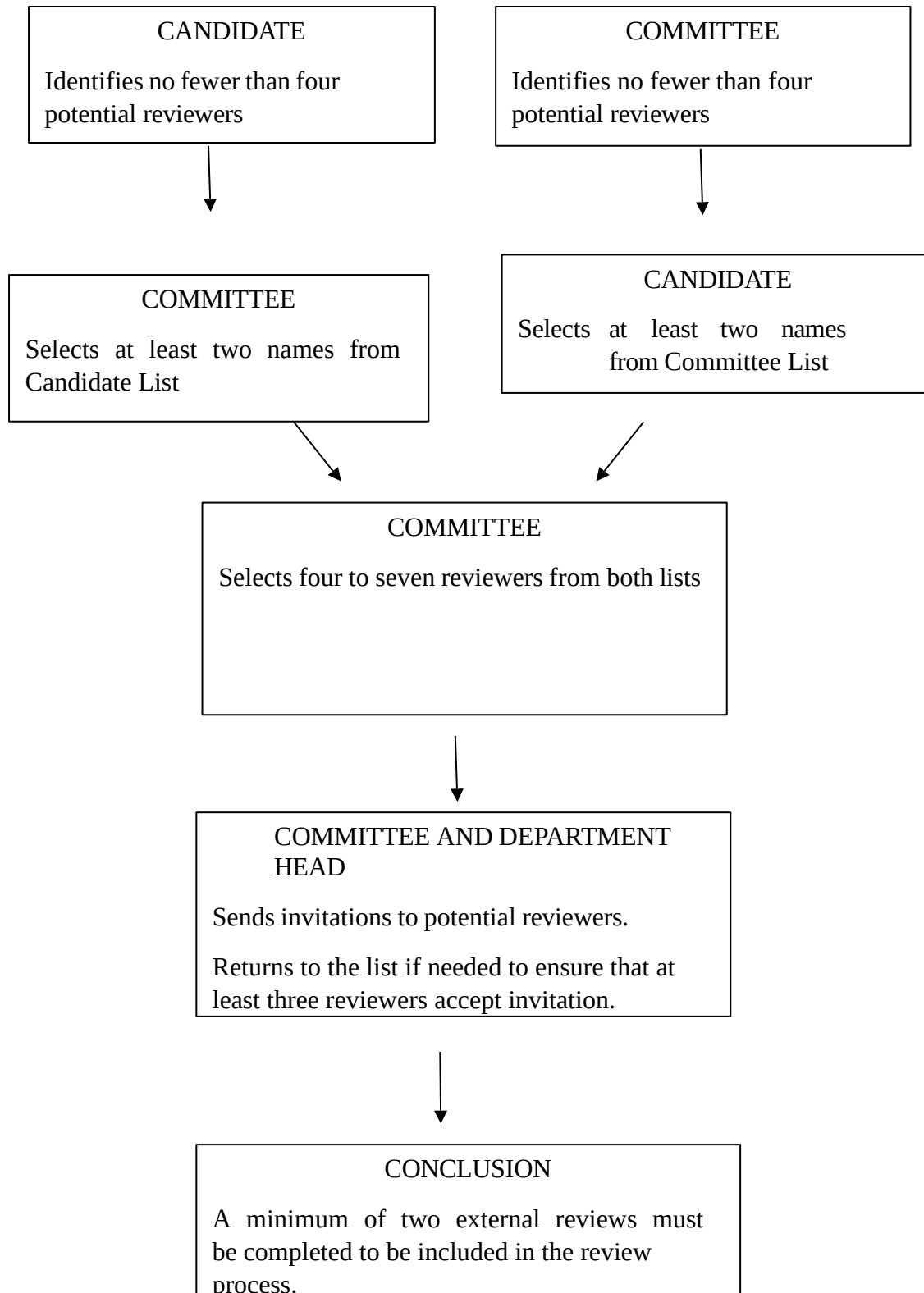
- Reviewers should be tenured and at or above the rank that the candidate seeks.
- Reviewers should be at a peer institution, an aspirant peer institution, or an institution that is universally recognized as excellent.
- Reviewers should not have had a working relationship with the candidate (dissertation director, chairperson, co-author, etc.). That is, there should be no conflict of interest with the candidate.
- Reviewers should not be in contact with the candidate about the review process from the time that they accept the external review assignment. The candidate should also not attempt to

contact the external reviewer.

Candidates must not contact external reviewers during the review process. In the event that the external reviewers should be contacted during the review process – for example, to clarify procedures or deadlines – only the chair of the departmental RTP Committee or the Department Head may contact the reviewers. In the event that the Department Head is being evaluated for tenure or promotion, the chair of the departmental RTP Committee or the Dean will communicate with the external reviewers.

External reviews will be delivered directly to the chair of the departmental RTP Committee.

FLOW CHART FOR EXTERNAL REVIEW PROCESS



IV.E.4 Quorum for RTP Committee's Tenure and Promotion Recommendations

A majority of the eligible voting faculty must be present for departmental RTP Committee votes on a candidate's tenure and/or promotion. This majority of the eligible voting faculty (i.e., both associate and full professors voting on candidates who seek promotion to the rank of associate professor, and only full professors voting on candidates who seek promotion to the rank of full professor) is considered the minimum requirement. Departmental bylaws may contain further policies on a quorum that is required for the departmental RTP Committee to make recommendations regarding tenure and promotion.

V Non-Tenure-Track Faculty

V.A Selection of New Faculty for Non-Tenure-Track Appointments

The College follows standard University hiring procedures when searching for both full-time and part-time non-tenure-track faculty. Because lecturers are full-time faculty, the Dean will interview all candidates for lecturer positions in the College.

V.B General Appointment Terms and Conditions

The appointment terms and conditions applicable to non-tenure-track faculty within the Department should be published in departmental bylaws. See Faculty Handbook, Section 4.2. For example, the level of participation allowed non-tenure-track faculty in departmental activities must be outlined in departmental bylaws.

V.C Evaluations of Non-Tenure-Track Faculty

Each department is responsible for establishing procedures in its bylaws the regular evaluation of non-tenure track faculty members within the department. See Faculty Handbook, Section 4.4.

V.D Non-Tenure-Track Faculty Rank Appointments/Promotions

The College may hire non-tenure-track teaching faculty members for specific teaching assignments. Ordinarily, our non-tenure track colleagues are not expected to engage in research, scholarly productivity, or creative activity. Some of non-tenure-track faculty are, however, expected to participate in service as a condition of employment.

The University and the College use the following ranks or titles for Teaching appointments:

Lecturer: This rank is for those who hold the appropriate degree for their discipline (or its professional equivalent) and who are appointed for full or part-time teaching. All Teaching appointments at this rank will be made for a definite term of one year or less.

Associate Lecturer: Faculty members who have held Teaching appointments at the rank of Lecturer for a minimum of four (4) years may be considered for promotion to the rank of Associate Lecturer. Teaching appointments at this rank will be made for a definite term of up to three years.

Senior Lecturer: Faculty members who have held Teaching appointments at the rank of Associate Lecturer for a minimum of eight (8) years may be considered for promotion to the rank of Senior Lecturer. Teaching appointments at this rank will be made for a definite term of up to five years.

Distinguished Lecturer: This rank is for those Senior Lecturers who hold a degree appropriate to their discipline (or its professional equivalent) and who have demonstrated excellence in teaching. Tenured faculty members within the academic

department will evaluate and make recommendations for appointments to the rank of Distinguished Lecturer, in accordance with departmental and college bylaws.

Appointments are renewable subject to availability of funds, satisfactory performance, and staffing needs. Each Department shall establish the criteria and process for evaluating applications for promotion of departmental faculty members holding Teaching appointments, subject to the approval of the Dean and Provost. The departmental criteria and process for evaluating promotion decisions shall be published in departmental bylaws, and they must be consistent with the Faculty Handbook as well as expectations for excellence in teaching within the College. (See Section 4.7. of the Faculty Handbook for additional information.)

VI Documenting Success in Teaching and Advisement (for all faculty)

Documentation of effective teaching should attest to the quality of a faculty member's instruction. Such documentation may take many forms, including but not limited to the following.

- Student evaluations. Candidates may provide student evaluations of their teaching. Candidates may likewise ask their Department Head to review student evaluations over a period of years and write a summary of evident trends. Additionally, if the evaluations point to problems which have been resolved, i.e., improvements in teaching, the Department Head may wish to explain.
- Representative syllabi and/or assessments of course planning and structure with regard to courses taught. Candidates may include representative syllabi of courses taught for the first time and/or syllabi of courses taught for the first time by a new pedagogical method or a new delivery system (viz. online). Candidates may wish to annotate such syllabi in order to make clear those elements which they believe document a commitment to effective teaching.
- Peer or Department Head observations of classroom teaching. Candidates should invite their Department Head, a faculty mentor, and/or department colleagues to observe their classroom teaching. It is reasonable to expect the observer to provide a written evaluation of observed strengths and weaknesses, along with justification of the evaluation. Because all Departments in the College have departmental bylaws, candidates should follow departmental bylaws for teaching observations.
- Performance of students with regard to any appropriate outcomes measures (departmental examinations, external tests, etc.). Candidates may ask their Department Head to provide comparative student outcome results, if available. Otherwise, candidates are invited to discuss with their Department Head any means by which they may be better able to document student outcomes in their courses.
- Awards for teaching excellence. Candidates may wish to document nominations for and/or receipt of prestigious teaching awards. Effective documentation of such honors often depends on frank assessment by the Department Head of their relative significance.
- Participation in professional development activities related to teaching. Such activities may include both those candidates have attended individually and those candidates have attended with colleagues, e.g., the Instructional Excellence Retreat.
- Participation in on-campus, regional, or national curriculum development activities.
- Teaching philosophy or a statement on successful and effective teaching.
- Development and promulgation of innovative teaching materials and/or innovative teaching methods. Candidates may elect to include in the dossier examples of innovative teaching materials or narrative accounts of innovative teaching methods. It is good practice to discuss such content with colleagues and/or with the Department Head. It is likewise good practice to provide context for and explanation of those materials and methods. Candidates may ask their Department Head and/or colleagues to review this content in order to determine the appropriateness or necessity of such materials.
- Committee service directly related to the improvement of teaching.
- Receipt of instructional or curricular grants from external agencies (with information for each citation regarding title of project and nature of the accomplishments). Determining whether individual grants are better reported under teaching or research is not always easy. Candidates must not, however, double report this grant information. A brief note in one section indicating where fuller documentation of an activity may be found offers a means of avoiding this problem.
- Research and refereed publication in pedagogy or the scholarship of teaching and learning. The comment above on where to report is relevant here also.

VII Documenting Success in Research, Scholarship, and/or Creative Achievement (for all faculty)

Documentation of such success should attest to the quality of the candidate's scholarship, research, or creative achievement. Such documentation may take many forms, but it should always be clear what type of publication is included in the CV, i.e., monograph, edited collection, review essay, peer reviewed article, individually-authored article, creative work, screen play, etc. Such documentation may include the following.

- Books and monographs published (with bibliographic information for each citation). Including works not published in an attempt to make the dossier appear stronger in fact weakens the dossier. Candidates may describe unpublished works as "in progress" and seek independent evaluation of such work. If candidates are not providing copies of the publications themselves, complete and accurate citation information must be in the CV, including number of pages. Custom-published works merit inclusion, but care should be taken to distinguish such books from those which go through the traditional vetting, i.e., peer review, process.
- Articles published in refereed scholarly journals (with bibliographic information for each citation). Published statements of editorial policies provide effective documentation regarding the refereed status of a publication. Candidates may also include information about the acceptance rate of journals in which their articles appear.
- Reviews of books and monographs in the candidate's field.
- Other articles. Articles published through less formal processes (e.g., in academic newsletters, community bulletins, etc.) may offer valuable documentation of research, scholarship, and/or creative achievement. However, distinguishing clearly between refereed and non-refereed publications can enhance the credibility of the dossier. In general, candidates must take care not to mix genres of publications (e.g., including a poem or a column from a local newspaper among articles).
- Commissioned Research. Candidates may have conducted research in the discipline as part of a commissioned project and published the results. Be sure that any such efforts that result from paid consulting are so identified. Distinguishing clearly between research and scholarly or creative efforts for which a candidate is paid and those conducted independently will enhance the credibility of the dossier.
- Scholarly notes, reviews of scholarly books, etc. (with bibliographic information for each citation).
- Scholarly presentations (with information for each citation regarding the title of the presentation, the name of the organization sponsoring the meeting, the site of the meeting, and the date of the meeting). Correspondence with meeting organizers and program materials often will emphasize the competitive nature of the program for which a candidate is selected. Less formal presentations may offer valuable documentation of research or may be included more appropriately under the categories of teaching or service. Distinguishing clearly between refereed and non-refereed presentations can enhance the credibility of the dossier.
- Receipt of basic or applied research grants from external agencies (with information for each citation regarding the title of the project, the agency from which the grant was obtained, and the term of the grant).
- Submission of a substantive research report or creative project to an external sponsor or entity.
- Authorship of grant proposals. Candidates may be the Principal Investigator and likely the lead author on individual and/or group grants. Even when the grant has an instructional or service orientation, the basic work of authoring a grant proposal, particularly where it requires significant investigation, can itself be considered a contribution to research or creative activity.

- Citations of research, scholarship, or creative activity in other works published. Even a modest reference may suggest the influence of a candidate's work on the candidate's field.
- UTC awards, grants, and fellowships for research, scholarship, and creative activity.
- External awards, grants, and fellowships for research, scholarship, and creative activity. Do not neglect to mention modest grants from local foundations, state agencies, and organizations, so long as the received support indicates recognition of your professional expertise.
- Recitals, art exhibitions, creative and/or dramatic performances (with information for each citation regarding publication, sites, dates, and whether the activity was invited or juried, local, regional, national or international). Candidates may explore means of obtaining reactions that go beyond local notoriety.
- Critical reviews of the candidate's recitals, art exhibitions, creative works, etc. Candidates may ask their Department Head to invite critics to observe their work.
- Electronic publication. Scholarly work is scholarly work, regardless of the medium in which it is published. As is the case with print publications, candidates must be careful to contextualize and identify their published works as peer-reviewed/refereed or not. That is, the same care must be given to citation and documentation for electronic publications that we have come to expect for print publications.

VIII Documenting Success in Service (for all faculty)

Supporting documentation of success in service should attest to the quality of the service performed by the candidate consistent with a) her or his professional expertise and b) her or his role in the department, the College, and/or the University communities. Such documentation may include the following.

- Receipt of public service grants from external agencies (with information for each citation regarding title of project, the granting agency, and the term of the grant).
- Successful completion of external public service assignments (with information for each citation regarding title of project and the nature of the accomplishments).
- External assessments of candidate's public service activity.
- UTC awards and grants for public service activity.
- Citations of public service in works of research or scholarship.
- External awards, grants, and fellowships for service activity.
- Service in campus governance (with information for each citation regarding offices held and assignments completed).
- Assessments of institutional service. Candidates may request of committee chairs and colleagues written evaluations of the candidate's contributions to a committee in instances where such contributions exceed the norm.
- Public service that aligns with a candidate's professional expertise. Although candidates should not cite activities which have no relation to their academic assignment, candidates should not neglect activities which reflect their expertise.

IX Ratification and Amendments of the Bylaws

IX.A Ratification

The College may ratify these bylaws with approval of two-thirds of the voting faculty casting a ballot at a business meeting of the College. If ratified by the voting faculty, these bylaws must be approved by the Dean and Provost before the bylaws may become effective. These bylaws shall go into effect upon the first day of the next full calendar month after ratification by the voting faculty, subject to their approval by the Dean and Provost.

IX.B Amendments

IX.B.1 Proposal

The Dean may propose an amendment to these bylaws, often after consultation with the Executive Committee of the College.

Alternatively, a group of at least a dozen voting faculty in the College may propose an amendment to these bylaws, provided those voting faculty represent at least four Departments housed within the College. Any such amendment must be delivered as a written document to the Dean, who must share the amendment with the Executive Committee.

IX.B.2 Distribution

The Dean shall distribute any duly proposed amendment for consideration by the full voting faculty of the College.

IX.B.3 Voting

At the next business meeting of the College which takes place at least ten (10) working days after the distribution of the amendment, the full voting faculty will consider the proposed amendment. If at least two-thirds of the voting faculty casting a ballot at that meeting approve the amendment, then it shall be forwarded to the Dean and Provost for review and approval. An amendment shall go into effect upon the first day of the next full calendar month after approval by the voting faculty, subject to their approval by the Dean and Provost.

Appendix 4-C

Departmental Bylaws

**Department of Biology, Geology, and Environmental Science
University of Tennessee at Chattanooga**

Approved August 1, 2022

Table of Contents

I.	INTRODUCTION.....	4
II.	DEPARTMENTAL MEETINGS, VOTING, AND MEMBERSHIP	4
A.	Frequency of Meetings.....	4
B.	Voting Procedures	4
C.	Voting Membership	4
D.	Adoption and Amendment of Departmental Bylaws	5
E.	Curricular and Key Programmatic Changes.....	5
III.	DEPARTMENTAL COMMITTEES	6
A.	Standing Committees	6
B.	Ad hoc Committees	7
IV.	HIRING.....	8
A.	Faculty Searches	8
1.	Search Committee Composition.....	8
2.	Search Procedures	8
B.	Department Head Searches	8
1.	Department Head Search Committee Composition.....	8
2.	Department Head Search Procedures	8
C.	Staff Searches.....	9
1.	Staff Search Committee Composition	9
2.	Staff Search Procedures.....	9
V.	PEER MENTORING	10
A.	Peer Review of Faculty Instruction	10
B.	Peer Mentoring of New Faculty.....	10
VI.	REAPPOINTMENT, PROMOTION, AND TENURE OF TENURE-TRACK FACULTY AND EDO EVALUATIONS OF FULL-TIME FACULTY	11
A.	Reappointment, Tenure, and Promotion of Tenure-Track Faculty	11
1.	Standard Format for RTP Folder and Dossier for Tenure-Track Faculty.....	11
2.	Reappointment of Tenure-Track Faculty	13
3.	Tenure and Promotion of Tenure-Track Faculty	14
4.	External Review Process for Promotion and Tenure	23
5.	Departmental Tenure Recommendations.....	23
B.	Evaluation and Development by Objectives (EDO).....	23
VII.	EVALUATIONS OF NON-TENURE-TRACK FACULTY	24
A.	Reappointment and Promotion.....	25

1.	Standard Format for Non-Tenure-Track Faculty Reappointment and Promotion Materials	25
2.	Reappointment of Non-Tenure-Track Faculty	27
3.	Promotion of Non-Tenure-Track Faculty	28
4.	Departmental Non-Tenure-Track Faculty Recommendations	33
VIII.	EVALUATION OF ADJUNCT FACULTY	34

I. INTRODUCTION

The Department of Biology, Geology, and Environmental Science ("BGE" or "Department") has established these bylaws ("Bylaws") that serve to mediate fair understanding of procedures and policies among faculty and staff at the University of Tennessee at Chattanooga ("UTC"). Our unified department maintains and promotes disciplinary identities and strengths in the areas of Biology, Geology and Environmental Science. These Bylaws govern the Department within the College of Arts and Sciences ("CAS") at UTC. If any policy or procedure in these Bylaws should be found to conflict with policies or procedures of (1) CAS, (2) UTC, or (3) the University of Tennessee Board of Trustees, the higher level policies and procedures shall take precedence.

II. DEPARTMENTAL MEETINGS, VOTING, AND MEMBERSHIP

A. Frequency of Meetings

Departmental faculty and staff meet approximately biweekly during fall and spring semesters. The Department Head may cancel meetings if there is no business or may schedule additional meetings if needed.

B. Voting Procedures

1. Voting will typically take place during departmental meetings.
2. At least two-thirds (>67%) of the voting membership shall constitute a quorum.
3. A majority vote (>50%) by a quorum will be sufficient to carry a measure.
4. When necessary due to time constraints and/or upcoming CAS or University deadlines, the Department Head and/or faculty may allow proxy voting or electronic voting, except where prohibited by University policy. Circumstances under which proxy or electronic voting may be allowed include:
 - a. A faculty member is unable to attend a meeting.
 - b. An issue was discussed at a faculty meeting, but no vote was taken because additional information is needed.
 - c. An issue that requires a response arises when classes are not in session.
 - d. A majority of faculty have met face-to-face and discussed the issue.
 - e. Circumstances make it impossible or inconvenient to meet.
 - f. There is nothing to be gained by meeting in person.
 - g. Issues that do not require a vote by the full faculty (e.g., departmental committees).
5. For matters for which University policy requires that an anonymous vote be taken, votes shall be cast anonymously by written ballot.
6. Notwithstanding any provision in this Section I. to the contrary, the membership and voting procedure requirements applicable to the departmental Reappointment, Tenure and Promotion (RTP) Committee under the Faculty Handbook apply.

C. Voting Membership

1. Tenured faculty, tenure-track faculty, full-time non-tenure-track faculty, faculty associates, laboratory coordinators, and professional advisors may vote on curricular issues, degree requirements, programs, bylaws, annual performance review standards, scholarships and awards, allocation of resources, hiring, etc.
2. Tenured faculty may vote on issues related to termination of tenured faculty for adequate cause, promotion, tenure, and reappointment (when necessary) of tenure-track faculty and non-tenure-track faculty if assigned to the Non-Tenure-Track Reappointment and Promotion Committee (NTTRP). Only tenured faculty holding at least the rank to which a tenure-track candidate seeks promotion are eligible to consider an applicant's request.
3. Lecturer faculty holding the rank of Associate Lecturer, Senior Lecturer or Distinguished Lecturer and tenured faculty serving on the NTTRP Committee may vote on issues related to promotion of non-tenure-track faculty. Only lecturers holding at least the rank to which a candidate seeks promotion are eligible to consider an applicant's request. The NTTRP Committee will consist of all Lecturer faculty holding the rank of Associate-, Senior- or Distinguished Lecturer and two tenured faculty, one appointed by the Department Head and another appointed by the co-chairs of the RTP Committee. The chair of the NTTRP Committee will be a Senior or Distinguished Lecturer appointed by the Department Head.
4. Phased retirement faculty, retired faculty, and part-time faculty do not have voting rights, but they are welcome to attend meetings and are invited to participate in an advisory capacity.
5. Temporary suspension of a voting procedure or membership policy must be supported by at least three-fourths (>75%) of the voting membership.

D. Adoption and Amendment of Departmental Bylaws

Adoption and amendment of these Bylaws requires a vote to adopt/amend by at least two-thirds (>67%) of a quorum of the voting membership. The normal departmental voting requirements of a simple majority (>50%) of a quorum of the voting membership do not apply to votes to adopt or amend these Bylaws. Amendments to these Bylaws will become effective only upon approval of the CAS Dean and Provost.

E. Curricular and Key Programmatic Changes

Prior to open department discussion and voting on curricular changes, the faculty who have expertise in the relevant discipline will be given an opportunity to provide input on the proposal at hand. After that, the discussion will be opened up to the full Department and motions can be made.

Curriculum proposals for courses and/or major program changes that are exclusively of consequence to that program and do not affect other programs in the Department must receive a majority of votes by the faculty in that discipline. The results of that vote will be presented as an information item to the department faculty.

III. DEPARTMENTAL COMMITTEES

The Department has multiple standing committees and creates ad hoc committees as needed. Each year, the Department Head requests committee preferences and then assigns faculty to committees and identifies committee chairs – except for the Reappointment, Tenure, and Promotion (RTP) Committee, which consists of all tenured Departmental faculty members except the Department Head and whose chair is elected by members of the RTP Committee.

A. Standing Committees

Currently, the Department has 22 standing committees (described in the following table).

Committee	Purpose of committee
AIPG Committee	Maintains relationships and coordinates activities with student group American Institute of Professional Geologists (AIPG)
Assessment and Retention	Develops annual outcomes and compiles annual assessment reports for BGE's four academic programs
Curriculum Planning	Develops and monitors undergraduate and graduate curricula; assists faculty in the preparation of curriculum proposals; advises the Department on curriculum proposals
Departmental Honors Committee	Sets guidelines for and manages review of departmental honors thesis proposals
Development	Manages fundraising initiatives and development activities in coordination with relevant UTC offices
EDGE Advisory	Maintains relationships and coordinates activities with student environmental group EDGE
Equipment	Assesses current and future equipment needs and develops short- and long-range priority lists
Field Station	Oversees use, maintenance, and development of field stations
Geology Club	Maintains relationships and coordinates activities with Geology Club student group
Graduate	Makes decisions regarding admission to the MS Environmental Science program; makes recommendations to full BGE faculty concerning curriculum, policies, and procedures
Hiring Planning	Assesses existing and future needs to hire departmental faculty and staff; recommends discipline-specific hires to sustain and improve BGE programs
Natural History Museum	Oversees use, maintenance, and improvement of museum collections of plants, fungi, and animals
Newsletter and Public Relations	Develops and coordinates BGE newsletter and organizes public relations activities of the Department
Non-Tenure-Track Reappointment and Promotion Committee	Reviews NTT faculty portfolios and makes recommendations for reappointment and promotion. Composed of two tenured representatives and all Associate, Senior and Distinguished Lecturers

Pre-Professional Advisory	Advises pre-professional students; arranges recruitment visits; keeps records concerning student acceptance rates

Reappointment, Tenure, and Promotion	Reviews faculty dossiers and makes recommendations for reappointment, tenure, and promotion. Composed of all tenured faculty members, except the Department Head
Schedule	Schedules classes; develops and implements procedures for ensuring BGE's instructional effort is equitably divided
Space Planning	Assesses current and future space needs of BGE; recommends allocation of space for Department
Strategic Plan	Develops, revises, and leads assessment of BGE Strategic Plan
Student Awards & Relations	Recommends students for annual awards, scholarships, and recognition; develops faculty-student events that connect students to the Department
Tri-Beta Advisory	Maintains relationships and coordinates activities of Department's honor society, Beta Beta, Beta
Wildlife Zoology Club	Maintains relationships and coordinates activities with student wildlife group
WINS	Maintains relationships and coordinates activities with Women in the Natural Sciences (WINS) student group

B. Ad hoc Committees

The Department Head may create ad hoc committees as needed, and assign faculty to serve on these committees. The Department Head will consider faculty work load, interest, and expertise when making ad hoc committee assignments.

IV. HIRING

All BGE search committees must follow all applicable procedures and requirements of CAS, the Office of Equity and Inclusion (OEI), the Faculty Handbook, Human Resources, the University, and the University of Tennessee System.

A. Faculty Searches

1. Search Committee Composition

Faculty search committees are established by the Department Head, subject to the following principles: (1) all or some members of the committee will have substantive knowledge of the discipline that the position involves; and (2) the committee will be diverse to the extent possible with regard to factors such as rank, gender, ethnicity, and race. Search committees are normally composed of faculty in BGE; however, an outside person might be added to the committee if the Department Head and faculty believe it would enhance the ability of the committee to assess candidate qualifications. Faculty members not assigned to the search committee are welcome to participate in the review of applicants.

2. Search Procedures

Initial candidate evaluations and virtual interviews are conducted by the search committee. The full Department will have the opportunity to: (1) provide input regarding candidates who are selected for on-campus interviews; (2) participate in on-campus interviews; and (3) provide input into the final ranking of candidates recommended for hiring.

Appointments to tenure-track positions should satisfy relevant Faculty Handbook criteria for appointment to faculty rank (Section 3.2.1 of Faculty Handbook) and criteria in these Bylaws for tenure and promotion.

B. Department Head Searches

1. Department Head Search Committee Composition

Department head search committees are established by the CAS Dean with the advice and input of BGE, subject to the following principles: (1) committee will be composed primarily of faculty from the Department; (2) committee will be diverse to the extent possible with regard to rank, gender, ethnicity, and race; and (3) committee will include a sitting or former head of another department that is acceptable to the CAS Dean.

2. Department Head Search Procedures

The Department Head is supervised and evaluated by the CAS Dean. Therefore, the CAS Dean takes an enhanced role in determining the search process and selection and appointment of the Department Head, and specific procedures for department head searches are determined by the CAS Dean and upper-level administrators. Regardless of the specific process, a successful candidate must have strong support of both the CAS Dean and BGE faculty and staff. These requirements apply to external and internal department head searches.

C. Staff Searches

1. Staff Search Committee Composition

Staff search committees are established by the Department Head, subject to the following principles: (1) the committee will include departmental administrators and staff with substantive knowledge of the duties of the staff position; (2) the committee will include at least one regular faculty member; and (3) the committee will be diverse to the extent possible with regard to rank, gender, ethnicity, and race. The Department Head typically serves as chair of staff search committees.

2. Staff Search Procedures

Candidate evaluations, interviews, and final recommendations for hiring are made by the search committee. The search committee will keep the faculty informed of its progress during the search.

V. PEER MENTORING

A. Peer Review of Faculty Instruction

The Department's peer review of instruction program is intended to assist new tenure-track and non-tenure-track faculty in improving the quality of their teaching. Two (2) members of the RTP Committee will observe a lecture and a laboratory (where applicable) of each faculty member every semester until all regular course preparations have been evaluated or for a minimum of two years. Each evaluator submits a written report (BGE Peer Evaluation of Instruction Form) to the faculty member for each lecture and each lab reviewed. The report is included in the faculty member's yearly evaluation materials (i.e. with their EDO Performance Report), as well as in the tenure and promotion materials for tenure-track faculty.

B. Peer Mentoring of New Faculty

All new tenure-track and non-tenure-track faculty members will be assigned a faculty mentor. The duties of the mentor are to answer questions and provide guidance on a range of topics including professional development, teaching effectiveness, departmental issues, and RTP procedures. The Department Head will inform new faculty members of their mentor assignment in writing no later than the second week of their first semester at UTC. The faculty member has the right to request, in writing, a new faculty mentor.

VI. REAPPOINTMENT, PROMOTION, AND TENURE OF

TENURE-TRACK FACULTY AND EDO EVALUATIONS OF FULL-TIME FACULTY

The UTC Faculty Handbook and CAS Bylaws address faculty reappointment, tenure, promotion, and annual evaluation. Generally, faculty performance is evaluated within the Department by two distinct but complimentary processes: (1) review by tenured faculty serving on the RTP Committee and review by the Department Head; and (2) review by annual EDO by the faculty member and Department Head.

RTP Committee discussions and deliberations of departmental colleagues are confidential and should be treated as such. That is, RTP Committee discussions and deliberations of candidates must not be shared with anyone outside of the RTP Committee members who actively participated in the candidate's review, including sharing information with candidates. If the committee decides it is necessary to communicate with a faculty member concerning his or her candidacy, the communication should be done by the RTP Committee chair(s).

These Bylaws: (1) expand upon Faculty Handbook and CAS criteria for reappointment, tenure, and promotion of tenure-track faculty; (2) include criteria and a process for reappointment of non-tenure-track faculty; and (3) address the annual EDO review, which is required for all full-time faculty members, regardless of appointment classification.

A. Reappointment, Tenure, and Promotion of Tenure-Track Faculty

1. Standard Format for RTP Folder and Dossier for Tenure-Track Faculty

RTP Folder – The RTP folder consists of a folder that contains the “UTC Reappointment Folder Checklist” (for annual reappointment) or the “UTC Tenure/Promotion Folder Checklist” (for promotion and/or tenure) followed in order by the materials identified in the checklist.

Dossier – The dossier is a comprehensive collection of materials that document faculty activities and accomplishments in all areas of faculty responsibility. The UTC Faculty Handbook contains the following language concerning the dossier:

All tenure candidates must prepare and submit a tenure dossier, which will be reviewed and inform the recommendations made at each stage of the tenure review process. The dossier is standard to the extent that it describes the way in which the candidate has met each of the respective criteria for tenure as listed in this Handbook. The departmental bylaws shall contain a statement of the required contents of the tenure dossier that is consistent with the Faculty Handbook and with applicable college bylaws, unless the dean and the Provost have approved the department's application of tenure dossier requirements established in college bylaws.

The dossier should include a preface that must contain a Curriculum Vita (CV) describing the candidate's education and experience (both prior to coming to UTC and while at UTC) and a one-page executive summary of the same. In addition, the preface to the dossier may contain a summary of the candidate's EDO evaluations. The dossier should be divided into the three distinct components based on the three performance areas outlined in the EDO: (1) teaching and advising; (2) research, scholarship and creative activities; and (3) professional service to the University, profession, and community. The respective components of the dossier should include all documentation for and evidence of activities related to, respectively, the teaching, research, and service in which the candidate has engaged since the candidate's initial appointment at UTC. A teaching philosophy and a record of Student Ratings of Faculty for the candidate must be included in the dossier. Other materials should be included at the discretion of the candidate, and, if possible, on the advice of the departmental RTP Committee. The departmental bylaws shall set forth information pertaining to appropriate activities of faculty members in the academic department for each of the three areas of professional responsibility.

These Bylaws expands the minimum dossier requirements of tenure-track faculty under the UTC Faculty Handbook. First, all probationary tenure-track faculty applying for reappointment should submit both the RTP Folder and a dossier annually. Within the Department, these documents will be reviewed by the RTP Committee and the Department Head (discussed below under "Reappointment"). Second, the Department expands the required content of tenure-track faculty dossiers, which shall contain, at a minimum, the following elements/sections and be arranged in the following order:

- (1) Brief cover letter addressed to departmental RTP Committee;
- (2) Title page including faculty name, rank, and date of dossier submission;
- (3) Table of contents;
- (4) One-page narrative of accomplishments;
- (5) Updated CV;
- (6) Summary of EDO evaluations;
- (7) Teaching and Advising section including:
 - a. Summary of courses taught
 - b. Student teaching evaluations
 - c. Candidate commentary on student evaluations
 - d. Peer-teaching evaluations (for tenure and promotion to Associate Professor)
 - e. Candidate commentary on peer-teaching evaluations

- f. Discussion of student advising activities
 - g. Discussion of student research mentoring;
- (8) Research, Scholarship, and Creative Activities section including (listings of most recent to oldest works):
- a. Peer-reviewed publications
 - b. Book chapter or book publications
 - c. Non-peer-reviewed publications
 - d. Technical reports submitted (e.g., final reports for research grants)
 - e. Invited oral presentations at conferences, other universities, etc.
 - f. Oral/poster presentations at professional conferences
 - g. External and internal grants/contracts awarded
 - h. External and internal grants/contracts pending or declined;
- (9) Professional Service section including record of:
- a. Service to Department or University
 - b. Professional service to one's discipline
 - c. Public service to the community;
- (10) Collegiality statement and evidence demonstrating candidate's ability to relate effectively to students and professional colleagues.

2.Reappointment of Tenure-Track Faculty

The UTC Faculty Handbook contains the following language concerning the reappointment review process of probationary, tenure-track faculty:

In each year of the tenure-track faculty member's probationary period in which the faculty member is subject to consideration for reappointment, the department head is responsible for the careful evaluation of the faculty member in determining whether to recommend reappointment of the faculty member for the following year. Departments may elect to require that the departmental RTP Committee perform the initial evaluation and recommendation on reappointment in each year of the faculty member's probationary period and provide such recommendation to the department head. To the extent a department elects to do so, the department must include such a requirement in its departmental bylaws.

In order to provide probationary tenure-track faculty members with regular,

constructive feedback from the RTP Committee, the RTP Committee will perform the initial evaluation and recommendation regarding reappointment in each year of the faculty member's probationary period. As such, tenure-track faculty applying for reappointment should submit both the RTP Folder and a dossier annually. Within the Department, these documents will be reviewed by the RTP Committee and the Department head. Specifically, the RTP Committee will review and evaluate the faculty member's progress towards tenure and provide the Department Head with a written evaluation of the faculty member's progress toward tenure and include a recommendation for or against reappointment. Upon receipt of the RTP Committee's evaluation, the Department Head will conduct an independent review of the reappointment documents and submit his or her written recommendation for or against reappointment to the CAS Dean along with the RTP Committee's evaluation and recommendation. The reappointment review otherwise follows the process at the CAS Dean and Provost levels described under Section 3.7.1. of the UTC Faculty Handbook.

In a tenure-track faculty member's mid-probationary review year (i.e., typically the third year of the probationary period), the RTP Committee shall conduct a full review and evaluation (Enhanced Tenure-Track Review or ETTR) of the faculty member's progress towards tenure. The RTP Committee shall provide to the Department Head a written report that will contain a list of the participating tenured faculty members; suggestions for enhancing the faculty member's progress toward tenure; the majority and minority report, if applicable; the summary anonymous vote on whether the faculty member is progressing satisfactorily toward the grant of tenure; and a recommendation for or against reappointment. Upon receipt of the RTP Committee's report, the Department Head will present and discuss with the faculty member the RTP Committee's report, as well as the Department Head's own written assessment, and develop a plan to address suggested enhancement from the RTP Committee. Copies of the ETTR documents will be given to the faculty member.

After meeting with the faculty member, the Department Head shall submit his or her written recommendation for or against reappointment to the CAS Dean along with the RTP Committee's report and recommendation. The reappointment review for the faculty member's mid-probationary review year otherwise follows the process at the CAS Dean and Provost levels described under Section 3.7.1. of the UTC Faculty Handbook.

3.Tenure and Promotion of Tenure-Track Faculty

The UTC Faculty Handbook provides the following guidelines regarding tenure:

The criteria for appointment and reappointment reflect the basic elements for tenure consideration; however, a positive recommendation for tenure requires demonstrated excellence in performance. Expectations necessarily vary within the respective disciplines of faculty members and in light of the

differing ranks of faculty members. The natures of disciplines are such that they emphasize differing levels of performance and differing mixes and types of research and service. Consequently, the tenured faculty members in the disciplines in which tenure-track faculty members work will recommend the standards, degrees of emphasis, and the appropriate types of research and service required for tenure. The individual standards and criteria for tenure for each academic department must be explicitly laid out in the bylaws of the academic department.

A faculty member, at a minimum, must meet the following criteria necessary for the rank of Associate Professor in order to be granted tenure:

- (1) have a doctorate degree or other terminal degree in his or her discipline or present equivalent training and experience;
- (2) have achieved a reputation as an accomplished teacher;
- (3) have achieved a good record in research, scholarly, or creative activities;
- (4) have an established record of effective participation in professional activities other than teaching and research;
- (5) have demonstrated ability to relate appropriately to students and professional colleagues; and
- (6) have demonstrated excellence in at least one of the three areas of responsibility (i.e., teaching, service, and research) required for full-time faculty status.

An academic department may also establish more specific criteria for tenure in that academic department, subject to the approval of the dean and Provost. After approval by the dean and Provost, the specific criteria for tenure of an academic department shall be published in the bylaws of the academic department. The specific tenure criteria for an academic department shall include and be consistent with the criteria stated in Board policy and the Faculty Handbook as well as any criteria established by the college within which the academic department resides.

The UTC Faculty Handbook provides the following guidelines regarding promotion:

Promotion is recognition of promise and a sign of confidence that a faculty member is capable of greater accomplishments and of assuming greater

responsibilities within UTC. The policy of UTC is to make promotion decisions objectively, equitably, impartially and strictly on the basis of merit.

At UTC, promotion is usually tied to tenure for tenure-track faculty members, as application for tenure is usually linked to application for promotion from the rank of Assistant Professor to the rank of Associate Professor. A tenure-track faculty member at the rank of Assistant Professor must be granted tenure in order to be promoted to the rank of Associate Professor. A tenure-track faculty member initially appointed at the rank of Associate Professor or higher may be granted tenure without receiving a promotion.

Faculty members who wish to be promoted should meet the expectations of the new rank as outlined in the criteria for appointment to rank.

Regarding the rank of Professor, the UTC Faculty Handbook notes the following:

A Professor is expected to:

- (1) have a doctorate degree or other terminal degree in his or her discipline or present equivalent training and experience;
- (2) have achieved and maintained a reputation as an accomplished teacher;
- (3) have achieved and maintained a significant record in research, scholarly or creative activities;
- (4) have achieved and maintained a significant record of effective participation in professional activities other than teaching and research;
- (5) have demonstrated an ongoing ability to relate appropriately to students and professional colleagues; and
- (6) have demonstrated excellence in at least two of the three areas of responsibility (i.e., teaching, service, and research) required for full-time faculty status.

In BGE, we value the diverse strengths of our faculty and the varied needs of our programs. We therefore recognize that faculty in BGE will differ in their work assignments and the relative amount of professional effort devoted to teaching, research, and service. Thus, when evaluating faculty for tenure and/or promotion, the RTP Committee and Department Head shall consider a faculty member's teaching, research, and service assignments. Faculty members should document or describe their relative teaching, research, and service

assignments in their dossier and in their annual EDO reports. For example, BGE faculty who teach more than three (3) preparations, more than ten (10) contact hours, and/or at least double the Delaware norm for student credit hours in a given semester (fall or spring), would be considered as having a higher than average teaching load. Faculty who have higher than average teaching or service assignments should describe their allocation of effort to teaching, research, and service in relation to their work assignments. Likewise, faculty who have lower than average teaching or service assignments (e.g., due to release or reassignment related to grant or publication preparation, managing grants, administrative appointments, teaching and learning fellowships, leaves) should also describe their allocation of effort to teaching, research, and service in relation to their work assignments.

In order to align Departmental and UTC policy, BGE focuses its tenure and promotion evaluations on the following areas: (1) teaching, advising, and mentoring; (2) research/scholarly; (3) service; and (4) collegiality. The tenure and promotion criteria are defined below. As mentioned in the UTC Faculty handbook, a faculty member applying for tenure and promotion to Associate Professor, at a minimum, must have demonstrated excellence in at least one of the three areas of responsibility (i.e., teaching, service, research). A faculty member applying for promotion to Professor, at a minimum, must have demonstrated excellence in at least two of the three areas of responsibility (i.e., teaching, service, research). All faculty applying for tenure or promotion are also expected to have demonstrated collegiality while at UTC. In BGE, faculty are eligible to be promoted to Professor after serving as an Associate Professor for a minimum of five (5) years; that is, faculty in BGE can apply for promotion to Professor while in their fifth year as an Associate Professor in order to be promoted to Professor six years following promotion to Associate Professor.

- a. Teaching, Advising, and Mentoring** – In BGE, evidence of having “achieved a reputation as an accomplished teacher” means the candidate must become an effective teacher at UTC. In BGE, having “achieved and maintained a reputation as an accomplished teacher” means that the candidate has an established and respected reputation as an effective teacher at UTC. BGE considers faculty performance in the classroom, student advising, and research mentoring in the evaluation of teaching performance.

Teaching – A faculty member, at a minimum, must meet the following teaching requirements to be considered for tenure and/or promotion:

- (i) Student evaluation results with median scores of 5.0 or greater for all Course Content and Delivery and Course Instruction questions (scale of 0-7 with 7 being best) on average during the three (3) years prior to tenure consideration.
- (ii) A majority of peer-evaluation ratings of “very good” or “excellent” during the

last two semesters of peer evaluations.

- (iii) Evidence of responding positively to reasonable criticisms offered through student and peer evaluations, by showing a willingness to change and improve.

To demonstrate excellence in teaching, a candidate for tenure and/or promotion must also provide additional evidence of teaching commitment and success. Evidence of excellence in teaching can be demonstrated by some combination of the following: regular student teaching evaluations with median scores greater than six (6); nomination and/or receipt of teaching awards; high quality teaching materials; evidence of updating and developing new courses; unsolicited positive feedback from former students; use or development of innovative teaching methods (e.g., flipped classrooms; experiential learning; recitation section); participation in teaching development workshops or fellowships; authorship on lab manuals; authorship on a textbook; other comparable activities.

Candidates applying for promotion to Professor must also provide evidence demonstrating that they have maintained an established and respected reputation as a teacher.

Advising – A faculty member, at a minimum, must meet the following advising requirements to be considered for tenure and/or promotion:

- (i) Offering sufficient opportunities for student advising, based on CAS and Departmental expectations for availability.
- (ii) A record of maintaining regular, posted office hours.

To demonstrate excellence in advising, a candidate for tenure and/or promotion must also provide additional evidence of advising commitment and success. Evidence of excellence in advising can be demonstrated by some combination of the following: service on advising-related committees; nomination or receipt of CAS, University, or external advising award(s); other comparable activities.

Research Mentoring – A faculty member, at a minimum, must meet the following research mentoring requirements to be considered for tenure and/or promotion:

- (i) Meaningful involvement of an average of one (1) undergraduate or graduate student in research per semester after the first year of employment at UTC. This may include any student participating in an independent study/research course (BIOL/ESC/GEOL 4995, 4997, 4998; GEOL 4800, 4900; ESC 5997, 5998, 5999) and/or involved in the experimental design, collection of data, analysis or manuscript preparation, or curatorial/data archiving work.
- (ii) Complete at least three (3) of the following activities: serving as committee chair for an undergraduate honors student or a graduate student; serving as a committee member for an undergraduate honors student or a graduate student; sponsoring student presentations at meetings; sponsoring grant proposal

submissions by students; awards for faculty sponsored student presentations at meetings; student publications in student or in regional, national or international peer reviewed journals; supervising additional students in meaningful research activities beyond the minimum listed above; other comparable activities.

To demonstrate excellence in research mentoring, a candidate for tenure and/or promotion must also provide additional evidence of research mentoring commitment and success. Evidence of excellence in research mentoring can be demonstrated by some combination of the following: meaningful involvement of an average of more than one undergraduate or graduate student in research per semester; completing more than the minimum number of activities listed above; other activities that reflect excellence in research mentoring.

b. Research and Scholarly Competence -- In BGE, evidence of having “achieved a good record in research, scholarly, or creative activities” means the tenure and promotion candidate must establish an independent and externally recognized research program that involves students at UTC. In BGE, having “achieved and maintained a good record in research, scholarly, or creative activities” means the promotion candidate has established an independent and nationally or internationally recognized research program that involves students at UTC. To be considered for tenure and/or promotion, at a minimum, the following criteria must be met:

- (i) Ongoing research activity: A candidate for tenure and/or promotion must provide evidence of ongoing and productive research activity. The Department values and encourages collaboration. However, all candidates for tenure and/or promotion must develop and successfully lead their own research program, regardless of whether their research program involves collaboration.
- (ii) Three (3) full-length peer-reviewed original research papers published in discipline-appropriate journals (i.e., journals related to the candidate’s area of expertise) and/or maps published by a government agency. One paper or map may be in press at the time of the candidate’s review. For papers, at least one (1) must be published in a national or international journal. A peer-reviewed book chapter may be substituted for one of the three required papers or maps.
- (iii) Externally-funded research grant submissions. A candidate for tenure and/or promotion should be lead PI or co-PI on at least two externally submitted grant pre-proposals or full proposals. If co-PI, a substantial portion of the grant activities and budget must focus on the candidate’s research program. Note: funding of these grants is not a minimum requirement for tenure or promotion consideration.
- (iv) Three (3) presentations given by the tenure or promotion candidate at professional meetings or institutions other than UTC, one of which must be national or international, if funding is available.

To demonstrate excellence in research, a candidate for tenure and/or promotion must also provide additional evidence of research commitment and success. Evidence of

excellence in research can be demonstrated by some combination of the following: presentations at a conference or academic institution other than UTC beyond the minimum requirement stated above; peer-reviewed full-length publications in discipline-appropriate journals, peer-reviewed maps published by a government agency, and/or book chapters in a research book or volume beyond the minimum requirement stated above; editor or co-editor of a scholarly book (not professional editing for service) or an invited special feature or proceedings in a peer-reviewed journal; author or co-author of a research-based book (does not include lab manuals); book review in a peer-reviewed journal; PI on a funded grant from an in-house (intramural) competition (e.g. Faculty Development Grant); author of short publication in a regional, national or international journal (e.g., research note, short commentary, or species list); plenary presentations at scientific conferences; PI or co-PI on a funded research grant; peer-reviewed conference proceedings; other examples of scholarly productivity (e.g. technical report of a finished research project submitted to a granting agency).

When demonstrating excellence in research, it is the candidate's responsibility to provide evidence of the level of quality, effort, peer review, and potential impact of the activities listed above to the RTP Committee and Department Head. Candidates applying for promotion to Professor must additionally describe and provide evidence that they have achieved a national or international reputation as a scholar in their field.

The Department recognizes that some faculty members may have relatively large teaching or service assignments that affect their ability to be research active. Thus, it is important that the Department allow for some flexibility in tenure and promotion expectations for research. The Department will consider the following alternatives to the stated minimum requirements for research above:

- (i) Tenure-track faculty members with higher than average teaching or service loads (e.g., >10 contact hours, >3 preps per semester, and/or more than double the Delaware norm for student credit hours or large administrative assignments) will not be deemed ineligible for tenure or promotion if they fail to meet the minimum requirements outlined above.
 - (ii) A tenure-track faculty member who does not seek external funding to sustain a research program can substitute a grant submission with one (1) additional full-length research publication in a peer-reviewed journal or one (1) additional peer-reviewed map published by a government agency (resulting in an expectation of 4 papers or maps).
- c. **Service** – In BGE, having “achieved a significant record of effective participation in professional activities other than teaching and research” or “achieved and maintained a significant record of effective participation in professional activities other than teaching and research” involves providing service that supports the University mission as an engaged metropolitan university and the research mission of the Department. Candidates for tenure and promotion are expected to actively participate in Departmental committees as assigned by the Department Head as well as provide

service to the University, community, and their profession. At a minimum, candidates for tenure and/or promotion should meet the following requirements:

- (i) Departmental service: Tenure-track faculty members are expected to actively serve on the Departmental committees that they are assigned to each year; the actual number of committee assignments will depend on Departmental needs and number of faculty in the Department.
- (ii) University and Discipline-Appropriate Community Service: Each faculty member will provide service to UTC and the community/region as appropriate given their professional expertise. Candidates for tenure or promotion are expected to participate in a minimum of two (2) University or discipline-appropriate community service activities on average per year. Examples of potential University and community serve include, but are not limited to, the following: active participation in university committees; participation in university events; workshops for UTC students; participation in outreach or volunteer programs with community organizations; mentoring of K-12 students, or discipline relevant presentations at local K-12 schools; submission of grants for community/university service activities; serving as a judge for school, local and regional science fairs; participation in outreach or volunteer programs associated with local schools; other comparable activities.
- (iii) Professional Service: Candidates for tenure or promotion are expected to participate in a minimum of two (2) professional activities on average per year. Examples of professional activities include, but are not limited to the following: participation in professional organizations; membership on a committee or leadership for a professional organization; leadership position in a student (e.g., EDGE) or campus-based scientific organization (e.g., adviser for UTC chapter of Sigma Xi); participation in a professional development activity at a scientific meeting or a regionally or nationally recognized program (e.g., mentoring activity at a professional meeting, attending workshops sponsored by professional organizations, NSF or various regional and national laboratories); reviewer for an academic journal; reviewer for a granting agency; editorial position for an academic journal; host or co-host of a professional meeting or workshop; other comparable examples.

To demonstrate excellence in service, a candidate for tenure and/or promotion must provide additional evidence of service that substantially exceeds the minimum requirements listed above. Additionally, candidates for promotion to Professor are expected to demonstrate leadership in relation to service (e.g., effectively serving as the chair of committees, leading outreach activities, serving on editorial boards, successfully holding an administrative appointment) to demonstrate excellence in service.

- d. Collegiality** -- This criterion expands upon the UTC Handbook criterion requiring “demonstrated ability to relate appropriately to students and professional colleagues”.

In BGE, collegiality consists of a shared decision making process and a set of values which regards members of the Department and other University constituencies as essential for the success of the Department, CAS and University. Central to collegiality is the foundation of academic freedom – the respect for differing opinions and points of view – which welcomes diversity and actively sponsors its opinions. Collegiality between faculty and staff, regardless of rank or status, incorporates mutual respect for similarities and for differences in background, expertise, judgments, assignment responsibilities and visions for the department. Collegiality also consists of an ability to relate with students and a respect for similar and different opinions of students.

In BGE, the candidate for tenure and promotion must be a good citizen of the Department, CAS and University, must interact in a collegial and professional manner with colleagues, staff and students, and must serve as a good role model for students and a good representative of UTC. In turn, members of the RTP Committee are expected to be collegial to candidates for tenure and promotion and promote an environment in which different forms of collegiality can be expressed freely. The department supports a vision that differing viewpoints are valuable and essential to promoting academic freedom.

BGE policy conforms with the CAS vision that collegiality (or the lack thereof) impacts the assessment of performance. For this reason, the departmental faculty is mindful of the statement on collegiality in the CAS Bylaws.

The Department will assess collegiality based on:

- (i) Evaluation of the candidate's Statement of Collegiality in tenure/promotion documents.
- (ii) Evidence that a candidate receiving criticisms regarding collegiality during an annual review has appropriately responded to those criticisms. In the event that concerns are expressed about a candidate's collegiality, the RTP Committee chair must submit these concerns in writing to the candidate and Department Head as part of the candidate's annual review for reappointment. The candidate should arrange a meeting with the Department Head and/or chair of the RTP Committee to discuss the concerns. The candidate is also encouraged to write a response to written criticisms regarding a perceived lack or absence of collegiality, to be submitted to the RTP Committee chair and Department Head. The candidate should also address how s/he addressed these perceived concerns in his/her subsequent annual review or as part of Statement of Collegiality in a tenure or promotion application.

In BGE, the absence or lack of collegiality is defined as substantial evidence of sustained, intentional actions and statements that are detrimental to or interfere with the teaching, scholarly, and service goals of the Department, CAS, or University as well as the physical or mental well-being of students, faculty, and staff. The absence or lack of collegiality shall not be based on civil disagreements over academic issues or personality conflicts that do not result in disruptions to departmental, college, or

university activities or are not detrimental to the physical or mental well-being of students, faculty, and staff.

4.External Review Process for Promotion and Tenure

The Department adheres to University and CAS external review process for promotion/tenure. Details of these policies and procedures are available on the CAS webpage and in the CAS Bylaws and UTC Faculty Handbook.

5.Departmental Tenure Recommendations

The tenure review process set forth in the UTC Faculty Handbook will be followed.

After receiving and reviewing dossiers from each tenure-track faculty member under consideration for tenure, the RTP Committee will hold a preliminary review at which it has an opportunity to request clarifying information from each candidate prior to final consideration and forwarding of recommendations to the Department Head. The RTP Committee's recommendation will be decided upon majority vote (yes or no) of those committee members present and voting. Votes will be cast anonymously. Abstentions are permitted. A quorum of two-thirds (2/3) of the members of the RTP Committee is required for actions to take place. A simple majority ($>1/2$) votes in favor of tenure is necessary to constitute a positive recommendation. The RTP Committee will forward a written recommendation to the Department Head, together with records of the committee membership, attendance at final discussions, and voting results.

After making an independent judgment on the tenure candidacy, the Department Head shall submit a recommendation to the CAS Dean with a written summary explanation of his or her judgment, with a copy provided to the candidate at the same time. If the Department Head's recommendation differs from the recommendation of the RTP Committee, the summary must explain the reasons for the differing judgment, and the Department Head must provide a copy of the summary to the RTP Committee. The RTP Committee may forward a dissenting report to the CAS Dean, with a copy provided to the candidate at the same time.

B. Evaluation and Development by Objectives (EDO)

Evaluation and development by objectives (EDO) occurs annually for all full-time faculty, regardless of appointment classification. EDO requires that each faculty member develop annual Individual Objectives with the advice of the Department Head. At the end of the review period, the faculty member submits an Individual Performance Report Form to the Department Head. The Department Head reviews the Individual Objectives and Individual Performance Report Form and completes an Individual Evaluation Form which includes a determination that the faculty member's performance 1) Meets Expectations for Rank, 2) Needs Improvement for Rank, or is 3) Unsatisfactory for Rank. After reviewing all faculty in the Department, the Department Head then considers recommending faculty for Exceeds Expectations for Rank ratings.

The annual EDO evaluation process and criteria are linked to the long-term efforts toward promotion and/or tenure. While a positive annual reappointment or EDO evaluation for a tenure-track faculty member is usually a reflection of the faculty member's progression toward tenure and promotion and meeting of annual expectations, it is no guarantee that those ultimate decisions will be positive unless the cumulative work over the appropriate period of years meets the expected criteria for tenure/promotion.

An additional review process, called Enhanced Post-Tenure Performance Review (EPPR) Process, is triggered for tenured faculty whose annual review is “Unsatisfactory for Rank” or for faculty who have received two overall annual performance ratings of "Needs Improvement for Rank" during any four consecutive annual performance review cycles. Additional details of EPPR are provided in the UTC Faculty Handbook.

For non-tenure-track faculty, the UTC Faculty Handbook provides the following information regarding evaluation:

“All faculty holding non-tenure-track appointments will be evaluated annually as appropriate to the particular appointment. The department head will evaluate annually all non-tenure-track faculty members holding Teaching, Clinical, or Faculty of Practice appointments within the department. A non-tenure-track faculty member holding a Research appointment will be evaluated by the principal investigator(s) of the research grant or contract, or, if the principal investigator(s) are not able to perform the evaluation, by the department head. Each academic department will be responsible for establishing procedures in the departmental bylaws for the regular review of all non-tenure-track faculty members.

The scope of a non-tenure-track faculty member's evaluation will be determined by the assigned duties specified in the faculty member's appointment letter, and the standards for evaluation should be consistent with the relevant standards of performance for teaching, research, and service as defined at UTC”

The Department will follow the above guidelines regarding the evaluation of non-tenure-track faculty. In addition, when deemed appropriate by the Department Head and CAS Dean, Associate Department Heads in BGE may contribute to the evaluation of non-tenure-track faculty members.

VII. EVALUATIONS OF NON-TENURE-TRACK FACULTY

The UTC Faculty Handbook and CAS Bylaws address non-tenure-track faculty reappointment, promotion, and annual evaluation. Generally, non-tenure-track faculty performance is evaluated within the Department through (1) review by annual EDO by the faculty member, Associate Department Heads and Department Head; (2) reappointment review by the Department Head with optional review by the Non-Tenure-Track Reappointment and Promotion Committee; and (3)

promotion review by the Non-Tenure-Track Reappointment and Promotion Committee and Department Head.

Non-Tenure-Track Reappointment and Promotion Committee discussions and deliberations of departmental colleagues are confidential and should be treated as such. That is, NTTRP Committee discussions and deliberations of candidates must not be shared with anyone outside of the NTTRP Committee members who actively participated in the candidate's review, including sharing information with candidates. If the committee decides it is necessary to communicate with a faculty member concerning his or her candidacy, the communication should be done by the NTTRP Committee chair(s).

A. Reappointment and Promotion

1. Standard Format for Non-Tenure-Track Faculty Reappointment and Promotion Materials

For lecturers seeking optional reappointment evaluation from the NTTRP Committee, a Reappointment Folder should be assembled and provided to the NTTRP Committee at the same time that his/her Individual Performance Report is due. The Reappointment Folder for those on a one-year appointment should consist of the most recent reappointment letter, the EDO evaluation and all student and peer teaching evaluations from the previous academic year. The Reappointment Folder for lecturers on a multi-year appointment should include items from the time of the most recent appointment to the present. For those on a multi-year appointment, reappointment evaluation materials should include the most recent reappointment letter, EDO evaluations, and student and peer evaluations.

For lecturers seeking promotion, a promotion portfolio should be assembled and provided to the NTTRP Committee at the same time that his/her Individual Performance Report is due. The promotion portfolio should be divided into at least three distinct components: (1) teaching and advising; (2) service; (3) collegiality; and if applicable (4) research, scholarship and creative activities. Other materials should be included at the discretion of the candidate, and, if possible, on the advice of the NTTRP Committee. The promotion portfolio shall contain the following elements/sections and be arranged in the following order:

- (1) Title page including faculty name, rank, and date of portfolio submission;
- (2) Table of contents;
- (3) EDO evaluations;
- (4) Teaching and Advising section including:
 - a. Teaching philosophy
 - b. Summary of courses taught for each semester including enrollment
 - c. Student teaching evaluations

- d. Quantitative summary of student teaching evaluations: a tabulation of results of Student Ratings of Faculty
- e. Reflective commentary on student teaching evaluations: a considered response to trends in the student evaluations or legitimate student criticisms and suggestions
- f. Peer-teaching evaluations (if candidate was evaluated by peers within the past 4 years for those seeking promotion to Associate Lecturer and within the past 8 years for those seeking promotion to Senior Lecturer)
- g. Reflective Commentary on peer-teaching evaluations(if candidate was evaluated by peers within the past 4 years for those seeking promotion to Associate Lecturer and within the past 8 years for those seeking promotion to Senior Lecturer): a considered response to trends in the peer evaluations or peer criticisms and suggestions.
- h. Summary of student advising activities: a record of regular advising sessions, letters of recommendation, participation in advisor training, and any other relevant activities
- i. Optional indicators of quality: other evidence of quality teaching (e.g., learning outcome assessments, development of a new or online course, samples of student learning assessments, evidence of student learning, participation in pedagogy training or workshops, etc.) and explanations of how those materials demonstrate effective teaching
- j. Discussion of any other relevant activities, such as student research mentoring

(5) Service section including record of:

- a. Service to Department and University: a record of committee work at department, college, and university levels; participation in faculty senate; record of participation or contribution to the University's programs to enhance diversity, inclusion and/or student learning, and if applicable a description of lab coordination duties and efforts
- b. Professional and public service: a record of membership/participation in professional societies; a record of participation in community affairs as a representative of the University.
- c. Optional indicators of quality: other evidence of quality service

(6) Collegiality statement and evidence demonstrating candidate's ability to relate effectively to students and professional colleagues.

(7) Research, Scholarship, and Creative Activities. This section is not required, but is suggested if the candidate participates in research or other scholarly activities. This section could include (listings of most recent to oldest works):

- a. Peer-reviewed publications
- b. Book chapter or book publications

- c. Non-peer-reviewed publications
- d. Technical reports submitted (e.g., final reports for research grants)
- e. Invited oral presentations at conferences, other universities, etc.
- f. Oral/poster presentations at professional conferences
- g. External and internal grants/contracts awarded
- h. External and internal grants/contracts pending or declined

2.Reappointment of Non-Tenure-Track Faculty

The UTC Faculty Handbook contains the following language concerning the reappointment review process of non-tenure-track faculty:

A non-tenure-track appointment (whatever its duration) may be renewed for a new term pursuant to the reappointment review process described in this section. A non-tenure-track faculty member's reappointment review is combined with his or her annual performance review in the year in which reappointment is under consideration.

The department head is responsible for the careful evaluation of the faculty member in determining whether to recommend reappointment for a new term. Reappointment recommendations will include consideration of available funding and the faculty member's performance. A non-tenure-track appointment may be, by its nature, funding-limited; the compensation amounts for the position may be funded through a grant, contract, or restricted donation, and it may automatically expire when funding lapses.

The department head will make a recommendation regarding reappointment to the dean. The dean will consider the department head's recommendation and make a recommendation regarding reappointment to the Provost. The Provost will consider the recommendation of the dean and make a final decision regarding reappointment.

The Provost shall provide the faculty member notice of his or her decision in writing. If the Provost decides not to reappoint a non-tenure-track faculty member, the Provost, whenever feasible, should give the faculty member at least (a) one month's written notice of termination of the faculty member's employment or (b) salary equivalent to that which would be paid in the event of one month's notice of the termination of the faculty member's employment.

The Department will follow the reappointment review process described above for non-tenure-track faculty members. However, in any year that a non-tenure-track faculty member is applying for reappointment, they may request for the NTTRP Committee to provide the initial evaluation for reappointment. Upon such a request, the NTTRP

Committee will review and evaluate the faculty member's performance during the previous appointment period and provide the Department Head with a written evaluation of the faculty member's performance and include a recommendation for or against reappointment. Upon receipt of the NTTRP Committee's evaluation, the Department head will conduct an independent review of the reappointment documents and submit his or her written recommendation for or against reappointment to the CAS Dean along with the NTTRP Committee's evaluation and recommendation.

The evaluation and recommendation regarding reappointment of non-tenure-track faculty members will focus on the annual review materials for that faculty member. Non-tenure-track faculty members applying for reappointment are also welcome to provide additional evidence of excellence in teaching, research and service at their discretion. If additional materials are provided, the NTTRP Committee, when applicable, and the Department Head will consider these additional materials in the evaluation and recommendation regarding reappointment.

3.Promotion of Non-Tenure-Track Faculty

The UTC Faculty Handbook contains the following language concerning the promotion of non-tenure-track faculty:

Each academic department shall establish the criteria and process for evaluating applications for promotion of departmental faculty members holding Teaching appointments, subject to the approval of the dean and Provost. The departmental criteria and process for evaluating promotion decisions shall be consistent with this Faculty Handbook and any criteria established by the college within which the department resides and shall be published in the departmental bylaws.

The CAS Bylaws contain the following criteria for promotion of NTT faculty:

A Lecturer, at a minimum, must meet the following criteria necessary for rank of Associate Lecturer in order for promotion to be granted:

1. have a graduate level degree in his or her discipline or present equivalent training and experience;
2. have achieved a reputation as an accomplished teacher (with a minimum of 4 years at rank of Lecturer or equivalent);
3. have an established record of effective participation in professional activities other than teaching
4. have demonstrated ability to relate appropriately to students and professional colleagues.

An Associate Lecturer, at a minimum, must meet the following criteria necessary for rank of Senior Lecturer in order for promotion to be granted:

1. have a graduate level degree in his or her discipline or present equivalent training and experience;
2. have achieved and maintained a reputation as an accomplished teacher (with a minimum of 8 years at rank of Associate Lecturer or equivalent);
3. have an established record of effective participation in professional activities other than teaching;
4. have demonstrated ability to relate appropriately to students and professional colleagues.

In BGE, we value the diverse strengths of our faculty and the varied needs of our programs. We therefore recognize that non-tenure-track faculty in BGE will differ in their work assignments and the relative amount of professional effort devoted to teaching and service. Thus, when evaluating non-tenure-track faculty for promotion, the NTTRP Committee and Department Head shall consider a non-tenure-track faculty member's teaching and advising and service assignments and other optional indicators of quality provided by the lecturer. Faculty members should document or describe their relative teaching and advising, service, and research (if applicable) assignments in their promotion portfolio and in their annual EDO reports. Non-tenure-track faculty who have higher than average teaching or service assignments should describe their allocation of effort to teaching, research, and service in relation to their work assignments.

BGE focuses its non-tenure-track faculty promotion criteria on the following areas: (1) teaching and advising; (2) service; (3) collegiality; and if applicable (4) research and scholarly competence. The non-tenure-track promotion criteria are defined below.

a. Teaching and Advising – In order to align Departmental and UTC policy, BGE considers faculty performance in the classroom and student advising in the evaluation of lecturer teaching performance. In BGE, evidence of having “achieved a reputation as an accomplished teacher” means the candidate must become an effective teacher at UTC. In BGE, having “achieved and maintained a reputation as an accomplished teacher” means that the candidate has an established a respected reputation as an effective teacher at UTC. BGE considers faculty performance in the classroom and student advising in the evaluation of teaching performance.

Teaching – A lecturer, at a minimum, must meet the following teaching requirements to be considered for promotion:

- (i) Evidence of effective teaching through: a. Student evaluation results with median scores of 5.0 or greater for all Course Content and Delivery and Course Instruction questions (scale of 0-7 with 7 being best) on average during the three (3) years prior to promotion consideration; and, or b. Multiple indicators of

effective teaching. These indicators of teaching quality may include but are not limited to: student assessments, in-class activities, syllabi, learning outcome assessments, evidence of student learning, evidence of efforts to enhance teaching quality, and additional peer observations of teaching approved by the NTTRP Committee. The candidate should provide commentary explaining how these materials demonstrate effective teaching. The NTTRP Committee will determine if the commentary and evidence provided by the candidate demonstrate the ability and commitment to teach effectively.

- (ii) A majority of peer-evaluation ratings of “very good” or “excellent” during the last two semesters of peer evaluations.
- (iii) Evidence of responding positively to reasonable criticisms, offered through any of the following: student evaluations, peer evaluations, the NTTRP Committee, and the EDO process, by showing a willingness to change and improve.

Candidates applying for promotion to Senior Lecturer must also provide additional evidence demonstrating that they have maintained an established and respected reputation as a teacher.

Advising – A faculty member, at a minimum, must meet the following advising requirements to be considered for promotion:

- (i) Offering sufficient opportunities for student advising, based on CAS and Departmental expectations for availability.
- (ii) A record of maintaining regular, posted office hours.

Candidates applying for promotion to Senior Lecturer must also provide additional evidence demonstrating that they have maintained an established record of advising commitment and success.

b. Service – In In BGE, having “achieved a significant record of effective participation in professional activities other than teaching” or “achieved and maintained a significant record of effective participation in professional activities other than teaching” involves providing service that supports the University’s mission as an engaged metropolitan university and the mission of the Department. Candidates for promotion are expected to actively participate in Departmental committees as assigned by the Department Head as well as provide service to the University and their profession. At a minimum, candidates for promotion should meet the following requirements:

- (i) Departmental Service: Non-tenure-track faculty members are expected to actively serve on the Departmental committees that they are assigned to each year; the actual number of committee assignments will depend on Departmental

needs and number of faculty in the Department.

Some lecturers have lab coordination duties. These lab coordination duties are varied and diverse, requiring substantial time dedicated to activities other than teaching and advising. As such, lab coordination duties are recognized as service to the department. Lab coordinators must provide a description of his/her lab coordination duties and evidence of effective execution of those duties.

- (ii) **University and Discipline-Appropriate Community Service:** Each faculty member will provide service to UTC and the community/region as appropriate given their professional expertise. Candidates for promotion are expected to participate in a minimum of two (2) University or discipline-appropriate community service activities on average per year. Examples of potential University and community service include, but are not limited to, the following: active participation in university committees; participation in university events; workshops for UTC students; participation in outreach or volunteer programs with community organizations; mentoring of K-12 students, or discipline relevant presentations at local K-12 schools; submission of grants for community/university service activities; serving as a judge for school, local and regional science fairs; participation in outreach or volunteer programs associated with local schools; other comparable activities.
- (iii) **Professional Service:** Candidates for promotion are expected to participate in professional activities annually. Examples of professional activities include, but are not limited to the following: participation in professional organizations; membership on a committee or leadership for a professional organization; leadership position in a student (e.g., EDGE) or campus-based scientific organization (e.g., adviser for UTC chapter of Sigma Xi); participation in a professional development activity at a scientific meeting or a regionally or nationally recognized program (e.g., mentoring activity at a professional meeting; attending workshops sponsored by professional organizations).

Candidates applying for promotion to Senior Lecturer must also provide additional evidence demonstrating that they have maintained an established record of effective participation in service activities.

c. Collegiality -- This criterion expands upon the UTC Handbook criterion requiring “demonstrated ability to relate appropriately to students and professional colleagues”.

In BGE, collegiality consists of a shared decision-making process and a set of values which regards members of the Department and other University constituencies as essential for the success of the Department, CAS and University. Central to collegiality is the foundation of academic freedom – the respect for differing opinions and points of view – which welcomes diversity and actively sponsors its opinions. Collegiality between faculty and staff, regardless of rank or status, incorporates mutual respect for similarities and for differences in background, expertise, judgments, assignment

responsibilities and visions for the department. Collegiality also consists of an ability to relate with students and a respect for similar and different opinions of students.

In BGE, the candidate for promotion must be a good citizen of the Department, CAS and University, must interact in a collegial and professional manner with colleagues, staff and students, and must serve as a good role model for students and a good representative of UTC. In turn, members of the Non-Tenure-Track Reappointment and Promotion Committee are expected to be collegial to candidates for promotion and promote an environment in which different forms of collegiality can be expressed freely. The Department supports a vision that differing viewpoints are valuable and essential to promoting academic freedom.

BGE policy conforms with the CAS vision that collegiality (or the lack thereof) impacts the assessment of performance. For this reason, the departmental faculty is mindful of the statement on collegiality in the CAS Bylaws.

The Department will assess collegiality based on:

- (i) Evaluation of the candidate's Statement of Collegiality in reappointment/promotion documents.
- (ii) Evidence that a candidate receiving criticisms regarding collegiality during an annual review has appropriately responded to those criticisms. In the event that concerns are expressed about a candidate's collegiality, the Non-Tenure-Track Reappointment and Promotion Committee chair must submit these concerns in writing to the candidate and Department Head as part of the candidate's review for reappointment. The candidate should arrange a meeting with the Department Head and/or chair of the Non-Tenure-Track Reappointment and Promotion Committee to discuss the concerns. The candidate is also encouraged to write a response to written criticisms regarding a perceived lack or absence of collegiality, to be submitted to the Non-Tenure-Track Reappointment and Promotion Committee chair and Department Head. The candidate should also address how s/he addressed these perceived concerns in his/her subsequent annual review.

In BGE, the absence or lack of collegiality is defined as substantial evidence of sustained, intentional actions and statements that are detrimental to or interfere with the teaching, scholarly, and service goals of the Department, CAS, or University as well as the physical or mental well-being of students, faculty, and staff. The absence or lack of collegiality shall not be based on civil disagreements over academic issues or personality conflicts that do not result in disruptions to departmental, college, or university activities or are not detrimental to the physical or mental well-being of students, faculty, and staff.

d. Research and Scholarly Competence -- In BGE, lecturers have no formal research expectations. Even so, some lecturers do engage in research and regularly demonstrate scholarly competence, meaning that they have achieved success and/or a

good record in research, scholarly, or creative activities. These endeavors will be considered “going above and beyond” and are encouraged, as long as the lecturer is also satisfactorily meeting his or her responsibilities in the areas of teaching, advising, and service.

Achieving “success and/or a good record in research, scholarly, or creative activities” means that candidates demonstrate activities, including but not limited to, some combination of the following:

- (i) Participation in ongoing and productive research activity, published original research in discipline-appropriate peer-reviewed journals
- (ii) Presentation of research at professional meetings or respected institutions (either at UTC or at some other location)
- (iii) Submission of one or more external or internal grant proposals.

Any lecturer/candidate exhibiting evidence of having “achieved a good record in research, scholarly, or creative activities” will have done one or more of the preceding in any given semester. **Again, it must be stressed that there is no formal expectation that lecturers must establish an independent and externally recognized research program that involves students at UTC, nor is there any expectation that lecturers must engage in any of the aforementioned activities to be considered for promotion.**

In short, success in research, scholarly activities and/or creative activities will only help the candidate, but will in no way count against the candidate should he or she not participate in such activities. When demonstrating excellence in these areas, however, it is the candidate’s responsibility to describe and provide evidence of the level of quality, effort, peer review, and potential impact of the activities listed above to the NTTRP Committee.

4. Departmental Non-Tenure-Track Faculty Recommendations

After receiving and reviewing portfolios from non-tenure-track faculty members requesting consideration for reappointment, the Non-Tenure-Track Reappointment and Promotion Committee will hold a preliminary review at which it has an opportunity to request clarifying information from each candidate prior to final consideration and forwarding of recommendations to the Department Head. The Non-Tenure-Track Reappointment and Promotion Committee's recommendation will be decided upon simple majority vote (yes or no) of those committee members present and voting. Votes will be cast anonymously. Abstentions are permitted. A quorum of two-thirds (2/3) of the members of the Non-Tenure-Track Reappointment and Promotion Committee is required for actions to take place. A simple majority (>1/2) in favor of reappointment is necessary to constitute a positive recommendation. The Non-Tenure-Track Reappointment and Promotion

Committee will forward a written recommendation to the Department Head, together with records of the committee membership, attendance at final discussions, and voting results.

After receiving and reviewing portfolios from each non-tenure-track faculty member under consideration for promotion, the Non-Tenure-Track Reappointment and Promotion Committee will hold a preliminary review at which it has an opportunity to request clarifying information from each candidate prior to final consideration and forwarding of recommendations to the Department Head. The Non-Tenure-Track Reappointment and Promotion Committee's recommendation will be decided upon majority vote (yes or no) of those committee members present and voting. Votes will be cast anonymously. Abstentions are permitted. A quorum of two-thirds (2/3) of the members of the Non-Tenure-Track Reappointment and Promotion Committee is required for actions to take place. A simple majority in favor of promotion is necessary to constitute a positive recommendation. The Non-Tenure-Track Reappointment and Promotion Committee will forward a written recommendation to the Department Head, together with records of the committee membership, attendance at final discussions, and voting results.

In years that a non-tenure-track faculty member requests to be evaluated for reappointment and promotion, the NTTRP Committee will use the aforementioned process to make two separate recommendations: one recommendation for reappointment and one recommendation for promotion. Failure to obtain a recommendation for promotion does not exclude a candidate from potentially receiving a recommendation for reappointment.

After making an independent judgment on the reappointment or promotion candidacy, the Department Head shall submit a recommendation to the CAS Dean with a written summary explanation of his or her judgment, with a copy provided to the candidate at the same time. If the Department Head's recommendation for reappointment or promotion differs from the recommendation of the Non-Tenure-Track Reappointment and Promotion Committee, the summary must explain the reasons for the differing judgment, and the Department Head must provide a copy of the summary to the Non-Tenure-Track Reappointment and Promotion Committee. The Non-Tenure-Track Reappointment and Promotion Committee may forward a dissenting report to the CAS Dean, with a copy provided to the candidate at the same time. After the CAS Dean receives the departmental recommendations, the non-tenure-track faculty promotion procedure set forth in the Faculty Handbook will be followed.

VIII. EVALUATION OF ADJUNCT FACULTY

Adjunct faculty will be evaluated each year. Evaluation will consist primarily of review of student evaluations of faculty by the Department Head. Should concern arise about the quality of an adjunct instructor, the Department Head, Associate Department Head, or a tenured faculty member may observe the adjunct instructor teaching. When this occurs, the Department Head, Associate Department Head, or tenured faculty member will provide the adjunct faculty with a completed Peer Evaluation of Instruction Form that includes a general rating (excellent, very good,

satisfactory, or unsatisfactory), discussion of strengths and weaknesses, and suggestions to strengthen teaching. Each year, the Department Head will return student evaluations to adjunct faculty and discuss any significant concerns with adjunct faculty at that time. The Department will not rehire adjunct faculty whose performance is determined to be unsatisfactory by the Department Head.

Appendix 4-D Current Full-time Faculty

Dr. David Aborn, Professor

Graduate Faculty: Yes

Education: B.S. in Zoology, Clemson University, 1985; M.S. in Zoology, Clemson University, 1989; Ph.D in Biological Sciences, University of Southern Mississippi, 1996

Years Active for Self- Study: 2018-present

Expertise: Dr. Aborn is interested in many aspects of avian ecology, but particularly bird migration and the effects of urbanization on bird populations. His current research focuses on the suitability of urban greenspaces for birds during migration, but also has projects looking at the wintering ecology of Sandhill Cranes and the breeding biology of Tree Swallows. His research has been funded by various local, state, and Federal agencies, and he has published in regional, national, and international peer-reviewed journals. He has mentored 25 Master's thesis students. He has served on the board of the Association of Field Ornithologists, North American Crane Working Group, Tennessee Ornithological Society, and Chattanooga Audubon Society

Professor Callie Adams, Senior Lecturer, Introductory Biology Coordinator

Graduate Faculty: No

Education: B.S. in Environmental Science, University of Tennessee at Chattanooga, 2006; M.S. in Environmental Science, University of Tennessee at Chattanooga, 2009 - plant conservation genetics

Years Active for Self- Study: 2018-present

Expertise: In her role as Biology Lecture Coordinator, Callie Adams engages with faculty to ensure consistency across all Principles of Biology courses and works with the Biology Laboratory Coordinator to manage General Education recertification efforts for BIOL 1110 and BIOL 1120. She is interested in using innovative teaching practices to enhance student learning and retention. Her teaching focus is introductory biology and environmental science courses and efforts to support student learning (e.g., How to Learn Biology course and Biology Summer Prep Program).

Dr. Jose Barbosa, Professor

Graduate Faculty: Yes

Education: Licenciante in Agronomy, Universidade Central de Las Villas, Villa Clara, Cuba, 1988; M.Sc. Plant Physiology, Auburn University, Auburn, Alabama; Ph.D. Plant Molecular Biology Auburn University, Auburn, Alabama, 2002

Years Active for Self- Study: 2018-present

Expertise: Dr. Barbosa is a Plant Physiologist and Molecular Biologist with interest in understanding plants responses to a myriad of environmental insults. His research focuses on identification and characterization of genes involved in stress responses and their regulations in plants and yeast systems. His current research explores how different metabolic pathways in yeast and Arabidopsis are disturbed by extreme environmental conditions. Furthermore, he is interested in urban agriculture and food

security, which has opened collaboration opportunities with many schools in Hamilton County while trying to improve the involvement of underrepresented groups in STEM fields. These efforts have been supported with external funding from the USDA. Dr. Barbosa teaches Plant Physiology, Genetics, Cell Biology, Soil Resources, and Urban Gardening.

Professor Nominanda Barbosa, Senior Lecturer, Microbiology and Health and Microbiology Prep Lab Coordinator

Graduate Faculty: No

Education: B.S. in Biology, University of Coimbra, Portugal, 1989; M.S. in Soil Fertility, Auburn University Auburn AL, 2000; M.S. in Microbiology, Auburn University, Auburn, AL, 2005.

Years Active for Self- Study: 2018-present

Expertise: As the Microbiology Laboratory Prep Coordinator, Nominanda Barbosa reports to the Biology, Geology and Environmental Science (BGES) Department Head and oversees the day-to-day operations of the Microbiology Preparation Laboratory. This includes responsibility for the supervision, training and evaluation of student laboratory assistants. As Microbiology Laboratory Coordinator, she is responsible for supervising the microbiology science laboratories to ensure faculty access to the microbiological media, cultures and equipment necessary to meet the laboratory competencies of their courses in a safe, clean, and neat environment. She oversees the preparation of microbiology teaching laboratories, including BIOL 2100L, BIOL 4220L, BIOL 4430L, and BIOL 4530L. She assures that all labs meet applicable safety regulations, ensures that the faculty have the materials and equipment needed to properly teach their courses, interacts with the faculty to develop and update laboratory work orders, supervises the ordering of all laboratory supplies, maintains the inventory files and ensures that all prep room chemicals are properly stored and documented; maintains stock cultures for microbiological samples, ensures that all biological specimens, equipment, and other materials are properly stored, ensures that all chemical and biological waste is properly collected, stored, and removed for disposal and ensures that all laboratory equipment and instruments are properly maintained.

Dr. DeAnna Beasley, UC Foundation Associate Professor

Graduate Faculty: Yes

Education: B.S. in Biology, Wofford College, 2002; PhD in Biological Sciences, University of South Carolina at Columbia, 2013

Years Active for Self- Study: 2018-present

Expertise: DeAnna Beasley's research broadly explores the impacts of environmental change on development, behavior and physiology in insect populations and subsequent changes in communities. Human-driven change is of particular interest due to the large scale in which humans have modified the environment and the potential effects on populations' evolutionary trajectory. Her current research explores the implications of urbanization on insect development and biodiversity. Additionally, she is interested in the integration of social and ecological processes to understand urban biodiversity and the development of resilient cities.

Dr. Jennifer Boyd, Guerry Professor

Graduate Faculty: Yes

Education: B.S. in Environmental Science and English (double major), Allegheny College, 1997; M. A. in Earth and Environmental Sciences, Columbia University, 2001; Ph.D. in Earth and Environmental Sciences, Columbia University, 2003. – Plant Ecology

Years Active for Self- Study: 2018-present

Expertise: Jennifer Boyd's research aims to advance understanding of why some species are rare while others are common – an enduring and fundamental question in ecology with important applications for the conservation of biodiversity. Her research interests extend to the process of translating ecological research into effective practices. She leads a multi-institutional research collaboration to assess the ability of rare plant species of the southeastern U.S. to adapt and acclimate to environmental change. Her work has been supported by significant external funding, leverages conservation partnerships with botanical gardens and government agencies, and provides mentored research and experiential learning opportunities for undergraduate and graduate students.

Professor Jeremy Bramblett, Senior Lecturer, Associate Department Head for Student Success

Graduate Faculty: No

Education: B.S. in Geology, The University of Tennessee at Chattanooga, 2000; B.S. in Biology: Organismal Biology with Departmental Honors, The University of Tennessee at Chattanooga, 2010; M.Ed. in Secondary Education: Science and Environmental Studies, The University of Tennessee at Chattanooga, 2005

Years Active for Self- Study: 2018-present

Expertise:

Dr. Amy Brock-Hon, Robert Lake Wilson Professor, Associate Department Head for Geology

Graduate Faculty: Yes

Education: B.S. in Geology, Oklahoma State University; M.S. and Ph.D. (2007) Geoscience, University of Nevada, Las Vegas

Years Active for Self- Study: 2018-present

Expertise: Dr. Brock-Hon's research interests are in the development of late-stage petrocalcic horizons in arid and semi-arid regions, the linkage of geomorphic, tectonic, and paleoclimatic changes to pedogenesis in rare, ancient soils, and the mode and timing of pedogenic silicate clay and barite formation in these soils. She is also interested in large circular depressions atop the Cumberland Plateau. Her recent research includes geomorphic mapping and geophysical surveys to determine their genesis and morphological change over time.

Dr. Jodi Caskey, Senior Lecturer

Graduate Faculty: No

Education: B.S. in Resource Biology and Biodiversity, 1999, University of Louisiana at Lafayette; M.S. in Biology, 2003, University of Louisiana at Lafayette; Ph.D. in Environmental and Evolutionary Biology, 2009, University of Louisiana at Lafayette

Years Active for Self- Study: 2018-present

Expertise: Dr. Caskey's graduate research focused on chemical communication of decapod crustaceans, specifically related to mate recognition. Her background allows her to identify as a marine crustacean biologist. However, she is no longer active in her field and focuses solely on teaching. Her current teaching is focused on Human Anatomy and Physiology, Introductory Biology, Ecology, and Marine Ecology. She is interested in supporting student retention and success by implementing high impact teaching practices.

Dr. Elise Chapman, Associate Lecturer

Graduate Faculty: Yes

Education: B.S. Biology, University of Tennessee, Chattanooga, 2003; M.S. Biology focus in Ecosystems Ecology 2006; Ph.D. in Fluvial Biogeochemistry 2014

Years Active for Self- Study: 2018-present

Expertise: Dr. Chapman's research interests are in aquatic biogeochemistry, catchment hydrology, and water quality assessment. She is specifically interested in understanding the spatial and temporal variability of carbon quantity and quality, nutrient dynamics, and ecological status across diverse aquatic ecosystems and identifying the relevant environmental drivers.

Dr. Stelios Chatzimanolis, UC Foundation Professor

Graduate Faculty: Yes

Education: B.S. in Biology. University of Crete, Greece, 1999; Ph.D in Entomology, University of Kansas, 2004

Years Active for Self- Study: 2018-present

Expertise: Dr. Chatzimanolis is an evolutionary biologist and entomologist interested in documenting earth's biodiversity. He is studying the evolution and systematics of rove beetles, a hyper-diverse group with more than 64,000 described species. He has an active, collections-based research program in species discovery and description of rove beetles, and he combines molecular techniques with morphology and fossils to study their evolutionary relationships. In the past he has used phylogenies to ask questions about the evolution of aposematic coloration and sexual structures and he is currently studying the evolution of myrmecophily in xanthopygine rove beetles. A second area of research focus includes beetle faunistics studies on the Tennessee Valley area.

Dr. Hill Craddock, UC Foundation Robert M. Davenport Professor

Graduate Faculty: Yes

Education: B.A. in Fine Arts and Biology, Indiana University, 1983; M.S. in Horticulture, Oregon State University, 1987; Dottorato di Ricerca (PhD) in Colture Arboree (Pomology), University of Torino, Turin, Italy, 1992.

Years Active for Self- Study: 2018-present

Expertise: The major focus of the Dr. Craddock's research is the restoration of *Castanea dentata* to its former position as a component of the southern Appalachian hardwood forest ecosystem. Since 1996, the project has been actively engaged in all aspects of this major restoration attempt, including research on biological control of the chestnut blight disease and the study of restoration ecology. The objective of the UTC chestnut breeding program, in affiliation with The American Chestnut Foundation and other partners, is to select locally adapted, genetically diverse blight-resistant chestnuts trees. We plan to reintroduce the trees into the forest in an ecologically acceptable manner. Recent advances in plant pathology and molecular biology, especially new recombinant DNA technologies, allow us to confidently predict a successful outcome for our endeavor. We maintain an archive of folklore, historical, artistic and scientific material on American chestnut that is open to scholars and researchers. We strive to educate the general public and hope to contribute to scientific knowledge by conducting research, fostering science-based learning and sharing among disciplines. The project currently supports graduate research assistants and provides opportunities for undergraduate research as well.

Professor Sarah Farnsley, Associate Lecturer

Graduate Faculty: No

Education: B.S. in Communications, University of Tennessee, Knoxville, 2004; B.S. in Ecology and Evolutionary Biology, University of Tennessee, Knoxville, 2010; M.S. in Environmental Science, University of Tennessee, Chattanooga, 2014

Years Active for Self- Study: 2018-present

Expertise: Sarah Farnsley serves as the Coordinator for the online Life on Earth (BIOL 1050) lecture and lab courses, which provide a General Education Natural Science course with a lab to students that are non-majors. Her teaching includes courses such as World Resources, Conservation of Biodiversity, First Year Experience, and introductory Biology and Environmental Science courses. Sarah also serves as one of the Faculty Advisors for the departmental Residential Learning Community: Sustainable Mocs.

Professor Mary Feely, Visiting Lecturer

Graduate Faculty: No

Education: B.S. Biology, Chemistry Minor Maryville College, 2015. MSc in Environmental Science, University of Tennessee, Chattanooga 2019

Years Active for Self- Study: 2022-present

Expertise: Mary Feely is a visiting Lecturer for Introductory Biology courses. Mary's focus is avian ecology and evolutionary biology but her research experience also includes coral reef surveys and

small mammal sampling. Outside of teaching, Mary has worked as an editor including serving as the Managing Editor for Applied Environmental Education and Communication.

Dr. Jannatul Ferdoush, Assistant Professor

Graduate Faculty: Yes

Education: B.S in Genetic Engineering and Biotechnology, University of Chittagong, Bangladesh. 2011; M.S in Genetic Engineering and Biotechnology, University of Chittagong, Bangladesh. 2013; Ph.D in Molecular Biology, Microbiology and Biochemistry, School of Medicine, Southern Illinois University Carbondale, IL, USA. December, 2019.

Years Active for Self- Study: 2022-present

Expertise: Dr. Jannatul Ferdoush joined BGE department as an Assistant Professor of Genetics in Fall 2022. Dr. Ferdoush is a molecular biologist . Her research is focused on understanding the regulation of eukaryotic gene expression. She has published nine research articles in peer-reviewed journals. She teaches classes in Genetics ,Virology and Molecular Genetics.

Dr. Tim Gaudin, UC Foundation Professor

Graduate Faculty: Yes

Education: B.S. in Zoology, The University of Georgia, 1987. Ph.D. in Organismal Biology & Anatomy, The University of Chicago, 1993.

Years Active for Self- Study: 2018-present

Expertise: Dr Gaudin is a UC Foundation Professor who teaches courses in the areas of Vertebrate Zoology, Mammalogy, Evolution, and Human Anatomy. He has been actively involved in sponsoring student research at UTC, including over 140 undergraduates, 9 Honors students, and 9 graduate students. His research expertise lies in the area of mammalian systematics, paleontology, and evolution. More specifically, he is an expert on edentate mammals, i.e., armadillos, anteaters, sloths and pangolins. He has authored or co-authored over 150 scientific publications, including 70 peer-reviewed research articles in professional journals, and co-edited one book. He has been a reviewer for more than 50 different scientific journals, granting agencies, and textbooks, and is an Associate Editor for the Journal of Mammalian Evolution, and current president of the Society for the Study of Mammalian Evolution.

Dr. David Giles, Associate Professor

Graduate Faculty: Yes

Education: B.S. in Biology, Maryville College, 2001. Ph.D. in Biomedical Sciences: Microbiology, East Tennessee State University, 2008

Years Active for Self- Study: 2018-present

Expertise: Dr. Giles is a microbiologist with expertise in microbial pathogenesis, employing biochemistry, molecular biology, bioinformatics, and microbiological techniques to investigate how bacteria sense and respond to environmental fatty acids. With over 80 undergraduate research trainees,

28 students have been co-authors on peer-reviewed publications and 9 have completed departmental honors theses. Dr. Giles teaches Microbiology, Cellular Biology, Human Infectious Diseases, and a course on the epidemiology of disease.

Dr. Loren Hayes, Professor, Associate Department Head for Biology and Environmental Science

Graduate Faculty: Yes

Education: B.S. in Biology, Bates College, 1996. M.S. in Zoology, Michigan State University, 1999, Ph.D. in Zoology, Miami University (Ohio), 2004.

Years Active for Self- Study: 2018-present

Expertise: Dr. Hayes is a behavioral ecologist with interests in the evolutionary significance of group-living and diversity of social systems across mammals. His student-focused research program involves projects in Chile and France and is supported by the National Science Foundation. He co-hosts an international seminar series with >700 followers and integrates research into his primary courses, Animal Physiology and Behavioral Ecology.

Dr. A.K.M. Azad Hossain, Associate Professor

Graduate Faculty: Yes

Education: B.Sc. in Geology, University of Dhaka, 1995. M.Sc. in Geology, University of Dhaka, 1998. M.S. in Engineering Science (Geological Engineering), University of Mississippi, 2004. Ph.D. in Engineering Science (Geological Engineering), University of Mississippi, 2008.

Years Active for Self- Study: 2018-present

Expertise: Dr. Hossain is an environmental geoscientist with expertise in geospatial technology. The general focus of his research interests is in the geological and environmental applications of GIS, remote sensing (optical and microwave), and spatial analysis coupled with numerical modeling. Dr. Hossain developed his research laboratory 'Geological and Environmental Remote Sensing Laboratory (GERSLab)' at the University of Tennessee at Chattanooga (UTC). His current research is focused on developing remote sensing (satellite observations) and GIS-based models to estimate surface water quality, mapping and monitoring urban growth, understanding urban heat island (UHI) impacts, and predicting landslides. Dr. Hossain taught a variety of courses including Geographic Information Systems (GIS), Remote Sensing, Spatial Analysis, Spatial Decision Support Systems, Remote Sensing of the Environments, Radar Remote Sensing, Oceanography, Physical Geology, Historical Geology, Environmental Geology, and Engineering Analysis. Dr. Hossain published 17 peer reviewed articles, 7 invited book chapters, and 21 conference proceedings articles. He delivered 56 oral presentations and 48 poster presentations at different international, national, regional, and local conferences. He served as a PI and a Co-PI on several internal and externally funded research projects. Dr. Hossain received 14 internal grants totaling \$350,182 as PI and Co-PIs, and 6 external grants totaling \$2,040,836 as PI, Co-PI, Co-I, and senior personnel.

Professor Caitlin Jarvis, Visiting Lab Coordinator (Lecturer)

Graduate Faculty: No

Education: B.S. in Wildlife and Fisheries Science, The University of Tennessee, 2014. M.S. in Environmental Science, The University of Tennessee, 2023.

Years Active for Self- Study: 2023-present

Expertise: Coordinator of Introductory Biology Labs-30 sections/semester on average (BIOL 1110L and BIOL 1120L): Responsible for purchasing supplies and equipment for all sections; updating lab manuals; coordinating/overseeing laboratory instructors, which includes 10 graduate teaching assistants per semester, as well as adjunct faculty and lecturers; maintaining labs to be able to accommodate 30 sections of labs per semester. Responsible for teaching three lab sections in fall and spring semesters.

Professor Katherine E. Kinnear, Senior Lecturer, Anatomy and Physiology Lab Coordinator

Graduate Faculty: No

Education: B.S. in Molecular Biology, B.A. English Literature, Virginia Tech, 2002; M.S. in Animal & Veterinary Science, Developmental Physiology, Clemson University, 2009. – Teaches Human Physiology and Functional Human Anatomy and coordinates the labs for those courses.

Years Active for Self- Study: 2018-present

Expertise: Katherine Kinnear is a physiologist whose graduate research characterized the effects of estrogen on the histological changes in mammary development in prepubertal Holstein calves. As Lab Coordinator for Anatomy labs and Physiology labs, Katherine Kinnear oversees the day-to-day operation of the BIO2060L and BIO2080L labs, which includes supervising the undergraduate teaching assistants. She teaches Functional Human Anatomy lecture and Human Physiology lecture, as well as Wildlife Rehabilitation and Education. She is interested in pre-professional student development and education, as well as human dimensions of wildlife conservation. Katherine is licensed with the TWRA as a volunteer Class II wildlife rehabilitator and volunteers with a local non-profit Marshall Creek Wildlife Rehabilitation and Conservancy. She has been a guest speaker for several student organizations and community groups.

Dr. Hope Klug, Guerry Professor

Graduate Faculty: Yes

Education: Ph.D in Zoology, University of Florida, 2007; B.S. in Zoology, University of Florida, 2011

Years Active for Self- Study: 2018-present

Expertise: Dr. Klug is an evolutionary ecologist who aims to understand diversity in animal behavior from an ultimate perspective. She uses a combination of theoretical, computational, and empirical tools to advance and test theory. Much of her empirical research involves fish species, and she also regularly develops and analyzes mathematical models of evolution. Dr. Klug's research program is highly collaborative, and she involves undergraduate students in all aspects of her research. Dr. Klug was Interim Department Head of BGE from August 2018 through December 2019.

Dr. Francesca Leasi, UC Foundation Assistant Professor

Graduate Faculty: Yes

Education: M.S. in 2002 at Ph.D. in 2007 at the University of Modena and Reggio Emilia (Italy)

Years Active for Self- Study: 2018-present

Expertise: Dr. Leasi is an evolutionary ecologist with a primary research focus on investigating patterns of diversity and distribution of populations, species, and communities across diverse ecological and spatial scales. Dr. Leasi adopts an integrative approach, such as molecular, morphological, and computational tools to enhance our understanding of taxonomic, genetic, phylogenetic, and functional biodiversity, with a particular emphasis on small-sized invertebrates (meiofauna). Among different research projects, Dr. Leasi is currently working on the biodiversity of freshwater habitats in the Southeastern United States, with a specific focus on anthropogenic stressors. A great portion of Dr. Leasi's research is focused on the meiofauna of marine environments.

Professor Katherine Ludwig, Geology Lab Teaching Specialist

Graduate Faculty: No

Education: B.A. in Geology from Augustana College, Rock Island, IL; M.S. in Geology from University of Missouri - Columbia

Years Active for Self- Study: 2022-present

Expertise: Katherine Ludwig's scientific interests include the development of mountain ranges and fault systems, particularly focusing on the application of geochronologic and thermochronologic methods to answer research questions. Her current research focuses on the interactions of faults and timing of deformation in southeastern California. She teaches lab courses of Physical Geology (1110L) and Earth and the Environment (1105L).

Dr. Ashley Manning-Berg, Assistant Professor

Graduate Faculty: Yes

Education: B.S. in Geology, University of West Georgia; M.S. in Geology, The University of Tennessee at Knoxville; PhD in Geology, The University of Tennessee at Knoxville

Years Active for Self- Study: 2019-present

Expertise: Dr. Manning-Berg is a sedimentologist, interested in studying ecosystems in tidal environments on early Earth. Her research goals include understanding the effect of organisms on their chemical environment, and the extent to which those organisms are preserved in chemical matrices, such as evaporite, carbonate, and silica mineral phases. Much of her research involves field work, acutalistic taphonomy experiments, geochemical tests to determine what is preserved (i.e., ESEM-EDS, XRD, XRF, FTIR, EA-iRMS, and GC-MS-MS), as well as some geochemical modeling. The results of her research are used to constrain the environmental conditions of tidal environments, inform major transitions in the chemistry of the marine environment, and to determine whether such environments are analogous to potentially habitable (or previously habitable) extraterrestrial environments on Mars. She has recently started to investigate the transport and deposition of microplastic particles in local rivers and to explore the concentrations and possible sources of microplastic pollution in Racoon Mountain Caverns. Dr. Manning-Berg teaches Paleontology, Sedimentology and Stratigraphy, Astrobiology, Oceanography, Global Climate Change: Past, Present, and Future, Physical Geology, and

rotates to teach the Geology Seminar and Research Capstone courses. She is also the coordinator for the College of Arts and Sciences (CAS) Residential Learning Community (RLC) called CAS General (soon to be CAS Explorers).

Professor Monica Miles, Associate Lecturer

Graduate Faculty: No

Education: B.S. in Biology: Organismal, University of Tennessee at Chattanooga, 2016; M.S. in Environmental Science, University of Tennessee at Chattanooga, 2018 - mammalian social evolution

Years Active for Self- Study: 2018-present

Expertise: Monica Miles teaches a rotating schedule of Principles of Biology I and III, Conservation of Biodiversity, Ecology, Evolution, and Ecology Laboratory. She is interested in supporting student success and retention through the implication of dynamic and innovative teaching. Her graduate research focused on the evolution of social organization in artiodactyls.

Dr. Brad Reynolds, Senior Lecturer, BS ESC Coordinator

Graduate Faculty: Yes

Education: Ed.D. Learning and Leadership, UT Chattanooga , December 2013; M.S. Environmental Science, UT Chattanooga, August 2003; B.S. Chemistry, Tennessee Wesleyan College, May 1996.

Years Active for Self- Study: 2018-present

Expertise: Dr. Reynolds earned a B.S. in Chemistry from Tennessee Wesleyan College in 1996. He then taught chemistry laboratory for five years at Chattanooga State Technical Community College. While working at Chattanooga State, he pursued an M.S. in Environmental Science at the University of Tennessee at Chattanooga (UTC). He completed his M.S. degree in 2003. His project, a mixture of law and policy and toxicology, focused on Chattanooga Creek and on the contamination of surrounding residential areas. In 2004, he joined the UTC Department of Biology, Geology and Environmental Sciences as a faculty member (he is now a Senior Lecturer of ESC and the Undergraduate ESC Coordinator). Dr. Reynolds went on to pursue and complete (in 2013) a Doctorate of Education in Learning and Leadership. His dissertation research revolved around reptiles and amphibians, and investigated the impact of transformational leadership, experiential learning, and reflective journaling on the conservation ethic of non-science majors. His interests include conservation, herpetology, environmental ethics, environmental education, environmental leadership, and transformational leadership. Currently, Dr. Reynolds teaches Conservation of Biodiversity (Bio/ESC 1100), Introduction to Environmental Science I Lecture and Lab (ESC 1500), and Introduction to Environmental Science II Lecture and Lab (ESC 1510). Dr. Reynolds also co-teaches Tropical Ecology (ESC/Bio 4999) with Dr. David Aborn. Dr. Reynolds teaches Values and the Environment (ESC 4840) every Spring. He likewise has experience teaching ESC 4070 Environmental Conservation.

Dr. Sean Richards, UC Foundation Professor

Graduate Faculty: Yes

Education: 2000, Ph.D., Environmental Toxicology, Texas Tech University; 1995, M.S., Occupational and Environmental Health, The University of Arkansas for Medical Sciences; 1992, B.Sc., Biology, Arkansas Tech University

Years Active for Self- Study: 2018-present

Expertise: Over the last 25 years Dr. Richards has conducted research on the exposure and effects of multiple toxicants on organisms ranging from bacteria to humans. These toxicants include herbicides, insecticides, pharmaceuticals, Bisphenol A, Poly Aromatic Hydrocarbons, Per- and Polyfluoroalkyl Substances, metals, and Poly Chlorinated Biphenyls. Dr. Richards also has experience with the laws and regulations which govern exposure to toxicants through air, soil, and water. Most recently, Dr. Richards has focused on metabolomics. Specifically, the alterations of metabolomes in response to toxicants or in populations of humans affected by endometrial cancer, congenital malformations, endometriosis, polycystic ovarian syndrome, and fetal central nervous system anomalies. The goal of his research is to determine specific biochemical pathways associated with the affected populations. Ultimately, understanding the changes in the metabolome as a result of disease or intoxication can lead to early detection and personalized treatments. Dr. Richards' overall efforts and collaborations have resulted in >60 peer-reviewed publications and >100 international presentations involving dozens of students.

Dr. Ritu Sharma, Visiting Assistant Professor

Graduate Faculty: No

Education: B.Sc. Biochemistry 2000, Government Medical College, India

M.Sc. Biochemistry 2002, Government Medical College, India

Ph.D. Molecular Biology and Biochemistry 2007, Guru Nanak Dev university, India

Postdoc Biological Sciences 2013-2014, University of Delaware, USA

Years Active for Self- Study: 2023-present

Expertise: Dr. Sharma is a Visiting Assistant professor in Biology having extensive experience of teaching diverse topics of life sciences to both undergraduate and graduate students. She has been professionally active throughout his career serving as Mentor to postgraduate students for their research work, published 23 research papers with 3 best paper awards and several paper presentations at scientific conferences. Her research interests include conducting studies on the potential risk factors for cardiovascular diseases and elucidating the signaling mechanisms.

Dr. Joey Shaw, UC Foundation Professor

Graduate Faculty: Yes

Education: Ph.D. Botany. 2005. University of Tennessee, Knoxville

M.S. Botany. 2001. University of Tennessee, Knoxville

B.S. Biology. 1998. The University of Tennessee at Chattanooga

Years Active for Self- Study: 2018-present

Expertise: Dr. Shaw's research interestes have focused on the vascular flora of Tennessee and plant conservation in the Southern Appalachians. His 33 published articles have included 28 UTC student authors. His published artilces have been cited >5870 times from workers in over 130 countries. He has crafted 28 technical reports for federal or state agencies or private consulting companies and most included UTC students as collaborators or coauthors. His lab has presented 181 professional presentations with 171 UTC student authors at state, regional or national/international meetings and almost all have been oral (19 were invited). Dr. Shaw has been PI or Co-PI on \$2.75 million in funding to UTC. He is currently editing and authoring the Second Edition of the Guide to the Vascular Plants of Tennessee, and he is the editor for the Tennessee-Kentucky Plant Atlas, which serves plant data on ~5000 species. He curates the UTC herbarium of >50,000 specimens. Dr. Shaw is the Director of the Spring Wildflower Pilgrimage in the Great Smoky Mountains National Park, which invites >120 professional biologists, ecologists, naturalists, conservation workers and other specialists to lead outreach and education opportunities on >200 different educational programs over 5 days in April/May each spring. Each year this event attracts ~1000 attendees from a few countries and 35-40 US states.

Dr. Tahmina Shirmeen, Lecturer

Graduate Faculty: No

Education: B. Sc. in Geological Sciences, Jahangirnagar University, 1997; M. Sc. In Geological Sciences, Jahangirnagar University, 2000; M.S. in Geology, University of Mississippi, 2010; M.S. in Engineering Science, Computational Hydroscience and Engineering, University of Mississippi, 2016.

Years Active for Self- Study: 2022-present

Expertise: Tahmina Shirmeen's research interests include flood inundation analysis, hydrologic and hydrodynamic surface water modeling, rainfall-runoff numerical modeling at watershed scales. Her research also focuses on the applications of Remote Sensing (RS), Geographic Information Systems (GIS) and spatial analysis to study the land use land cover change and the impacts of climate change on it. She teaches Geology of the National Parks (GEOL 1025), Physical Geology (GEOL 1110), Earth's Resources and the Environment (GEOL 1040), Oceanography Lecture and Lab (GEOL 2250).

Dr. Rardy Spratt, Professor

Graduate Faculty: Yes

Education: B.S. in Applied Biology, Georgia Institute of Technology, 1977; M.S. in Applied Biology, Georgia Institute of Technology, 1980; Ph.D in Microbiology, Univerisity of Georgia, 1985

Years Active for Self- Study: 2018-present

Expertise: Henry G. "Rardy" Spratt, PhD in Microbiology is a Professor of Biology, Geology, and Environmental Sciences at the University of Tennessee at Chattanooga, where he been since 1994. Dr. Spratt teaches senior- and graduate-level microbiology, immunology, and microbial ecology courses, incorporating laboratory experiences in most. Research interests have ranged from soil microbial processes in wetlands to current projects in clinical microbiology, conducting studies of microbial

contamination of surfaces in healthcare clinics. He has mentored over 40 undergraduate or graduate student, helping them earn Departmental Honors of their M.S. in ESC degrees. He has been professionally active throughout his career, serving as a reviewer for various journals and federal programs, serving on three federal panels. He is the author or editor of 3 books, has published over 25 peer-reviewed scientific articles, and given (with his students) over 120 presentations at scientific conferences.

Dr. Jennifer Taylor, Assistant Professor

Graduate Faculty: No

Education: B.S. in Geosciences, Penn State University, 2017; B.A. in English, Penn State University, 2017; Ph.D in Earth & Environmental Science, University of Minnesota, 2023

Years Active for Self- Study: 2023-present

Expertise: Dr. Taylor is a geologist who combines methods from structural geology, petrology, and thermochronology to investigate questions related to tectonics. Her ongoing research includes studies of quartz deformation, characterizing exhumation related to metamorphic core complex formation and tectonic influences of the Yellowstone hotspot in central Idaho, and investigating glacial incision of West Antarctica. Dr. Taylor is passionate about geoscience communication and outreach, and is excited to engage students in both research and science communication activities.

Dr. John Tucker, Professor

Graduate Faculty: Yes

Education: B.S. Biology, Stetson University; J.D., University of Florida; LL.M. Environmental and Natural Resources Law, Northwestern School of Law, Lewis and Clark College

Years Active for Self- Study: 2018-present

Expertise: John Tucker returned to the faculty ranks in fall 2021 after serving in full time administrative roles for 14 consecutive years (12 years as BGE Department Head, 2 years as Interim Associate Dean of College of Arts and Sciences). His research interests are broad and over the years have included projects, publications and reports relating to riparian habitat protection, environmentally sensitive lands protection, pesticide regulation, land use planning and regulation, air pollution, hazardous wastes, environmental justice, and citizen participation in environmental decisionmaking at local, state, and international levels (Poland and Brazil). He is currently working with students on research projects involving law and policy analysis of the Econlockhatchee River Basin Management and Protection Plan, the Tennessee Interbasin Water Transfer Act permit program, and the 2023 Supreme Court decision in Sackett v. EPA limiting federal authority under § 404 of the Clean Water Act to regulate wetland activities in certain types of wetlands.

Dr. Thomas Wilson, UC Foundation Professor and Director of Environmental Science Graduate Programs

Graduate Faculty: Yes

Education: A.S. in Biological Sciences, College of Lake County, 1990; B.S. in Zoology, Eastern Illinois University, 1992; M.S. in Zoology, Eastern Illinois University, 1994; Ph.D in Environmental Science

and Public Policy, George Mason University, 2002; GISP in Geospatial Sciences, GIS Certification Institute, 2009

Years Active for Self- Study: 2018-present

Expertise: Dr. Wilson is passionate about working with students so they can become independent scientists and forward thinkers. In short, he is a seasoned field biologist who enjoys the outdoors and excels at solving problems in the field. He is comfortable working with a variety of aquatic and terrestrial taxa. Dr. Wilson began his career researching the effects of landscape level changes on free-ranging populations of vertebrates. During this time, he worked with several endangered and threatened (E&T) species from a variety of habitats. Some of these E&T species include Spotted Turtle, Bog Turtle, Wood Turtle, Blanding's Turtle, Timber Rattlesnake, and Eastern Massasauga Rattlesnake. The main focus of this research was tied to demographics, spatial ecology and habitat selection; and, his general interests still lie there today. However, his current research focuses less on E&T species and is more in line with keeping the common species common. Since his arrival at UTC, he have established two long-term studies concerning amphibians and freshwater turtles, and much of this research focuses on population ecology, microhabitat assessment and disease surveillance. He has maintained an interest in solving field related problems, and his background in classical ecological analyses has allowed him to design new methods for measuring and monitoring biodiversity. To this end, he has collaborated with scientists in the public and private sectors in an effort to encourage decision makers to standardize ecological and environmental census techniques. The students working in Dr. Wilson's laboratory are using descriptive, comparative, and experimental studies to answer questions about the ecology of salamanders, frogs, and freshwater turtles at different geospatial scales.

Appendix 4-E Administrators with Tenure in BGE

Dr. Ethan Carver, Collins Professor, Associate Graduate Dean

Graduate Faculty: Yes

Education: B.S. Biology, University of Tennessee, Chattanooga, 1991; Ph.D. in Biomedical Sciences, University of Tennessee-Oak Ridge Graduate School of Biomedical Sciences, 1999

Years Active for Self- Study: 2018-present

Expertise: Dr. Carver is a developmental biologist and comparative molecular biologist interested in developmental pathways that may involve human disease. He has studied early developmental processes associated with germ layer differentiation, skeletal and muscular defects as well as cellular physiology. He has used mice and zebrafish as animal models for human disease as well as human and other mammal cell cultures.

Dr. Hong Qin, Professor, Head of Computer Science

Graduate Faculty: Yes

Education: Ph.D. Biochemistry and Molecular Biology, University of Chicago, December 2001

M.S. Computer Science, Loyola University of Chicago, May 2002

M.S. Biophysics, Tsinghua University, China, May 1994

B.S. Biological Sciences and Biotechnology, Tsinghua University, China, May 1991

Years Active for Self- Study: 2018-present

Expertise: Dr. Hong Qin is a Professor of Computer Science and Biology at the University of Tennessee Chattanooga. He has a Ph.D. from the University of Chicago, an M.S. from Loyola University of Chicago, an M.S. and a B.S. from Tsinghua University. Dr. Qin's research focuses on healthcare equity, computational biology, data science, and machine intelligence. He has organized 21 data science training workshops/bootcamps and successfully applied for 24 external grants, including an NSF CAREER award, totaling ~8.7M. Dr. Qin is a winner of 2022 Healthy Longevity Global Grand Challenge from the National Academy of Medicine recipient and the 2016 recipient of the William A. Hinton Research Training Award from the American Society for Microbiology.

Dr. Joanne Romagni, Associate Professor, Vice Chancellor for Research and Dean of the Graduate School

Graduate Faculty: Yes

Education: Purdue University, 1984 BA Biology; Indiana University of PA, 1994 BA Biology secondary education; Arizona State University, 1998 PhD Plant Physiology/biochemistry

Years Active for Self- Study: 2018-present

Expertise: Dr. Romagni is a plant physiologist and biochemist whose research studies molecular mechanisms of action for secondary plant metabolites. She also works with lichen and lichen secondary

metabolites. Her current research is evolving to include the field of cone shell venomomics working with a group at the University of Cadiz. Her work is highly collaborative including mathematics, organic and analytical chemistry and taxonomy. She has included undergraduates in all of her research.

Appendix 4-F Faculty Who Are No Longer Active

Dr. Fernando Alda, Assistant Professor

Graduate Faculty: Yes

Education: B.Sc in Biology, University of Navarra, 2002; M.Sc. in Biology Complutense University of Madrid-National Museum of Natural Science, 2005; Ph.D. in Biology, Complutense University of Madrid-National Museum of Natural Science, 2009

Years Active for Self- Study: 2019-2023

Expertise: Dr. Alda's research is varied in scope and uses a multidisciplinary approach that combines fieldwork and genomics to understand broad patterns in the diversification of freshwater fishes at different taxonomical and temporal scales. On one hand, his results serve as a basis for testing hypotheses related to the role of geography, ecological adaptation, and life history traits in generating genomic diversity, divergence, and eventually speciation. On the other hand, they allow him to assess the utility of different types of genomic markers for evolutionary studies at multiple scales, and to explore the best bioinformatic strategies for their analysis. Overall, his research program is exemplified by studies that seek to clarify the patterns and processes of fish diversity, while reciprocally addressing contemporary issues in population genomics, systematics, and evolution. In his most recently awarded project, he collaborated with a MS ESC graduate student and other UTC faculty to use metabarcoding technology to examine differences in the gut microbiome of native and nonnative freshwater fishes and investigate the role of the gut microbiome in the invasiveness potential of these species. Dr Alda resigned July 31, 2023 to return to Spain to work as a Tenured Scientist at the Spanish National Research Council.

Dr. Habte Giorgis Churnet, UC Foundation Professor

Graduate Faculty: No

Education: B.Sc. in Geology, Haile Selassie I University, Ethiopia, 1969; M.S. in Geophysics, Leeds University, United Kingdom, 1972; Ph.D. in Geology, University of Tennessee, 1975

Years Active for Self- Study: 2018-2019

Expertise: Dr. Churnet's research interest broadly lies in revealing the origins, formations, and deformation of rocks and economic mineral deposits with emphasis on southeastern USA. Dr. Churnet retired July 31, 2019.

Dr. Stephanie DeVries, Assistant Professor

Graduate Faculty: Yes

Education: B.A. in Art, Grinnell College, 1999; M.S. in Geology, City College of New York, 2010; Ph.D. The CUNY Graduate Center, 2017

Years Active for Self- Study: 2019-2023

Expertise: Dr. DeVries' primary research interest is in the occurrence, fate, and transport of microplastics in streams. In particular, she is interested in optimizing sampling and detection methods used to collect and quantify microplastics across heterogeneous stream sections. Currently, she has one project that is focusing on best practices for rapid quantification of microplastics using Nile Red dye and a second that will test a novel, dual sampling approach for aquatic sample collection and apply it to a stream cross section. The results will be used to determine an optimal sampling matrix based on channel morphology and stream velocity vectors. Recently, she was awarded a USGS 403b grant, administered by the University of Tennessee at Knoxville, to support this work, and she is a collaborating member of a microplastics work group that is organizationally housed at UTK. Dr. DeVries resigned July 31, 2023 to take a job for the State of North Carolina as a hydrogeologist for the Central Coastal Plain Capacity Use Area.

Dr. Ann E. Holmes, Mildred Routt Distinguished Teaching Professor

Graduate Faculty: No

Education: BA in Geology, University of Tennessee at Chattanooga, 1976, M.S. in Geology, University of Alabama, 1981, PhD in Geology, Columbia University, 1996.

Years Active for Self- Study: 2018-2019

Expertise: Dr. Holmes conducted stratigraphic and paleontological research with undergraduate Geology majors, University Honors students, and education majors locally, regionally and internationally (Bahamas). She also co-taught the Tropical Island Ecology and Geology class with Dr. Dawn Ford, developed and taught online Geology classes in Physical Geology & lab 1110 and Geology of National Parks 1025, and was responsible for the scheduling of classes for the Geology Program. Dr. Holmes retired July 31, 2019.

Dr. Margaret Kovach, UC Foundation Professor

Graduate Faculty: Yes

Education: B.A. in Microbiology, Southern Illinois University-Carbondale, 1986; Ph.D. in Microbiology, Colorado State University, 1995. – Molecular pathology of disease

Years Active for Self- Study: 2018-2022

Expertise: Dr. Kovach's primary research interest is in mammalian genomics: the identification and functional characterization of genes. In particular, she is interested in genome organization and chromatin structure and their influences on nuclear functions such as DNA replication, chromosome segregation and gene expression. Currently she has two projects that focus on gene regulatory effects and mechanisms involved in the molecular pathology of cancer and hereditary deafness. She is also involved in a collaborative study with the University of Tennessee College of Medicine investigating the effectiveness of a nanofiber bone repair device for bone regeneration. Recently she has begun a collaboration with the UTC Departments of Biology, Geology & and Environmental Science and Chemistry & Physics to investigate the molecular effects of e-cigarettes on human lung tissue. Dr. Kovach retired July 21, 2022.

Dr. Jonathan W. Mies, Robert Lake Wilson Professor

Graduate Faculty: Yes

Education: B.S. in Geology, University of New Hampshire; M.S. in Geology, University of North Carolina at Chapel Hill; Ph.D. in Geology, University of North Carolina at Chapel Hill

Years Active for Self- Study: 2018-2023

Expertise: In the area of structural geology, Dr. Mies's research interests include shaped structures, e.g. folds, as post-orogenic stress guides in the upper crust, and modern methods of kinematic and stress and strain analysis; in the area of mineralogy, they include powder X-ray diffraction and forensic mineralogy; and in the area of regional geology, they include structure, tectonics, and terrain boundaries of the southern Appalachians. He also has a budding interest in seismology. Dr. Mies retired July 31, 2023.

Dr. Jason Muhlbauer, Lab Coordinator/Teaching Associate of Geology

Graduate Faculty: No

Education: BS.. in Geology, Bucknell University, 2013; M.S. in Geology, UT-Knoxville, 2015; Ph.D in Geology, UT-Knoxville, 2021

Years Active for Self- Study: 2021-2022

Expertise: Dr. Muhlbauer joined the department during the COVID-19 pandemic to manage the physical geology labs. He left the university May 16, 2022 after serving for 18 months in this position.

Dr. Cheryl Murphy, Faculty Associate/Lab Coordinator

Graduate Faculty: No

Education: B.S. Environmental Studies, Biology Emphasis, University of Nebraska-Lincoln, 1996; M.A. Ecology-plant/soil community ecology, University of Kansas, 2004; Ph.D. Ecology-plant/soil community ecology, University of Kansas, 2012.

Years Active for Self- Study: 2018-2023

Expertise: Executes all teaching and research related purchases for the department: Responsible for procurement card purchases and POs; coordinating the shipment and receiving of large equipment delivered and making sure it gets to the correct end location; monthly review of the procurement card statement; consulting and coordinating with Department Accounting Specialist regarding purchases and accounts; Departmental Inventory/Equipment transfers: Responsible for tagging equipment that falls under the Fiscal Policy of Sensitive Minor Equipment (\$1500-4999) and equipment over \$5000; responsible for maintaining a current equipment inventory of tagged equipment; properly transferring equipment to surplus when items are not needed/functioning anymore. Coordinator for equipment and instrument maintenance and repair. Facilities Inventory: Responsible for maintaining a current space inventory/survey; Assigning account numbers (grants/internal grants/payroll), personnel and use to each room in the department. Departmental Safety and Chemical Officer: Responsible for ensuring our department is compliant with safety regulations and chemical hygiene guidelines; keeping Safety Data

Sheets current for all substances in laboratories (teaching and research); properly disposing of hazardous and biohazard waste; maintaining a current chemical inventory list; maintaining current lab safety signs outside of laboratory doors; regularly training faculty and students about safety guidelines; emergency management. Coordinator of Key/Swipe Card Access/Punch Code Access: Responsible for submitting key requests for faculty/staff and for checking out keys to students (and keeping track) when needed. Some rooms require access from a card swipe (Area Access Manager) using their UTC ID – I grant access to those students. Some rooms have a punch code access: Responsible for changing the punch codes every semester and giving the punch code to students when needed. Coordinator of Introductory Biology Labs-30 sections/semester on average (BIOL 1110L and BIOL 1120L): Responsible for purchasing supplies and equipment for all sections; updating lab manuals; coordinating/overseeing laboratory instructors, which includes 10 graduate teaching assistants per semester, as well as adjunct faculty and lecturers; maintaining labs to be able to accommodate 30 sections of labs per semester. Serve on University IACUC Committee. Dr. Murphy resigned this position July 31, 2023 to become the UTC Director of Institutional Research.

Dr. Mark Schorr, Professor

Graduate Faculty: Yes

Education: B.S. in Zoology, Southeastern Louisiana University, 1985; M.S. in Zoology, Mississippi State University, 1988; Ph.D. in Fisheries Ecology/Management, Mississippi State University, 1994

Years Active for Self- Study: 2018-2022

Expertise: Dr. Schorr's primary research interest was stream fish ecology, with an emphasis on water pollution issues and population/community ecology. Graduate and undergraduate students have conducted research to address the following problems: 1) influence of coal mine drainage on stream water chemistry, habitat, and aquatic macrofauna (macroinvertebrates, fishes, salamanders) in the Cumberland Plateau; 2) landscape-stream relationships that involve watershed land use, riparian buffers, limnological parameters, and macrofaunal assemblages in Ridge and Valley catchments; 3) localized effects of road culverts on in stream habitat and fish assemblages in Blue Ridge catchments; 4) lotic macrofaunal responses to stream restoration projects (artificial pools/riffles, constructed channels); and 5) historical and contemporary patterns in the distribution and abundance of the introduced redbreast sunfish (*Lepomis auritus*) and native congeneric sunfishes (*Lepomis* spp.; Centrarchidae) in reservoirs in the Tennessee River drainage. Dr. Schorr passed away in August 2022.

Professor Wayne K. Williams, Lab Coordinator/Teaching Associate of Geology

Graduate Faculty: No

Education: B.S. in Geology, University of Tennessee at Chattanooga, 1979, M.S. in Geology, Memphis State University, 1980.

Years Active for Self- Study: 2018-2020

Expertise: Mr. Williams managed the physical geology labs and helped other faculty with lab coordination. He retired December 31, 2020.

Appendix 4-G

Part-Time Faculty Roster Form

Qualifications of Full-Time and Part-Time Faculty

September 1, 2018 – July 31, 2023

Name of Institution: The University of Tennessee at Chattanooga

Name of Primary Department, Academic Program, or Discipline: Biology, Geology & Environmental Science

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
Courtney Alley (P)	Fall 2020 BIOL 1110L, Principles of Biology I Laboratory, 0	MS, Environmental Science. University of Tennessee at Chattanooga, 2019.	Teaching Qualifications Degree in Discipline
Paul-Erik Bakland (P)	Spring 2019	MS, Environmental Science. University of Tennessee at Chattanooga, 2018.	Teaching Qualifications Degree in Discipline

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
	BIOL 1120, Principles of Biology II, 4 BIOL 3060, Ecology, 3		
David Bechler (P)	Fall 2018 BIOL 4999, Human Biology: An Ecological/Evolutionary Perspect, 3 Spring 2019 BIOL 4999R, Human Biology: An Ecological/ Evolutionary Perspective, 3	PhD, Behavioral Ecology/Biology. Saint Louis University, 1981. MS, Biology. Northeast Louisiana University, 1974.	Teaching Qualifications Degree in Discipline
Meagan Bertoli (P)	Fall 2022 BIOL 1110L, Principles of Biology I Laboratory, 0	BA, Environmental Studies. Maryville College, 2021.	Teaching Qualifications 18 Graduate Credit Hours in Discipline Secondary instructor for BIOL 111OL - Principles of Biology I Laboratory
Gregory Brodie (P)	Fall 2018	MS, Engineering Geology. Purdue University Main Campus, 1979.	Teaching Qualifications Degree in Related Discipline

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
	GEOL 1160, Current Geological Perspectives of Earth, 3 GEOL 1230, Environmental Geology, 4 GEOL 1230L, Environmental Geology Laboratory, 0 Spring 2019 GEOL 1025, Geology of the National Parks, 3 GEOL 1160, Current Geological Perspectives of Earth, 3 Fall 2019 GEOL 1025, Geology of the National Parks, 3 GEOL 1160, Current Geological Perspectives of Earth, 3		

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
	Spring 2020 GEOL 1025, Geology of the National Parks, 3 GEOL 1160, Current Geological Perspectives of Earth, 3 Fall 2020 GEOL 1160, Current Geological Perspectives of Earth, 3 GEOL 1230, Environmental Geology, 4 GEOL 1230L, Environmental Geology Laboratory, 0 Spring 2021 GEOL 1160, Current Geological Perspectives of Earth, 3		

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
	Fall 2021 GEOL 1025, Geology of the National Parks, 3 (UT) GEOL 1160, Current Geological Perspectives of Earth, 3 (UT) Spring 2022 GEOL 1025, Geology of the National Parks, 3 (UT) GEOL 1160, Current Geological Perspectives of Earth, 3 (UT) Fall 2022 GEOL 1160, Current Geological Perspectives of Earth, 3 GEOL 1230, Environmental Geology, 4		

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
	Spring 2023 GEOL 1025, Geology of the National Parks, 3 GEOL 1160, Current Geological Perspectives of Earth, 3		
Kelly Daniels (P)	Spring 2019 BIOL 3350, Evolution, 3	MS, Environmental Science. University of Tennessee at Chattanooga, 2018.	Teaching Qualifications Degree in Related Discipline
Emily Davis (P)	Fall 2022 ESC 1500L, Introduction to Environmental Science I Laboratory, 0 Spring 2023 BIOL 1100, Conservation of Biodiversity, 3	MS, Environmental Science. University of Tennessee at Chattanooga, 2021.	Teaching Qualifications Degree in Discipline

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
Josh Ennen (P)	Spring 2019 ESC 5060, Advanced Ecology, 3 Spring 2020 ESC 5060, Advanced Ecology, 3 Spring 2021 BIOL 4999R, Advanced Ecology, 3 ESC 5010R, Advanced Ecology, 3	PhD, Biological Sciences. University of Southern Mississippi, 2009. MS, Biology. Austin Peay State University, 2005.	Teaching Qualifications Degree in Discipline Degree in Related Discipline
Christina Gibson (P)	Spring 2023 ESC 4999R, Regenerative Design Principles, Processes, and Methods, 3	MS, Landscape Design. The Conway School, 2012.	Teaching Qualifications Degree in Related Discipline Other Qualification

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
			Document Gibson Christina - CV202240-1.pdf
William Helenbrook (P)	Spring 2021 BIOL 3250, Genetics, 3 Spring 2022 BIOL 3250, Genetics, 3 (UT)	PhD, Conservation Biology. The State University of New York College of Environmental Science and Forestry, 2014. MA, Biological Sciences. The State University of New York College at Buffalo, 2006.	Teaching Qualifications Degree in Discipline
Dona Huggins (P)	Fall 2019 BIOL 3070, Ecology Laboratory, 1 Spring 2020 BIOL 3060, Ecology, 3 BIOL 3070, Ecology Laboratory, 1	PhD, Environmental Health Sciences, Toxicology. University of Michigan, 1982. MS, Biology. Florida State University, 1977.	Teaching Qualifications Degree in Discipline
			Teaching Qualifications

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
Melanie Krautstrunk (P)	Fall 2018 GEOL 1110, Physical Geology, 3 Spring 2019 GEOL 1110, Physical Geology, 3 Fall 2020 GEOL 2250, Oceanography, 3 GEOL 2250L, Oceanography Laboratory, 1 Spring 2021 GEOL 1110, Physical Geology, 3 Spring 2022	MS, Geoscience, Hydrogeology. University of Nevada, Las Vegas, 2012.	Degree in Discipline Document Krautstrunk M CV201740-1.pdf

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
	GEOL 1110, Physical Geology, 3 (UT)		
Laura Marsh (P)	Fall 2019 ESC 1500L, Introduction to Environmental Science I Laboratory, 0	MS, Environmental Science. University of Tennessee at Chattanooga, 2015.	Teaching Qualifications Degree in Discipline
Joseph McCauley (P)	Fall 2018 BIOL 1100, Conservation of Biodiversity, 3 BIOL 1130, Principles of Biology III, 3 BIOL 1999, Special Projects, 1 Spring 2019 BIOL 1100, Conservation of Biodiversity, 3	MS, General Biology. Mississippi State University, 2012.	Teaching Qualifications Degree in Discipline

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
	BIOL 1130, Principles of Biology III, 3 Summer 2019 BIOL 1100, Conservation of Biodiversity, 3 BIOL 1999R, Special Projects: Biology I Lab, 1 Fall 2019 BIOL 1100, Conservation of Biodiversity, 3 BIOL 1110, Principles of Biology I, 4 BIOL 1999R, Special Projects, 1 Spring 2020 BIOL 1100, Conservation of Biodiversity, 3		

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
	BIOL 1120, Principles of Biology II, 4 BIOL 1999R, Special Projects, 1 Summer 2020 BIOL 1100, Conservation of Biodiversity, 3 BIOL 4998R, Individual Studies, 1 Fall 2020 BIOL 1100, Conservation of Biodiversity, 3 BIOL 1130, Principles of Biology III, 3 BIOL 1999R, Special Projects: Individual Studies, 1 Spring 2021		

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
	BIOL 1100, Conservation of Biodiversity, 3 BIOL 1130, Principles of Biology III, 3 BIOL 1999R, Special Projects, 1 Summer 2021 BIOL 1100, Conservation of Biodiversity, 3 BIOL 4998R, Individual Studies, 1 Fall 2021 BIOL 1100, Conservation of Biodiversity, 3 (UT) Spring 2022 BIOL 1100, Conservation of Biodiversity, 3 (UT)		

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
	BIOL 1999R, Special Projects, 1 (UT) Fall 2022 BIOL 1100, Conservation of Biodiversity, 3 BIOL 1999R, Special Projects, 1 BIOL 2060L, Functional Human Anatomy Laboratory, 0 Spring 2023 BIOL 1100, Conservation of Biodiversity, 3 ESC 1100, Conservation of Biodiversity, 3 ESC 4998R, Individual Studies, 1 Summer 2023		

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
	BIOL 1100, Conservation of Biodiversity, 3		
Colleen Mikelson (P)	Fall 2018 BIOL 1100, Conservation of Biodiversity, 3 Fall 2019 ESC 1100, Conservation of Biodiversity, 3 Spring 2020 ESC 1100, Conservation of Biodiversity, 3 Spring 2021 ESC 1100, Conservation of Biodiversity, 3	MS, Environmental Science. University of Tennessee, 2011.	Teaching Qualifications Degree in Discipline Degree in Related Discipline

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
	Fall 2021 ESC 1100, Conservation of Biodiversity, 3 (UT) Spring 2022 ESC 1100, Conservation of Biodiversity, 3 (UT) Fall 2022 ESC 1100, Conservation of Biodiversity, 3 Spring 2023 ESC 1100, Conservation of Biodiversity, 3		
Sabrina Novak (P)	Fall 2018 ESC 1100, Conservation of Biodiversity, 3	MS, Environmental Science. University of Tennessee, 2004.	Teaching Qualifications Degree in Related Discipline

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
Matthew Perkins (P)	Fall 2021 BIOL 1110L, Principles of Biology I Laboratory, 0 (UT)	MS, Environmental Science, Biology. UTC, 2010. MS, MS Environmental Science. Univ of Tennessee-Chattanooga.	Teaching Qualifications Other Qualification
Hunter Smith (P)	Fall 2022 BIOL 1110L, Principles of Biology I Laboratory, 0	BS, Environmental Science. University of Mount Union, 2020.	Teaching Qualifications 18 Graduate Credit Hours in Discipline Document 2022 Fall Graduate Teaching Assistant Documentaiton Form - Hunter Smith SIGNED-1.pdf
Eric Tangumonkem (P)	Spring 2022 GEOL 1110L, Physical Geology Laboratory, 1 (UT)	PhD, Geosciences. University of Texas at Dallas, 2008. MS, Earth Sciences. University of Yaoundé I, 2001.	Teaching Qualifications Degree in Discipline
			Teaching Qualifications

Name (F, P)	COURSES TAUGHT Including Term, Course Number & Title, Credit Hours (UN, UT, U, G)	ACADEMIC DEGREES & COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed	OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught
Erin Taylor (P)	Fall 2021 BIOL 1110L, Principles of Biology I Laboratory, 0 (UT)	BS, Environmental Sciences in Agricultural Systems. Mississippi State University, 2017.	18 Graduate Credit Hours in Discipline GTA - Must be co-listed as secondary.

UN, UT, U, G: Undergraduate Nontransferable, Undergraduate Transferable, Undergraduate, Graduate

Appendix 4-H

Department of Biology, Geology, and Environmental Science Peer Evaluation of Instruction Form

Instructor _____ Course _____

Bldg/Room# _____ Hour _____

Date _____ Evaluator _____

Was the presentation primarily:

☐

lecture

☐

discussion

☐

demonstration

☐

lecture/discussion

☐

lecture/demonstration

☐

other: _____

What were the objectives of this class?

Were the objectives addressed?

GENERAL RATING

In comparison with other university presentations in my experience and of a similar type, I would rate this presentation as:

☐

Excellent

☐

Very Good

☐

Satisfactory

☐

Unsatisfactory

Comments of the evaluated instructor:

Signature of Evaluator

Signature of Instructor

Evaluation Criteria	Yes	No	NA*	Comments
1. Instructor showed genuine concern for the learning of his/her students.	☐	☐	☐	
2. Instructor actively encouraged questions and provided ample time for these to occur.	☐	☐	☐	
3. Instructor encouraged class discussion and provided ample time for this to occur.	☐	☐	☐	
4. Instructor organized valuable classroom experiences.	☐	☐	☐	
5. Instructor showed visible respect for all students.	☐	☐	☐	
6. Instructor used instructional materials that promoted learning.	☐	☐	☐	
7. Instructor was tolerant and accepting of student holding different points of view.	☐	☐	☐	
8. Instructor presented course material at an appropriate level of difficulty.	☐	☐	☐	
9. Instructor was intellectually stimulating during presentation.	☐	☐	☐	
10. Instructor demonstrated a thorough knowledge of the course content.	☐	☐	☐	
11. Instructor was well prepared for this presentation.	☐	☐	☐	
12. Instructor described how topics related to each other, and the course as a whole.	☐	☐	☐	
13. Instructor was enthusiastic about helping students learn.	☐	☐	☐	
14. Instructor was an effective speaker during this presentation.	☐	☐	☐	
15. Instructor provided illustrative situations and examples that promoted learning.	☐	☐	☐	
16. Instructor used class time wisely and efficiently to maximize student learning.	☐	☐	☐	
17. Instructor was able to answer student questions effectively.	☐	☐	☐	
18. Instructor exhibited enthusiasm for the discipline.	☐	☐	☐	

*NA: not applicable

If the evaluator had the opportunity to observe the following please comment:

1. Instructor set high, but reasonable, standards for students.
2. Instructor helped students identify important objectives of the course.
3. Instructor was flexible about trying new approaches to help students learn.
4. Instructor provided opportunities for students to obtain assistance outside the classroom (office hours, appointments, etc.).
5. Instructor was appropriately responsive to feedback and/or constructive criticism from students.
6. Instructor described how topics related to other disciplines (if applicable).

Comments and Suggestions:

What characteristics of the instructor and the class did you find strong?

What characteristics of the instructor and the class do you think were weak?

What specific suggestions would you make to this instructor to strengthen his/her classroom performance?

Appendix 4-I: Published Scholarship

1. David Aborn, 2018. Aborn, D. A. Late nesting Killdeer in Hamilton County. *The Migrant* 89:120-121
2. Jennifer Boyd, 2018. Russo L., Boyd J.N. 2018. Comparative development and growth of *Aedes albopictus* in response to native *Quercus rubra* and invasive *Lonicera maackii* leaf litter. *Ecological Entomology* 43: 850–853. DOI: 10.111/ee.12657
3. Stylianos Chatzimanolis, 2018. Chani-Posse, M. R., A. J. Brunke, S. Chatzimanolis, H. Schillhammer, A. Solodovnikov. 2018. Phylogeny of the hyper-diverse Philonthina rove beetles with implications for classification of the tribe Staphylinini (Coleoptera: Staphylinidae). *Cladistics* 38:1-40.
4. Stylianos Chatzimanolis, 2018. Brunke, A. and S. Chatzimanolis. 2018. A revision of *Haematodes* Laporte and *Weiserianum* Bernhauer (Coleoptera: Staphylinidae: Staphylininae: Xanthopygina). *Peerj* 6:e4582
5. Stylianos Chatzimanolis, 2018. Chatzimanolis, S. 2018. A review of the genera *Dysanellus* Bernhauer and *Torobus* Herman (Staphylinidae: Staphylininae: Staphylinini). *The Coleopterists Bulletin* 72(2): 279-291.
6. Timothy Gaudin, 2018. Gaudin, T.J., P. Hicks*, and Y. Di Blanco. 2018. *Myrmecophaga tridactyla* (Pilosa: Myrmecophagidae). *Mammalian Species* 50(956):1-13. *UTC undergrad
7. Timothy Gaudin, 2018. Gaudin, T.J., and J. A. Nyakatura. 2018. Epaxial musculature in armadillos, sloths, and opossums: functional significance and implications for the evolution of back muscles in the Xenarthra. *Journal of Mammalian Evolution*. 25(4):565-572. DOI 10.1007/s10914-017-9402-0
8. Timothy Gaudin, 2018. Boscaini, A., D.A. Iurino, G. Billet, L. Hautier, R. Sardella, G. Tirao, T. J. Gaudin, and F. Pujos. 2018. Phylogenetic and functional implications of the ear region anatomy of *Glossotherium robustum* (Xenarthra, Mylodontidae) from the late Pleistocene of Argentina. *The Science of Nature [Naturwissenschaften]* 105:28. <https://doi.org/10.1007/s00114-018-1548-y>
9. Timothy Gaudin, 2018. Boscaini, A., D. A. Iurino, R. Sardella, G. Tirao, T. J. Gaudin, and F. Pujos. 2018. Digital cranial endocasts of the extinct sloth *Glossotherium robustum* (Xenarthra, Mylodontidae) from the late Pleistocene of Argentina: description and comparison with the extant sloths. *Journal of Mammalian Evolution* (2020) 27(1):55-71. doi.org/10.1007/s10914-018-9441-1
10. Timothy Gaudin, 2018. Boscaini, A., T. J. Gaudin, B. Mamani-Quispe, P. Münch, P.-O. Antoine, and F. Pujos. 2018. New well-preserved craniodental remains of *Simomylodon uccasamamensis* (Xenarthra, Mylodontidae) from the Pliocene of the Bolivian Altiplano: phylogenetic, chronostratigraphic, and paleobiogeographical implications. *Zoological Journal of the Linnean Society* 185:459-486. <https://doi.org/10.1093/zoolinnean/zly075>
11. Timothy Gaudin, 2018. Abstract: Boscaini, A., T.J. Gaudin, B. Mamani-Quispe, P.-O. Antoine, and F. Pujos. 2018. New insights in the evolutionary history of the ground sloth *Simomylodon uccasamamensis* (Xenarthra, Mylodontidae) from the Pliocene of the Bolivian Altiplano. *International Paleontological Convention 5*, Abstract Volume:XX
12. Timothy Gaudin, 2018. Abstract: Gaudin, T.J. A. Boscaini, F. Pujos, B. Mamani-Quispe, and P.-O. Antoine. 2018. New material of the extinct sloth *Simomylodon uccasamamensis* (Xenarthra, Mylodontidae) from the Pliocene of the Bolivian Altiplano: systematic and paleobiological implications. *Society of Vertebrate Paleontology*, Abstract Volume:B162
13. Timothy Gaudin, 2018. Abstract: Boscaini, A., N. Toledo, B. Mamani-Quispe, T.J. Gaudin, y F. Pujos. 2018. Dimorfismo sexual en perezosos extintos: el caso de *Simomylodon uccasamamensis* (Xenarthra, Mylodontidae) del Plioceno de Bolivia. XXXI Jornadas Argentinas de Mastozoología
14. David Giles, 2018. Turgeson, A., R. Boeger, D. K. Giles and B. Harris. 2018. Introducing biochemistry and cellular biology to chemical engineering students by cultivating a bacterial

pathogen in a bioreactor. American Society for Engineering Education-Southeastern Section 2018 Conference Proceedings.

15. David Giles, 2018. Baker, L. Y., C. R. Hobby, A. W. Siv, W. C. Bible, M. S. Glennon, D. M. Anderson, S. J. Symes and D. K. Giles. 2018. *Pseudomonas aeruginosa* responds to exogenous polyunsaturated fatty acids (PUFAs) by modifying phospholipid composition, membrane permeability, and phenotypes associated with virulence. *BMC Microbiology* 18:117. doi: 10.1186/s12866-018-1259-13
16. Loren Hayes, 2018. Hayes, L.D., Correa, L.A., Abades, S., Gao, L., & Ebensperger, L.A. 2019. Male group members are costly to plurally breeding *Octodon degus* females. *Behaviour*. 156, 1-36.
17. Loren Hayes, 2018. Correa, L.A., Leon, C., Ramirez-Estrada, J., Ly-Prieto, A., Abades, S., Hayes, L.D., & Ebensperger, L.A. 2018. Highly masculinized and younger males attain higher reproductive success in a social rodent. *Behavioral Ecology* 29: 628-636.
18. Loren Hayes, 2018. Agnani, P.*, Kauffmann, C., Hayes, L.D., & Schradin, C. 2018. Intra-specific variation in social organization of *Strepsirrhines*. *American Journal of Primatology* 80: e22758.
19. Loren Hayes, 2018. Schradin, C., Hayes, L.D., Pillay, N., & Bertelsmeier, C. 2018 (invited). The evolution of intraspecific variation in social organization. *Ethology* 124: 527-536.
20. Hope Klug, 2018. Klug, H. & Stone, L.*. 2021. More than just noise: Chance, mating success, and sexual selection. *Ecology & Evolution*. 00:1–15. <https://doi.org/10.1002/ece3.7484>
21. Hope Klug, 2018. Klug, H. 2018. Why Monogamy? A Review of Potential Ultimate Drivers. *Frontiers in Ecology and Evolution*, 6:30-36.
22. Francesca Leasi, 2018. Leasi F, Sevigny JL, Laflamme EM, Artois T, Curini-Galletti M, de Jesus Navarrete A, Di Domenico M, Goetz F, Hall JA, Hochberg R, Jorger KM, Jondelius U, Todaro MA, Wirshing HH, Norenburg JL, Thomas WK (2018) Biodiversity estimates and ecological interpretations of meiofaunal communities are biased by the taxonomic approach. *Communications Biology*, 1:112.
23. Jonathan Mies, 2018. Mies, J. W., 2018, A Letter from the Chair. *Saprolite*, Newsletter of the Southeastern Section of the Geological Society of America, Winter 2017-2018.
24. Jonathan Mies, 2018. Beitel, H. R. (student), Churnet, H. G., Hossain, A. A. K., and Mies, J. W., 2018, Characterization of metamorphic zones in the Tennessee Blue Ridge using GIS and digital image processing, *Geological Society of America Abstracts with Programs*, v. 50, n. 3, doi: 10.1130/abs/2018SE-312476.
25. Bradley Reynolds, 2018. Reynolds, B.R., Team Salamander, & Wilson, T. (2018). A Walk in the Woods: Changing Student Attitudes toward Amphibians and Reptiles. *Creative Education*. 09. 182-191. 10.4236/ce.2018.92014.
26. Bradley Reynolds, 2018. Reynolds, B.R., & Wilson, T.P. (2018). Factors Leading to the Selection of an Undergraduate Environmental Science Major. *Journal of the Tennessee Academy of Science*, 93 (3-4), 76-80.
27. Joanne Romagni, 2018. Mottl, T., Igartuburu-Chinchilla, J. M., de los Rios, A., Galindo, J.C.G., Romagni, J.G. (2018 – in preparation). Fatty acid profiles of two phenotypes of the antarctic lichen *Turgidusculum complicatulum*. (*New Phytologist*)
28. Henry Spratt, 2018. Spratt, H. G., Jr., D. Levine, J. Bage, D. K. Giles, and A. G. Collier. 2018. Topical lotions utilized in outpatient rehabilitation clinics as a potential source of bacterial contamination. *Physiotherapy Theory and Practice*. 26:1-8. DOI: 10.1080/09593985.2018.1441935.
29. DeAnna Beasley, 2018. Beasley, D.E., Penick, C.A., Boateng, N.S.*, Menninger, H.L. and Dunn, R.R. (2018). Urbanization disrupts latitude-size rule in 17-year cicadas. *Ecol. Evol.* 00: 1 – 8 <https://doi.org/10.1002/ece3.3879>.
30. Joey Shaw, 2018. Morris, A. and J. Shaw. 2018. Markers in time and space: a review of the last decade of plant phylogeographic methods. *Molecular Ecology* 27, 2317-2333.

31. Thomas Wilson, 2018. Reynolds, B.R., Team Salamander, & Wilson, T. (2018). A Walk in the Woods: Changing Student Attitudes toward Amphibians and Reptiles. *Creative Education*. 09. 182-191. 10.4236/ce.2018.92014.
32. Thomas Wilson, 2018. Reynolds, B.R., & Wilson, T.P. (2018). Factors Leading to the Selection of an Undergraduate Environmental Science Major. *Journal of the Tennessee Academy of Science*, 93 (3-4), 76-80.
33. Thomas Wilson, 2018. Hunt*, N., Carroll, A., and T.P. Wilson. 2018. Spatiotemporal Analysis and Predictive Modeling of Rabies in Tennessee. *Journal of Geographic Information System*: 10:89-110. <https://doi.org/10.4236/jgis.2018.101004>
34. Thomas Wilson, 2018. Smith*, W.H., Hamed, M.K., Burkart, D.A., Hopp, S.L., Wilson, T.P., B.S. Stegenga. 2018. *Aneides aeneus* (Green Salamander)- Habitat. *Herpetological Review* 49(4): 723-724.
35. Sean Richards, 2018. Troisi, J.; Landolfi, A.; Sarno, L.; Richards, S.; Symes, S.; Adair, D.; Ciccone, C.; Scala, G.; Martinelli, P.; Guida, M., A metabolomics-based approach for non-invasive screening of fetal central nervous system anomalies. *Metabolomics*, 2018, 14, (6), 77.
36. Sean Richards, 2018. R. Chianese*, J. Troisi*, S. Richards#, M. Scafuro, S. Fasano1, M. Guida, R. Pierantoni, R. Meccariello. 2018. Bisphenol A in reproduction: epigenetic effects. *Current Medicinal Chemistry*. 25: 1-23
37. Sean Richards, 2018. Jacopo Troisi, Steven Symes, David Adair, Angelo Colucci, Sonia Elisa Prisco, Carmen Imma Aquino, Immacolata Vivone, Maurizio Guida & Sean Richards. 2018. Placental tissue metabolome analysis by GC-MS: oven-drying is a viable sample preparation method, *Preparative Biochemistry and Biotechnology*, Volume 48, Pages 474-482. DOI: 10.1080/10826068.2018.1466151
38. Callie Adams, 2018. Adams, C., Bell, R., Collins, L., Klug, H., Murphy, C., Shaw, J. 2018. *Investigations in Biology Laboratory Manual - BIOL 1110*. Plymouth, MI: Hayden-McNeil. Fifth Edition.
39. Stylianos Chatzimanolis, 2018. Chatzimanolis S., and A. Brunke. 2018. Book Review of: *Handbook of Zoology. Arthropoda: Insecta. Coleoptera, Beetles. Volume 1. Second Edition. Morphology and Systematics (Archostemata, Adephaga, Myxophaga, Polyphaga partim)*. The *Coleopterist Bulletin* 72(1): 138-139.
40. Stylianos Chatzimanolis, 2018. Chatzimanolis, S. 2018. A review of the fossil history of Staphylinidae. In Betz, O., Irmeler U. and Klimaszewski J. (eds.) *Biology of rove beetles (Staphylinidae)*. Springer, pp 27-45.
41. Tahmina Shirmeen, 2018. Jia Y., Shirmeen T., Locke M. A. Lizotte R., and Shields F.D., 2018, *Simulation of Surface Runoff and Channel Flows Using a 2D Numerical Model*, Book chapter: *Soil Erosion*, IntechOpen, ISBN 978-953-51-6769-3.
42. David Aborn, 2019. Aborn, D. A. An extreme case of hatching asynchrony in a pair of Tree Swallows. *The Migrant* 90:8-9
43. Fernando Alda, 2019. Moody EK, Alda F, Capps KA, Puebla O, Turner BL. 2019. Trophic trait evolution explains variation in nutrient excretion stoichiometry among Panamanian armored catfishes (Loricariidae). *Diversity* 11:88.
44. Fernando Alda, 2019. Alda F, Tagliacollo V, Bernt M, Waltz B, Ludt WB, Faircloth BC, Alfaro ME, Albert JS, Chakrabarty P. 2019. Resolving deep nodes in an ancient radiation of Neotropical fishes in the presence of conflicting signals from incomplete lineage sorting. *Systematic Biology* 68: 573-593
45. Amy Brock-Hon, 2019. Brock-Hon, A.L., Morgenthaler, S., 2019. Investigation of limestone and dolomite clast alteration in petrocalcic horizons, southern Nevada, USA: *Geoderma*, v. 342, p. 42-54.
46. Amy Brock-Hon, 2019. Brock-Hon, A.L., Hon, K.D., McCarragher, S., 2019. Geomorphic and geophysical evidence of a collapse origin for large sandstone depressions atop the Cumberland Plateau in Tennessee: *Geomorphology*, v. 343, p. 168-182.

47. Stylianos Chatzimanolis, 2019. Chatzimanolis, S. and A. J. Brunke. 2019. A phylogeny of Xanthopygina (Insecta: Coleoptera) reveals major lineages and the origin of myrmecophily. *Zoologica Scripta* 48: 494-506.
48. Stylianos Chatzimanolis, 2019. Chatzimanolis, S and H. J. Hightower. 2019. *Peripus*, a new genus of Xanthopygina (Coleoptera: Staphylinidae) from South America. *Zootaxa*: 4648(2): 371-383
49. Stylianos Chatzimanolis, 2019. Chatzimanolis, S. 2019. *Lendatus*, a new genus of Xanthopygina (Coleoptera: Staphylinidae: Staphylininae) with description of three new species. *PeerJ* 7:e7947.
50. Stephanie DeVries, 2019. Bradbury, K.R. and DeVries, S. (2019). How Does the Residential Development of Farmland Affect Nitrate in Groundwater?”. *Nelson Issue Brief, Nelson Institute for Environmental Studies*, 1(1), 3-4.
51. Timothy Gaudin, 2019. C.T. Heck, D. Varricchio, T. Gaudin, H. Woodward, and J. Horner. 2019. Ontogenetic changes in the long bone microstructure in the nine-banded armadillo (*Dasypus novemcinctus*). *PLOS One* 14(4): e0215655. doi: <http://dx.doi.org/10.7934/P2750>
52. Timothy Gaudin, 2019. Boscaini, A., T. J. Gaudin, B. Mamani-Quispe, N. Toledo, P.-O. Antoine, and F. Pujos. 2019. The earliest well-documented occurrence of sexual dimorphism in extinct sloths: evolutionary and paleoecological insights. *Zoological Journal of the Linnean Society*. 187:229-239.
53. Timothy Gaudin, 2019. Boscaini, A., F. Pujos, and T. J. Gaudin. 2019. A reappraisal of the phylogeny of Mylodontidae (Mammalia, Xenarthra), and the divergence of mylodontine and lestodontine sloths. *Zoologica Scripta* 48:691-710. DOI: 10.1111/zsc.12376
54. Timothy Gaudin, 2019. Gaudin, T.J., P. Gaubert, G. Billet, L. Hautier, S. Ferreira-Cardoso, and J. R. Wible. 2019. Chapter 1: Evolution & Morphology. Pp. 5-23 In: DWS Challender, HC Nash, and C Waterman (eds.), *Pangolins: Science, Society and Conservation*. Academic Press, New York., 630 pp.
55. Timothy Gaudin, 2019. Gaubert, P., J. R. Wible, S. Heighton, and T.J. Gaudin. 2019. Chapter 2: Phylogeny and Systematics. Pp. 25 – 39 In: DWS Challender, HC Nash, and C Waterman (eds.), *Pangolins: Science, Society and Conservation*. Academic Press, New York, 630 pp.
56. Timothy Gaudin, 2019. Gaudin, T. J., Wible, J. R., Rose, K. D., Emry, R. J., and Spaulding, M. 2019. Skeletal anatomy of the basicranium and auditory region in the metacheiromyid palaeonodont *Metacheiromys* (Mammalia, Pholidotamorpha) based on high-resolution CT scans. *Fossil Imprint*, 75(3-4): 484-503, Praha. ISSN 2533–4050 (print), ISSN 2533–4069 (on-line).
57. Timothy Gaudin, 2019. Abstract: Bramblett, J.L. and T.J. Gaudin. 2019. Using polymer clays to make molds and casts of fossils for teaching and outreach. Abstracts of the Annual Meeting of the Association of Southeastern Biologists, Memphis, TN.
58. Timothy Gaudin, 2019. Abstract: Boscaini, A., N. Toledo, B. Mamani-Quispe, P.-O. Antoine, T.J. Gaudin, y F. Pujos. 2019. Dimorfismo sexual en *Simomylodon uccasamamensis* (Xenarthra, Folivora) y otros perezosos extintos: implicaciones evolutivas. III Reunión Argentina de Biología Evolutiva (Agosto 5-7, 2019), Universidad de Buenos Aires, Buenos Aires, Argentina.
59. Timothy Gaudin, 2019. Abstract: Buchholtz, E. Yozgyur, Weaver, and T.J. Gaudin. 2019. Homology and modularity in the mammalian sternum. 12th International Congress on Vertebrate Morphology, Prague, Czech Republic. [July 2019] *Journal of Morphology* 280(S1):S47.
60. Timothy Gaudin, 2019. Abstract: Boscaini, A., N. Toledo, I.M. Soto, T.J. Gaudin, y F. Pujos. 2019. Filogenia y evolución del tamaño corporal en perezosos mildóntidos (Mammalia, Xenarthra, Folivora). Reunión de Comunicaciones de la Asociación Paleontológica Argentina (Noviembre 27-29), La Plata, Argentina, p. 91.
61. David Giles, 2019. Spratt, H. G., D. Levine, J. Bage, D. K. Giles and A.G. Collier. 2019. Topical lotions utilized in outpatient rehabilitation clinics as a potential source of bacterial contamination. *Physiotherapy Theory and Practice*. 35:163-170.
62. David Giles, 2019. Hobby, C. R., J. L. Herndon, C. A. Morrow, S. J. K. Symes and D. K. Giles. 2019. Exogenous fatty acids alter phospholipid composition, membrane permeability, capacity for

biofilm formation and antimicrobial peptide susceptibility in *Klebsiella pneumoniae*. *MicrobiologyOpen*: e00635.

63. Loren Hayes, 2019. Ebersperger, L.A., Correa, L.A., Ly-Prieto, A., Perez de Arce, F., Abades, S., & Hayes, L.D. 2019. Multiple mating is linked to social setting, and benefits the males in a communally rearing mammal. *Behavioral Ecology*.
64. Loren Hayes, 2019. Foerder, P., Farnsley, S., Hayes, L.D., & Klug, H. 2019. Enrichment for students and animals: Using environmental enrichment programs for undergraduate STEM learning. *Journal of College Science Teaching*. 48: 14-27
65. Hope Klug, 2019. Klug, H. & Bonsall, M.B.B. 2019. Co-evolution Influences the Evolution of Filial Cannibalism, Offspring Abandonment, and Parental Care. *Proceedings of the Royal Society B*. 286: 20191419. <http://dx.doi.org/10.1098/rspb.2019.1419>
66. Hope Klug, 2019. Cronnon, C.T.*, Harris, M., Kuhajda, B., and Klug, H. 2019. Breeding season behavior of *Chrosomus saylori* (Laurel Dace). *Southeastern Naturalist*. 18(3): 373-380.
67. Hope Klug, 2019. Davenport, M.E.*, Bonsall, M.B., & Klug, H. 2019. Unconventional care: Offspring abandonment and filial cannibalism can function as forms of parental care. *Frontiers in Ecology & Evolution*. 7:1-11.
68. Hope Klug, 2019. Foerder, P., Farnsley, S., Hayes, L. & Klug, H. 2019. Enrichment for students and animals: Using environmental enrichment programs for undergraduate STEM learning. *Journal of College Science Teaching*. 48: 14-19.
69. Francesca Leasi, 2019. Martinez A, Di Domenico M, Leasi F, Curini-Galletti M, Todaro MA, Dal Zotto M, Gobert S, Artois T, Norenburg J, Jorger KM, Nunez J, Fontaneto D, Worsaae K (2019) Patterns of diversity and endemism of soft-bodied meiofauna in an oceanic island, Lanzarote, Canary Islands. *Marine Biodiversity*, 49(5), 2033-2055.
70. Jonathan Mies, 2019. Hays, J. A. (student) and Mies, J. W., 2019, A tale of two hurricanes: the peculiar microseisms of Matthew and Florence in Onslow Bay, North Carolina, *Geological Society of America Abstracts with Programs*, v. 51, n. 3
71. Henry Spratt, 2019. Epps, Mathew T., Sarah Langsdon, Taylor K. Pels, Victoria Noyes, David Levine, Todd E. Thurston, Henry G. Spratt, and Mark A. Brzezienski. 2019. Pocket irrigation and technique during reconstructive surgery. *Annals of Plastic Surgery*, 82(6S):S427-S432. DOI: 10.1097/SAP.0000000000001790.
72. Henry Spratt, 2019. Spratt, Henry G., Jr., David Levine, Susan McDonald, Sarah Drake, Katherine Duke, Casey Kluttz, and Kate Noonan. 2019. Survival of *Staphylococcus aureus* on therapeutic ultrasound heads. *American Journal of Infection Control*. 47:1157-1159. <https://doi.org/10.1016/j.ajic.2019.02.019>
73. DeAnna Beasley, 2019. Beasley, D.E., Fitzgerald, J.L.*, Fowler, A.*, Keheler, K.**, Uribe-Lopez, M.M. and Dunn, R.R. (2019). Do bee wings adapt for flight in urban environments? *Southeastern Naturalist*. 18 (2): 183-191.
74. Joey Shaw, 2019. *Powell, C., **J Motley, H. Qin, and J. Shaw. 2019. Born digital: a field-to-database solution for collections-based research using collNotes and collBook. *Applications in Plant Sciences*. 7: e11284.
75. Joey Shaw, 2019. **Krakowiak, A. and J. Shaw. 2019. Vascular plant flora of Orchard Knob Reservation, Hamilton County, Tennessee. *Castanea* 84: 161-178.
76. Joey Shaw, 2019. *Konrade, L., J. Shaw, and J. Beck. 2019. A rangewide herbarium-derived dataset indicates high levels of gene flow in black cherry (*Prunus serotina*). *Ecology and Evolution* 9: 975-985.
77. Joey Shaw, 2019. **Krakowiak, A., *J. Shelton, and J. Shaw. 2019 Noteworthy Collections: An update on the status of *Clematis fremontii* populations in Tennessee. *Castanea* 84:1-3.
78. Hill Craddock, 2019. Hein, K. M., Perkins, M. T., Westbrook, J. W. and Craddock, J.H. (2019). Early Screening to Detect Resistance to *Phytophthora cinnamomi* in Backcross Chinese-American Chestnut Hybrids. *Journal of the American Chestnut Foundation* 33(1), 27-29.

79. Hill Craddock, 2019. Perkins, M.T., Robinson, A.C., Cipollini, M, and Craddock, J.H.. (2019) Identifying host resistance to *Phytophthora cinnamomi* in hybrid progeny of *Castanea dentata* and *Castanea mollissima*. *HortScience* 54(2): 221-225. <https://doi.org/10.21273/HORTSCI13657-18>
80. Sean Richards, 2019. Antonietta Santoro, Rosanna Chianese , Jacopo Troisi, Sean Richards, Stefania Nori, Silvia Fasano, Maurizio Guida, *Elizabeth Plunk, Andrea Viggiano, Riccardo Pierantoni, Rosaria Meccariello, Neuro-toxic and reproductive effects of BPA. *Current Neuropharmacology*. 2019. 17:1109-1132
81. Sean Richards, 2019. Jacopo Troisi, Olga De Castro, Sean Richards, Steven Symes, Viviana Ferretti, Antonietta Di Maio, Angela Amoresano, Bruno Daniele, Francesco Aliberti, Marco Guida, Marco Trifuoggi. 2019. A comparative assessment of metals and phthalates in commercial tea infusions: a starting point to evaluate their tolerance limits. *Food Chemistry*. Volume 288, 2019, Pages 193-200.
82. Sean Richards, 2019. Mikelson C*., J. Troisi , Symes S., Gao, L., DiRe, L.M., Adair D. , Miller, R.K., Richards, S. 2019. Placental concentrations of essential, toxic, and understudied metals and relationships with birth outcomes in Chattanooga, TN. *Environmental Research* Volume 168, January 2019, Pages 118-129.
83. Sean Richards, 2019. J. Troisi, L. Giugliano, L. Sarno, A. Landolfi, S. Richards, S. Symes, A. Colucci, G. Maruotti, D. Adair, M. Guida, P. Martinelli & M. Guida. Serum metabolome in pregnant women and the relationship with congenital malformations of the central nervous system: a case-control study. *BMC Pregnancy Childbirth* 19, 471 (2019). <https://doi.org/10.1186/s12884-019-2636-5>
84. Sean Richards, 2019. J. Troisi, C. Cinque, L. Giugliano, S. Symes, S. Richards, D. Adair, P. Cavallo, L. Sarno, G. Scala, M. Caiazza & M. Guida. Metabolomic change due to combined treatment with myo-inositol, D-chiro-inositol and glucomannan in polycystic ovarian syndrome patients: a pilot study. *J Ovarian Res* 12, 25 (2019). <https://doi.org/10.1186/s13048-019-0500-x>
85. Stylianos Chatzimanolis, 2019. Chatzimanolis, S. 2019. Book Review of: Beetles: The natural history and diversity of Coleoptera. *The Coleopterists Bulletin* 73(2): 380-381.
86. Stylianos Chatzimanolis, 2019. Chatzimanolis, S. 2019. Book Review of: Biodiversity and Evolution. *The Quarterly Review of Biology* 94: 448.
87. Hill Craddock, 2019. Craddock, J.H. and Perkins, M.T. (2019) Chapter 5: Chestnut *Castanea* spp. Miller) Breeding. Pp. 105-156 in: Al-Khayri, J.M., Jain, S.M., and Johnson, D.V. (Eds.). *Advances in Plant Breeding Strategies: Nut and Beverage Crops*. Volume 4. Springer. ISBN 978-3-030-23111-8. DOI: https://doi.org/10.1007/978-3-030-23112-5_5
88. David Aborn, 2020. Aborn, D. A. Double brooding of Tree Swallows in southeast Tennessee. *Wilson Journal of Ornithology* 132:1023-1027
89. David Aborn, 2020. Zimmer, C., C. C. Taff, D. R. Ardia, A. P. Rose, D. A. Aborn, S. L. Johnson and M. N. Vitousek. Environmental unpredictability shapes glucocorticoid regulation across populations of tree swallows. *Nature* <https://doi.org/10.1038/s41598-020-70161-4>
90. David Aborn, 2020. Hudson, A. B.(student), and D. A. Aborn. Seasonal Correlations Between Kudzu and Avian Species Diversity and Abundance in Southeast Tennessee. *Southeastern Naturalist* 19: 161-178
91. Fernando Alda, 2020. Rossi NA, Menchaca-Rodriguez A, Antelo R, Wilson B, McLaren K, Mazzotti F, Crespo R, Wasilewski J, Alda F, Doadrio I, Barros TR, Hekkala E, Alonso-Tabet M, Alonso-Giménez Y, Lopez M, Espinosa-Lopez Georgina, Burgess Joe, Thorbjarnarson JB, Ginsberg JR, Vliet KA, Amato G. 2020. High levels of population genetic differentiation in the American crocodile (*Crocodylus acutus*). *PLoS ONE*15(7): e0235288.
92. Fernando Alda, 2020. García JT, Domínguez-Villaseñor J, Alda F, Calero-Riestra M, Pérez Olea P, Fargallo JA, Martínez-Padilla J, Herranz J, Oñate JJ, Santamaría A, Motro Y, Attie C, Bretagnolle V, Delibes J, Javier Viñuela J. 2020. A complex scenario of glacial survival in Mediterranean and continental refugia of a temperate continental vole species (*Microtus arvalis*) in Europe. *Journal of Zoological Systematics and Evolutionary Research*25: 459-474

93. Fernando Alda, 2020. Faircloth BC, Alda F, Hoekzema K, Burns MD, Oliveira C, Albert JS, Melo BF, Ochoa LE, Roxo FF, Chakrabarty P, Sidlauskas BL, Alfaro ME. 2020. A target enrichment bait set for studying relationships among ostariophysan fishes. *Copeia* 108: 47-60.
94. Jennifer Boyd, 2020. Wiegand T.P., Gentry B., McCoy Z., Tannis C., Klug H., Bonsall M.B., Boyd J.N. 2020. Visualizing connectivity of ecological and evolutionary concepts – an exploration of research on plant species rarity. *Ecology and Evolution* 10: 9037-90447. DOI: 10.1002/ece3.6633
95. Jennifer Boyd, 2020. Wooten S., Call G., Dattilo A., Cruse-Sanders J., Boyd J.N. 2020. Impact of forest thinning and white- tailed deer herbivory on translocation of the rare terrestrial orchid *Platanthera integrilabia*. *Diversity* 12: 412. DOI: 10.3390/d12110412
96. Amy Brock-Hon, 2020. House, P.K., Crow, R.S., Pearthree, P.A., Brock-Hon, A., Schwing, J., Thacker, J., Gootee, B.E., 2020, Surficial Geologic Map of the Spirit Mountain SE and part of the Spirit Mountain NW 7.5' Quadrangles, Nevada and Arizona. USGS Scientific Investigations Map 3448, pamphlet 30p., scale 1:24,000, <https://doi.org/10.3133/sim3448>.
97. Stylianos Chatzimanolis, 2020. Chatzimanolis, S. 2020. Even more new species, additional records, and a revised key for *Philothalpus* Kraatz (Coleoptera: Staphylinidae: Staphylininae). *Zootaxa* 4742(1): 129-138
98. Stylianos Chatzimanolis, 2020. Chatzimanolis, S, W. G. Cofer, H. J. Hightower, M. K. Roy and J. L. Sanders. 2020. New records of beetles (Coleoptera) from the Tennessee Valley of Southeastern USA. *The Coleopterists Bulletin* 74(3): 605-618.
99. Stylianos Chatzimanolis, 2020. Chatzimanolis, S. 2020. On the identify of *Gastrisus modestus* (Bernhauer), with an updated diagnosis and a key for *Dysanellus* Bernhauer (Staphylinidae: Staphylininae: Staphylinini). *The Coleopterists Bulletin* 74(3): 598-600.
100. Stephanie DeVries, 2020. Gomez, A. M., McDonald, K. C., Shein, K., DeVries, S.L., Armstrong, R. A., Hernandez, W. J., & Carlo, M. (2020). Comparison of Satellite-Based Sea Surface Temperature to In Situ Observations Surrounding Coral Reefs in La Parguera, Puerto Rico. *Journal of Marine Science and Engineering*, 8(6), 453.
101. Stephanie DeVries, 2020. DeVries, S. L., Block, K. A., *Loving, M., *Logozzo, L., & Zhang, P. (2020). The effects of trace narasin on the biogeochemical N-cycle in a cultivated sandy loam. *Science of The Total Environment*, 716, 137031.
102. Timothy Gaudin, 2020. Boscaini, A., D. A. Iurino, B. Mamani Quispe, R. Andrade Flores, R. Sardella, F. Pujos, and T. J. Gaudin. 2020. Cranial anatomy and paleoneurology of the extinct sloth *Catonyx tarijensis* (Xenarthra, Mylodontidae) from the late Pleistocene of Oruro, Southwestern Bolivia. *Frontiers in Ecology and Evolution* 8(69):1-16. doi: 10.3389/fevo.2020.00069
103. Timothy Gaudin, 2020. Buchholtz, E.A., Z.M. Yozgyur, A. Feldman, A.A. Weaver, and T.J. Gaudin. 2020. The therian sternum at the lateral somitic frontier: Evolution of a composite structure. *Journal of Zoology*. 315(1):19-28. doi:10.1111/jzo.12809
104. Timothy Gaudin, 2020. Terhune, C. E., S. Curran, R. Croitor, V. Dragusin, T. Gaudin, A. Petculescu, C. Robinson, M. Robu, and L. Werdelin. 2020. Early Pleistocene fauna of the Olteț River Valley of Romania: Biochronological and biogeographic implications. *Quaternary International* 553:14–33. Doi:10.1016/j.quaint.2020.06.020
105. Timothy Gaudin, 2020. Gaudin, T.J., S. Tuckniss*, A. Boscaini, F. Pujos, and G. De Iuliis. 2020. Cranial osteology and taxonomy of *Pronothrotherium* (Xenarthra, Folivora, Nothrotheriidae) from the late Miocene – early Pliocene of Catamarca Province (Argentina). *Publicación Electrónica de la Asociación Paleontológica Argentina*. 20(2): 55–82. doi:10.5710/PEAPA.04.09.2020.320 *UTC undergrad
106. Timothy Gaudin, 2020. Abstract: Allen, J. N.**, T.P. Wilson and T.J. Gaudin. 2020, Habitat suitability modeling for *Lontra canadensis* in southeastern Tennessee. Abstracts of 30th Colloquium on the Conservation of Mammals in the Eastern United States, Athens, GA. **UTC grad student

107. Timothy Gaudin, 2020. Abstract: Gaudin, T.J., K. Smith*, and J.R. Wible. 2020. Osteological anomalies in the narial anatomy of the extant two-toed sloth *Choloepus* and the homology of the internarial bar in some fossil sloths. Society of Vertebrate Paleontology, Abstract Volume. *UTC undergrad
108. David Giles, 2020. Herndon J. L., R. E. Peters, R. N. Hofer, T. B. Simmons, S. J. K. Symes and D. K. Giles. 2020. Exogenous polyunsaturated fatty acids (PUFAs) promote changes in growth, phospholipid composition, membrane permeability and virulence phenotypes in *Escherichia coli*. BMC Microbiol. 20:305. doi: 10.1186/s12866-020- 01988-3
109. Loren Hayes, 2020. Jaeggi, A., Miles, M.*, Festa-Bianchet, M., Schradin, C., & Hayes, L.D. 2020. Variable social organisation is ubiquitous in Artiodactyla and readily evolved from pair-living ancestors. Proceeding of the Royal Society B.
110. Azad Hossain, 2020. Blanton, R. and Hossain, A., 2020, Mapping the Recovery Process of Vegetation Growth in the Copper Basin, Tennessee Using Remote Sensing Technology. GeoHazards, 1, 31-43. <https://doi.org/10.3390/geohazards1010004>.
111. Azad Hossain, 2020. Hall, J. and Hossain, A., 2020, Mapping Urbanization and Evaluating Its Possible Impacts on Stream Water Quality in Chattanooga, Tennessee, Using GIS and Remote Sensing. Sustainability, 12 (5), 1980, 1-46. <https://doi.org/10.3390/su12051980>.
112. Francesca Leasi, 2020. Martinez-Arce A, De Jesus-Navarrete A, Leasi F (2020) DNA barcoding for delimitation of putative Mexican marine nematodes species. Diversity, 12, 107
113. Francesca Leasi, 2020. Curini-Galletti M, Artois T, Di Domenico M, Fontaneto D, Jondelius U, Jorger KM, Leasi F, Martinez A, Norenburg JL, Sterrer W, Todaro MA (2020). Contribution of soft-bodied meiofaunal taxa to Italian marine biodiversity. The European Zoological Journal, 87 (1), 369-384
114. Francesca Leasi, 2020. Leasi F, De SmetWH (2020) Thalassic rotifers from the United States: descriptions of two new species and notes on the effect of salinity and ecosystem on biodiversity. Diversity, 12(1), 28
115. Francesca Leasi, 2020. Curini-Galletti M, Carcupino M, Stocchino GA, Leasi F, Norenburg JL (2020) New species of Duplominona Karling, 1966 (Platyhelminthes, Proseriata) from the Pacific coast of Panama. Zootaxa, 4881(3):3.
116. Jonathan Mies, 2020. Mies, J. W., 2020, Preliminary analysis of hurricane Dorian's microseisms from the Little Bahama Bank through Onslow Bay, North Carolina, with comparisons to hurricanes Matthew and Florence, Geological Society of America Abstracts with Programs, v. 52, n. 2, doi: 10.1130/abs/2020SE-345358.
117. Monica Miles, 2020. Jaeggi, A. V., Miles, M. I., Festa-Bianchet, M., Schradin, C., & Hayes, L. D. (2020). Variable social organisation is ubiquitous in Artiodactyla and readily evolved from pair-living ancestors. Proceedings of the Royal Society B, 287(1926)
118. DeAnna Beasley, 2020. Sealey, B.A., Beasley, D.E., Halsey, S.J., Schell, C.J., Leggett, Z., Yitbarek, S., and Harris, N.C. (2020). Human Dimensions: Raising black excellence by elevating Black ecologists through collaboration, celebration, and promotion. Bulletin of the Ecological Society of America. 101 (4): 1 – 6.
119. Joey Shaw, 2020. **Ledesma, D., *Powell, C., J. Shaw, and H. Chin. 2020. Enabling automated herbarium sheet image post-processing through neural network models for color reference chart detection. Applications in Plant Sciences. 8: e11331.
120. Joey Shaw, 2020. *Alley, C., *E. Rylander, *J. Dawson, *M. Feely, **D. Ledesma, *N. Parrish, *C. Powell, *J. Shelton, W. Barger, P. Davison, and J. Shaw. 2020. Saxifraga tridactylites (Saxifragaceae) naturalized in the Southeastern and Northwestern United States. Castanea 85: 1-13.
121. Hill Craddock, 2020. Crawford, H. and J.H. Craddock. (2020) Silviculture of the American chestnut in the Cumberland Uplands of Tennessee. Southeastern Partners in Plant Conservation 2020 Conference Abstracts. <https://atlantabg.org/conservation-research/outreach-education-and-training/southeastern-partners-in-plant-conservation/southeastern-partners-in->

plant-conservation-conference/southeastern-partners-in-plant-conservation-conference-2020-abstracts/

122. Hill Craddock, 2020. Deason, T, and J.H. Craddock (2020) Accelerated, graft-based conservation of under-sampled American chestnut populations in the South (Poster). TACF Annual Meeting. Gettysburg, PA. October 19, 2020. https://acf.org/wp-content/uploads/2019/11/393596_TACF_2019-Poster-Abstracts-Booklet.pdf
123. Thomas Wilson, 2020. Prah* J., Wilson, T. P., Giles, D., & Craddock, J. H. 2020. An overview of research regarding reservoirs, vectors and predators of the chytrid fungus *Batrachochytrium dendrobatidis*. *Acta Herpetologica*, 15(1), 39-45. https://doi.org/10.13128/a_h-8744
124. Sean Richards, 2020. Troisi, Jacopo, Pierpaolo Cavallo, Angelo Colucci, Luca Pierri, Giovanni Scala, Steven Symes, Carter Jones, and Sean Richards. *Metabolomics in genetic testing. Advances in Clinical Chemistry* 94 (2020): 85-153.
125. Sean Richards, 2020. Plunk EC*, Richards SM. Endocrine-Disrupting Air Pollutants and Their Effects on the Hypothalamus-Pituitary-Gonadal Axis. *International Journal of Molecular Sciences*. 2020; 21(23):9191. <https://doi.org/10.3390/ijms21239191>
126. Sean Richards, 2020. Thomas R. Rainwater, Jane Griess, Thomas M. Murphy, Shane M. Boylan, Benjamin B. Parrott, Satomi Kohno, Katherine A.E. Rainwater, Sean M. Richards, Matthew Guillette, Tony Mills, Steven G. Platt, Philip M. Wilkinson, and Louis J. Guillette Jr. "Leucistic American Alligator Hatchlings in Coastal South Carolina," *Southeastern Naturalist* 19(4), N62-N72, (4 November 2020). <https://doi.org/10.1656/058.019.0405>
127. Sean Richards, 2020. Jacopo Troisi, Antonio Raffone, Antonio Travaglino, Gaetano Belli, Carmen Belli, PhD, Santosh Anand, Luigi Giugliano, Pierpaolo Cavallo, Giovanni Scala, Steven Symes, Sean Richards, David Adair, Alessio Fasano, Vincenzo Bottigliero, Maurizio Guida. Development and Validation of a Serum Metabolomic Signature for Endometrial Cancer Screening in Postmenopausal Women. *JAMA Netw Open*. 2020;3(9):e2018327. doi:10.1001/jamanetworkopen.2020.18327
128. Stylianos Chatzimanolis, 2020. Chatzimanolis, S. 2020. Book review of: Klimaszewski, J., R. P. Webster, D. W. Langor, A. Brunke, A. Davies, C. Bourdon, M. Labrecque, A. F. Newton, J.-A. Dorval and J. H. Frank. 2018. *Aleocharinae Rove Beetles of Eastern Canada (Coleoptera, Staphylinidae, Aleocharinae): A Glimpse of Megadiversity*. *The Coleopterists Bulletin* 74(1): 60–61.
129. Francesca Leasi, 2020. Seigny JL, Norenburg JL, Leasi F (2020) A Bioinformatics Tutorial for Comparative Development Genomics in Diverse Meiofauna. In: *Developmental Biology of the Sea Urchin and Other Marine Invertebrates*. Springer Nature, Cham, Switzerland. ISBN: 978-1-0716-0973-6.
130. Bradley Reynolds, 2020. Ford, D.M., & Reynolds, B.R. (2020). *A Laboratory Manual for Introduction to Environmental Science*. Dubuque, Iowa: Kendall Hunt Publishing. Second Edition.
131. David Aborn, 2021. Aborn, D. A. Summary of window casualties on the University of Tennessee-Chattanooga campus. *The Migrant* 92:1-12.
132. Fernando Alda, 2021. Alda F, Ludt WB, Elías DJ, McMahan CD, Chakrabarty P. 2021. Comparing ultraconserved elements and exons for the Comparing ultraconserved elements and exons for phylogenomic analyses of Middle American cichlids: when data agree to disagree. *Genome Biology and Evolution* 13: evab161.
133. Fernando Alda, 2021. García J, Morán-Ordóñez A, García JT, Calero-Riestra M, Alda F, Sanz M, Suárez-Seoane S. 2021. Current landscape attributes and landscape stability in breeding grounds explain genetic differentiation in a long-distance migratory bird. *Animal Conservation* 24: 120-134

134. Stylianos Chatzimanolis, 2021. Chatzimanolis, S. and A. J. Brunke. 2021. A new apterous rove beetle genus (Coleoptera: Staphylinidae) from the Northern Andes with an assessment of its phylogenetic position. *European Journal of Taxonomy* 744: 67–82.
135. Stylianos Chatzimanolis, 2021. Engel, M. S., L. M. P. Ceriaco, G. D. Daniel et al. (94 coauthors including S. Chatzimanolis). 2021. The taxonomic impediment: a shortage of taxonomists, not the lack of technical approaches. *Zoological Journal of the Linnean Society* 193(2): 381-387.
136. Stylianos Chatzimanolis, 2021. Chatzimanolis, S. 2021. Out of Xanthopygus (Coleoptera: Staphylinidae): escape from polyphyly. *Zookeys* 1071: 83-107.
137. Timothy Gaudin, 2021. Boscaini, A., N. Toledo, B. Mamani-Quispe, R. Andrade Flores, M. Fernández-Monescillo, L. Marivaux, P.-O. Antoine, P. Münch, T. J. Gaudin and F. Pujos. 2021. Postcranial anatomy of the extinct terrestrial sloth *Simomylodon uccasamamensis* (Xenarthra: Mylodontidae) from the Pliocene of the Bolivian Altiplano and its evolutionary implications. *Papers in Palaeontology* 7(3):1557–1583 doi: 10.1002/spp2.1353
138. Timothy Gaudin, 2021. Gaudin, T.J., K.M. Smith* and J.R. Wible. 2021. Osteological anomalies in the extant two-toed sloth *Choloepus*, and the cranial anatomy of extinct and extant sloths. *Journal of Mammalian Evolution*. 28(4):1181-1192. doi:10.1007/s10914-021-09562-9. *UTC undergrad
139. Timothy Gaudin, 2021. Terhune, C.E., T.J. Gaudin, S. Curran and A. Petculescu. 2021. The youngest pangolin (Mammalia, Pholidota) from Europe: Pangolin remains from the early Pleistocene locality of Grăunceanu, Romania. *Journal of Vertebrate Paleontology* e1990075 (10 pages). DOI:10.1080/02724634.2021.1990075
140. Timothy Gaudin, 2021. Gaudin, T.J. and J. Broome*. 2021. Isolated petrosal of the extinct sloth *Glossotherium tropicorum* (Xenarthra, Folivora, Mylodontidae) from the island of Trinidad. *Bulletin of the Florida Museum of Natural History* 58(3):51-64. *UTC undergrad
141. Timothy Gaudin, 2021. Gaudin, T.J. 2021. Xenarthra and Pholidota (Armadillos, Anteaters, Sloths and Pangolins). In: *Encyclopedia of Life Sciences (ELS)*. John Wiley & Sons, Ltd: Chichester. DOI: 10.1002/9780470015902.a0029246
142. Timothy Gaudin, 2021. Edited volume: Rougier, G.W., T. J. Gaudin, and D. A. Croft. 2021. Head of the class: papers on cranial anatomy & evolution in mammals and their kin in honor of John R. Wible. *Journal of Mammalian Evolution*.
143. Timothy Gaudin, 2021. Rougier, G.W., T.J. Gaudin, and D.A. Croft. 2021. Head of the class: John R. Wible's transformative insights into mammalian craniodental anatomy. *Journal of Mammalian Evolution*. 5 pp. doi:10.1007/s10914-021-09587-0
144. Timothy Gaudin, 2021. Abstract: Curran, S.C., Terhune, C.E., Croitor, R., Dragusin, V., Fox, D.L., Garrett, N., Gaudin, T., Ironside, L.B., Petculescu, A., Pobiner, B., Robinson, C., Robu, M., Tantau, I., Ungar, P. and Werdelin, L. 2021. Paleoecology and biochronology of early Pleistocene sites in southern Romania. *American Association of Physical Anthropologists Annual Meeting (virtual)*, April 7-8, 2021.
145. Timothy Gaudin, 2021. Abstract: Boscaini, A., M. Fernández-Monescillo, M.E. Pérez, B. Mamani Quispe, R. Andrade Flores, T.J. Gaudin, L. Marivaux, P.-O. Antoine, P. Münch., and Y. F. Pujos. 2021. El yacimiento de Ayo Ayo-Viscachani (Plioceno-Pleistoceno, Departamento de La Paz, Bolivia): 50 años desde su descubrimiento. *Reunión de Comunicaciones de la Asociación Paleontológica Argentina*
146. Timothy Gaudin, 2021. Abstract: Pujos, F., T. J. Gaudin, A. Boscaini, M. Alejandra Abello, R.A. Flores, M. Fernández-Monescillo, B. Mamani Quispe, L. Marivaux, M. B. Prámparo, P.-O. Antoine, y P. Münch. 2021. The megatherioid sloth “*Xyophorus*” villarroeli from the late Miocene of Achiri (Bolivia). *Reunión de Comunicaciones de la Asociación Paleontológica Argentina*.
147. Timothy Gaudin, 2021. Abstract: Pujos, F., L. R. González Ruiz, T. J. Gaudin, A. Boscaini, M. Alejandra Abello, R. A. Flores, M. Fernández-Monescillo, B. Mamani Quispe, L.

- Marivaux, M. B. Prámparo, P.-O. Antoine, y P. Münch. 2021. New data on the glyptodontid *Trachycalyptoides* from the late Miocene Bolivian locality of Achiri. Reunión de Comunicaciones de la Asociación Paleontológica Argentina.
148. Timothy Gaudin, 2021. Abstract: Boscaini, A., D.A. Iurino, R. Sardella, R.D.E. MacPhee, T.J. Gaudin, I.M. Soto, and F. Pujos. 2021. Endocranial structures of a juvenile *Glossotherium robustum* (Xenarthra, Mylodontidae) and preliminary considerations on their ontogeny. Congreso de la Asociación Paleontológica Argentina.
 149. David Giles, 2021. Smith D. S., C. Houck, A. Lee, T. B. Simmons, O. N. Chester, A. Esdaile, S. J. K. Symes and D. K. Giles. 2021. Polyunsaturated fatty acids cause physiological and behavioral changes in *Vibrio alginolyticus* and *Vibrio fischeri*. *Microbiologyopen* 10:e1237. doi: 10.1002/mbo3.1237.
 150. David Giles, 2021. Abstract: Rooney M., Y. Xiong, S. Paredes, J. Hill, M. Horewitz, D. Giles, E. Mihailescu and M. Cotten. 2021. How the Structure and Membrane Activity of the Host Defense Peptide Piscidin are Impacted by Metallation, Oxidized Lipids, and Polyunsaturated Fatty Acids. *The FASEB Journal*, 35.
 151. Loren Hayes, 2021. Olivier, C., Jaeggi, A.V., Hayes, L.D., & Schradin, C. 2022. Revisiting the components of *Macroscelidea* social systems: Evidence for variable social organization, including pair-living, but not for a monogamous mating system. *Ethology* 128: 383-394.
 152. Loren Hayes, 2021. Correa, L.A., Leon, C., Ramirez-Estrada, J., Ly-Prieto, A., Abades, S., Hayes, L.D., Soto-Gamboa, M., & Ebensperger, L.A. 2021. One for all and all for one: phenotype assortment and direct fitness in masculinized females. *Behavioral Ecology*. 32(6), 1266-1275.
 153. Loren Hayes, 2021. Hayes, L.D., Aviles, L., Fernandez-Duque, E., Huck, M., Lacey, E.A., Maldonado-Chaparro, A., Matchinske, M.*, Pillay, N., Solomon, N.G. & Schradin, C. 2021. Using remote seminars to teach animal behavior. *Ethology*. 127: 935-942.
 154. Loren Hayes, 2021. Ebensperger, L. A., Gómez, C., Aspillaga-Cid, A., León, C., Ramírez-Estrada, J., Correa, L. A., ... & Hayes, L. D. (2021). Socially unstable conditions experienced during development prime female *Octodon degus* to shape the phenotype of their own offspring. *Hormones and Behavior*, 134, 105011.
 155. Loren Hayes, 2021. Ebensperger, L. A., Abades, S., Riquelme, J., Correa, L. A., & Hayes, L. D. (2021). Socioecological conditions predict degu social instability and provide limited cues to forecast subsequent breeding conditions. *Behavioral Ecology and Sociobiology*, 75(5), 1-15.
 156. Loren Hayes, 2021. Ebensperger, L.A., Quirici, V., Bunster, V., Leon, C., Ramirez, J., & Hayes, L.D. 2021. Effects of radio-collars are not contingent on socioecological conditions in a social rodent. *Journal of Wildlife Management*.
 157. Azad Hossain, 2021. Hossain, A. Mathias, C. and Blanton, R., 2021, Remote Sensing of Turbidity in the Tennessee River Using Landsat 8 Satellite, *Remote Sensing*, 2021, 13, 3785. <https://doi.org/10.3390/rs13183785>.
 158. Azad Hossain, 2021. Chao, X., Jia, Y., Hossain, A., and Zhang, Y., 2021, Numerical Simulation of Sediment Transport, Phytoplankton Biomass and Salinity Recovery Processes in Lake Pontchartrain due to Bonnet Carré Spillway Flood Release, *Ecological Engineering*, 160, 2021, 106151, <https://doi.org/10.1016/j.ecoleng.2021.106151>.
 159. Azad Hossain, 2021. Dey,P., Roy, S., Bathi, J., Mishra, A., Leasi, F., and Hossain, A., 2021, Parameter Sensitivity Analysis of the HSPF Model on a Pervious Landcover Dominated Watershed, *Proceedings of EWRI Congress 2021*, 561-574, <https://ascelibrary.org/doi/abs/10.1061/9780784483466.051>.
 160. Hope Klug, 2021. Klug, H. & Stone, L.*. 2021. More than just noise: Chance, mating success, and sexual selection. *Ecology & Evolution*. 00:1–15. <https://doi.org/10.1002/ece3.7484>

161. Hope Klug, 2021. Wiegand, T.P.*, Gentry, G.*, McCoy, Z.□, Tanis, C., Klug, H., Bonsall, M.B., Boyd, J.N. 2020. Visualizing connectivity of ecological and evolutionary concepts –an exploration of research on plant species rarity. *Ecology & Evolution*. 10 (17): 9037-3047.
162. Francesca Leasi, 2021. Dey P, Roy S, Bathi JL, Mishra A, Leasi F, Hossain A (2021) Parameter Sensitivity Analysis of the HSPF Model on a Pervious Landcover Dominated Watershed. Peer-reviewed Conference Paper in World Environmental and Water Resources Congress 2021: Planning a Resilient Future along America's Freshwaters.
163. Francesca Leasi, 2021. Sevigny JL, Leasi F, Simpson S, Di Domenico M, Jorger KM, Norenburg JL, Thomas WK (2021) Target Enrichment of Metazoan Mitochondrial DNA with Hybridization Capture Probes. *Ecological Indicators*, 121: 106973.
164. Francesca Leasi, 2021. Leasi F, Sevigny JL, Hassett BT (2021) Meiofauna as a valuable bioindicator of climate change in the polar regions. *Ecological Indicators*, 121, 107133
165. Ashley Manning-Berg, 2021. Nabhan, S., Mishra, B., Kah, L.C., Manning-Berg, A.R., van Zuilen, M.A., 2021. Structural and chemical heterogeneity of Proterozoic organic microfossils of the ca. 1 Ga old Angmaat Formation, Baffin Island, Canada. *Geobiology*. <https://doi.org/10.1111/gbi.12463>
166. Jonathan Mies, 2021. Hossain, A., Stuart, W., Mies, J., and Brock-Hon, A., 2021, Investigating Urban Heat Island (UHI) Impact for the City of Chattanooga, Tennessee Using GIS and Remote Sensing in Lackner, M., Sajjadi, B., and Chen, W-Y., eds., *Handbook of Climate Change Mitigation and Adaptation*, 3rd Edition, Springer.
167. Jonathan Mies, 2021. Mies, J. W. and White, Jessica (student), 2021, The arcuate geometry of Onslow Bay, North Carolina, its influence on hurricane-induced microseisms, and potential relations to coastal processes, *Geological Society of America Abstracts with Programs*, v. 53, n. 6, doi: 10.1130/abs/2021AM-365017.
168. Bradley Reynolds, 2021. Davis, E. A., Wilson, T.P., & Reynolds, B. R. (2021). Self-Interest, Compassion, and Consistency in an Environmental Ethics Class: Would Students Give Up Their Retirement to Stop the Coronavirus? *International Journal of Ethics Education*. DOI 10.1007/s40889-021-00126-2
169. Bradley Reynolds, 2021. Wilson, T. P., Reynolds, B.R., Nyok P., Chauhun, R., Wilson, P. J., Wilson, T. M., and Team Salamander. (2021). Turtles All the Way Down: An Update on the Asian Turtle Crisis with New Directions. *Education about Asia*.
170. Henry Spratt, 2021. Keilman, R., S. Harding, M. Rowin, E. Reade., P. Klingborg. D. Levine, and H. Spratt, Jr. 2021. Investigations of Staphylococcal contamination on environmental surfaces of a neonatal intensive care unit of a children's hospital. *American Journal of Infection Control*, 49:1450-1453. doi: 10.1016/j.ajic.2021.05.007.
171. Joey Shaw, 2021. *Powell, C. and J. Shaw. 2021. Performant barcode decoding for herbarium specimen images using vector assisted region proposals (VARP). *Applications in Plant Science* (9) e11436.
172. Joey Shaw, 2021. *Powell, C., **A. Krakowiak, *R. Fuller, **E. Rylander, E. Gillespie, S. Krosnick, B. Ruhfel, A. Morris, and J. Shaw. 2021. Estimating herbarium specimen digitization rates: accounting for human experience. *Applications in Plant Science*. (9) e11415
173. Hill Craddock, 2021. Perkins, M.T., Zhebentyayeva, T., Sisco, P.H., and Craddock, J.H. (2021). Genome-wide sequence-based genotyping supports a nonhybrid origin of *Castanea alabamensis*. *Systematic Botany* 46(4): 973-984. DOI: <https://doi.org/10.1600/036364421X16370109698524>
174. Thomas Wilson, 2021. Davis, E. A., Wilson, T.P., & Reynolds, B. R. (2021). Self-Interest, Compassion, and Consistency in an Environmental Ethics Class: Would Students Give Up Their Retirement to Stop the Coronavirus? *International Journal of Ethics Education*. DOI 10.1007/s40889-021-00126-2

175. Thomas Wilson, 2021. Wilson, T. P., Reynolds, B.R., Nyok P., Chauhun, R., Wilson, P. J., Wilson, T. M., and Team Salamander. (2021). Turtles All the Way Down: An Update on the Asian Turtle Crisis with New Directions. Education about Asia.
176. Thomas Wilson, 2021. Davis*, E. A., Wilson, T. P., & B.R. Reynolds. 2021. Self-interest, compassion, and consistency in an environmental ethics class: would students give up their retirement to stop the coronavirus? International Journal of Ethics Education. July, 12th (1–11). Advance online publication. <https://doi.org/10.1007/s40889-021-00126-2>
177. Thomas Wilson, 2021. Edmonds* D., Dreslik M.J., Lovich J.E., Wilson T.P., Ernst C.H. 2021. Growing as slow as a turtle: Unexpected maturational differences in a small, long-lived species. PLoS One. 2021 Nov 18;16(11): e0259978. doi: 10.1371/journal.pone.0259978. PMID: 34793528; PMCID: PMC8601529.
178. Thomas Wilson, 2021. Wilson, T. P., Reynolds, B.R., Nyok P., Chauhun, R., Wilson, P. J., Wilson*, T. M., and Team Salamander*. 2021. Turtles All the Way Down: An Update on the Asian Turtle Crisis with New Directions. Education about Asia. Education About Asia 26(1):28-33.
179. Sean Richards, 2021. *Chambers, Weston S., Jaida G. Hopkins*, and Sean M. Richards. 2021. A Review of Per-and Polyfluorinated Alkyl Substance (PFAS) Impairment of Reproduction. Frontiers in Toxicology: Vol 3. <https://doi.org/10.3389/ftox.2021.732436>
180. Sean Richards, 2021. Ledesma D*, Symes S, Richards S. Advancements within modern machine learning methodology: Impacts and prospects for biomarker discovery. Current Medicinal Chemistry. 2021 Feb. DOI: 10.2174/0929867328666210208111821.
181. Sean Richards, 2021. Troisi, Jacopo, Pierpaolo Cavallo, Sean Richards, Steven Symes, Angelo Colucci, Laura Sarno, Annamaria Landolfi et al. "Noninvasive screening for congenital heart defects using a serum metabolomics approach." Prenatal Diagnosis 41, no. 6 (2021): 743-753.
182. Sean Richards, 2021. Troisi, Jacopo, Angelo Colucci, Pierpaolo Cavallo, Sean Richards, Steven Symes, Annamaria Landolfi, Giovanni Scala et al. "A Serum Metabolomic Signature for the Detection and Grading of Bladder Cancer." Applied Sciences 11, no. 6 (2021): 2835.
183. Callie Adams, 2021. Adams, C., Bell, R., Boyd, J., Collins, L., Klug, H., Murphy, C., Nelson, C. 2021. Investigations in Biology Laboratory Manual - BIOL 1120. Plymouth, MI: Hayden-McNeil. Fifth Edition.
184. Amy Brock-Hon, 2021. Hossain, A.K.M.A., Stewart, W., Mies, J., Brock-Hon, A., 2021. Investigating urban heat island impact for the city of Chattanooga, Tennessee, Using GIS and Remote Sensing. Handbook of Climate Change Mitigation and Adaptation, M. Lackner et al., (eds). https://doi.org/10.1007/978-1-4614-6431-0_136-1#DOI
185. Azad Hossain, 2021. Hossain, A., Stuart, W., Mies, J., and Brock-Hon, A., 2021, Investigating Urban Heat Island (UHI) Impact for the City of Chattanooga, Tennessee Using GIS and Remote Sensing, in "Handbook of Climate Change Mitigation and Adaptation", Maximilian Lackner MBA. (editor), Springer International Publishing. https://doi.org/10.1007/978-1-4614-6431-0_136-1.
186. Richards Sean, 2021. *Hopkins, Jaida, Sweck, Samantha*, Richards, Sean. "The Diagnosis, Clinical Course, Treatment, and Prevention of the Rabies Virus" In Rabies Virus at the Beginning of 21st Century, edited by Sergey Tkachev. London: IntechOpen, 2021. 10.5772/intechopen.97691. Available from: <https://www.intechopen.com/online-first/76642>
187. David Aborn, 2022. Taff, C. C. C. Zimmer, T. A. Ryan, D., C. van Oordt, D. A. Aborn, D. R. Ardia, L., S. Johnson, A. P. Rose, and M. N. Vitousek. Individual variation in natural or manipulated corticosterone does not covary with circulating glucose in a wild bird. Journal of Experimental Biology <https://doi.org/10.1242/jeb.243262>
188. Fernando Alda, 2022. Snead A, Alda F. 2022. Time-series sequences for evolutionary inferences. Integrative and Comparative Biology: icac146

189. Fernando Alda, 2022. Hart PB, Arnold RJ, Alda F, Pietsch TW, Kenaley CP, Hutchinson D, Chakrabarty P. 2022. The evolutionary relationships of anglerfishes (Lophiiformes) reconstructed using ultraconserved elements. *Molecular Phylogenetics and Evolution* 171: 107459
190. Jennifer Boyd, 2022. Boyd J.N., Odell J., Rogers W., Cruse-Sanders J., Anderson J.T., Baskauf C., Brzyski J. 2022. Phenotypic plasticity and genetic diversity elucidate rarity and vulnerability of an endangered riparian plant. *Ecosphere* e996. DOI: 10.1002/ecs2.3996
191. Jennifer Boyd, 2022. Boyd J.N., Anderson J.T., Brzyski J., Baskauf C., Cruse-Sanders J. 2022. Ecological causes and consequences of rarity: a meta-analysis. *New Phytologist* 235: 1272-1286. DOI: 10.1111/nph.18172
192. Stylianos Chatzimanolis, 2022. Chatzimanolis, S. 2022. A revision of the genus *Xanthopygus* Kraatz (Staphylinidae: Xanthopygina). *Zootaxa* 5099(2): 151–178.
193. Stephanie DeVries, 2022. DeVries, S., Bradbury, K., and Cardiff, M. (2022). “A Groundwater Flow Model for Waupaca, WI.” Wisconsin Geological Survey and Natural History Survey Technical Report. 007, 88 p., <https://doi.org/10.54915/xdis1726>.
194. Stephanie DeVries, 2022. †Pineda, Y.S., DeVries, S.L., Steiner, N.S., and Block-Cora, K. A. Bioleaching of refractory gold in mine tailings by *Alcaligenes faecalis*. Submitted to *Minerals* on 11/8/2022. In Review
195. Stephanie DeVries, 2022. Brown, M.G., McDonald, K.C., Zimmermann, R., Steiner, N., DeVries, S., Bourgeau-Chavez, Laura. (2022). “Characterization of Site-Specific Vegetation Activity in Alaskan Wet and Dry Tundra as Related to Climate and Soil State.” *Ecosphere* 13(2): e3939.
196. Stephanie DeVries, 2022. DeVries, S.L., *Hooten, W.G., Block-Cora, K.A., *White, M.D., and *Mollica, M.J. Nitrate Calculator GUI 1.2.1: A software modelling tool for estimating well water nitrate in shallow sand and gravel aquifers. Submitted to *Journal of Environmental Modeling and Software* on 12/30/2022. In Review.
197. Timothy Gaudin, 2022. Casali, D.M., A. Boscaini, T.J. Gaudin, and F.A. Perini. 2022. Reassessing the phylogeny and divergence times of sloths (Mammalia: Pilosa: Folivora), exploring alternative morphological partitioning and dating models. *Zoological Journal of the Linnean Society* 196:1505–1551.
198. Timothy Gaudin, 2022. Gaudin, T.J., A. Boscaini, B. Mamani Quispe, R. Andrade Flores, M. Fernández-Monescillo, L. Marivaux, P.-O. Antoine, P. Münch, and F. Pujos. 2022. Recognition of a new nothrotheriid genus (Mammalia, Folivora) from the early late Miocene of Achiri (Bolivia) and the taxonomic status of the genus *Xyophorus*. *Historical Biology* 35(6):1041-1051. DOI:10.1080/08912963.2022.2075744
199. Timothy Gaudin, 2022. Gaudin, T.J. and T. Scaife*. 2022. Cranial osteology of a juvenile specimen of *Acratocnus* ye (Mammalia, Xenarthra, Folivora) and its ontogenetic and phylogenetic implications. *The Anatomical Record*, 1-31. doi:10.1002/ar.25062. *UTC undergrad
200. Timothy Gaudin, 2022. Abstract: Turner, C.M.***, T.P. Wilson, W.J. Loughry, and T.J. Gaudin. 2022. Distributional and disease surveys of nine-banded armadillo in Tennessee using roadkill and community science data. Abstracts of 32nd Colloquium on the Conservation of Mammals in the Eastern United States, Virtual meeting. **UTC grad student
201. Timothy Gaudin, 2022. Abstract: Turner, C.M.***, T.P. Wilson, W.J. Loughry, and T.J. Gaudin. 2022. Distributional and disease surveys of nine-banded armadillo in Tennessee using roadkill and community science data. Tennessee chapter, The Wildlife Society, Virtual meeting. **UTC grad student
202. Timothy Gaudin, 2022. Abstract: Turner, C.M.***, T.P. Wilson, W.J. Loughry, and T.J. Gaudin. 2022. Distributional and disease surveys of nine-banded armadillo in Tennessee using roadkill and community science data. American Society of Mammalogists, Annual meeting. **UTC grad student

203. Timothy Gaudin, 2022. Abstract: Gaudin, T.J. and T. Scaife*. 2022. Cranial osteology of a juvenile specimen of *Acratocnus* ye (Mammalia, Xenarthra, Folivora) and its ontogenetic and phylogenetic implications. Society of Vertebrate Paleontology, Annual Meeting. *UTC undergrad
204. Timothy Gaudin, 2022. Abstract: Gaudin, T.J. and C. Turner**. 2022. The spread of nine-banded armadillos (*Dasypus novemcinctus*) in Tennessee: Determining habitat preferences of and assessing prevalence of Hansen's disease in Tennessee with assistance from community science data. 2022 Innovations in Invasive Species Management Conference. **UTC grad student
205. David Giles, 2022. Turgeson A., L. Morley, D. Giles and B. Harris. 2022. Simulated docking predicts putative channels for the transport of long-chain fatty acids in *Vibrio cholerae*. *Biomolecules* 12(9):1269. doi: 10.3390/biom12091269
206. Loren Hayes, 2022. Blumstein, D., Hayes, L.D., Pinter-Wollman, N. Social consequences of rapid climate change. *Trends in Ecology and Evolution*:<https://doi.org/10.1016/j.tree.2022.11.005>.
207. Azad Hossain, 2022. Chao, X., A. Hossain, A., Al-Hamdan, M. Z., Jia, Y., and Cizdziel, J. V., 2022, Three-Dimensional Numerical Modeling of Flow Hydrodynamics and Cohesive Sediment Transport in Enid Lake, Mississippi, *Geosciences* 12, no. 4: 160. <https://doi.org/10.3390/geosciences12040160>.
208. Azad Hossain, 2022. Jones, S. M. and Hossain, A., 2022, Application of Remote Sensing to Study the Potential Impacts of 2020 Wildfire Events on the Glaciers of Mount Baker, Washington, The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XLVI-M-2-2022, pp 131-134, ASPRS 2022 Annual Conference, 6–8 February & 21–25 March 2022, Denver, Colorado, USA & virtual.
209. Azad Hossain, 2022. Campbell, S. and Hossain, A., 2022, Studying the Potential Impact of Groundwater Depletion on Surface Vegetation in the Mississippi Delta Using Remote Sensing, The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XLVI-M-2-2022, pp 53-57, Proceeding of ASPRS 2022 Annual Conference, 6–8 February & 21–25 March 2022, Denver, Colorado, USA & virtual.
210. Hope Klug, 2022. Klug, H., Langley, C.*, & Reyes, E. □ 2022. Resource acquisition and pre-copulatory sexual selection. *Ecology and Evolution* 12: e9137.
211. Hope Klug, 2022. Udu, I.N.*, Bonsall, M.B.B., & Klug, H. 2022. Life history and the evolutionary loss of parental care. *Proceedings of the Royal Society B* 289: 20220658.
212. Hope Klug, 2022. Klug, H., Langley, C.*, & Reyes, E. □ 2022. Cascading effects of pre-adult survival on sexual selection. *Royal Society Open Science* 9: 211973.
213. Hope Klug, 2022. Azad, T.**, Alonzo, S.H., Bonsall, M.B.B., & Klug, H. 2022. Life history, mating dynamics, and the origin of parental care. *Journal of Evolutionary Biology* 35: 379– 390.
214. Francesca Leasi, 2022. Cesaretti A, Leasi F, Todaro MA (2022). Confocal Laser Scanning Microscopy helps understand the functioning of the reproductive apparatus in stylet-bearing Urodasy (Gastrotricha: Macrotrichida). *Water* 15 (6), 1106.
215. Francesca Leasi, 2022. Leasi F & Cline JL (2022) DNA metabarcoding reveals impacts of anthropogenic stressors on freshwater meiofauna. *Limnologia*, 96: 126005
216. Katherine Ludwig, 2022. Abstract: Ludwig, K., Bidgoli, T., Stockli, D.F., Gomez, F., and Polun, S., 2022, Constraints on the southern extent of the Southern Death Valley fault from detrital zircon U-Pb geochronology and bedrock (U-Th)/He thermochronology: *GSA Abstracts with Programs*, v. 54, no. 5.
217. Ashley Manning-Berg, 2022. Manning-Berg, A.R., Selly, T., Bartley, J.K. 2022. Decomposition patterns as a tool for understanding taphonomic history in microfossil assemblages. *Geobiology*. <https://doi.org/10.1111/gbi.12475>
218. Jonathan Mies, 2022. Bramblett, J., Gossett, L.(student), and Mies, J.W., 2022, Using portable document cameras and portable digital microscopes in both virtual and in-class

Historical Geology and Petrology labs, Geological Society of America Abstracts with Programs, v. 54, n. 4, doi: 10.1130/abs/2022NC-374974

219. Henry Spratt, 2022. Spratt, H. G., D. Levine, S. Weiss-Reed, A. Sinha. 2022. Infection prevention in a Neonatal Intensive Care Unit. *Infection Control Today*. 26,7. <https://www.infectioncontrolday.com/view/infection-prevention-is-key-in-a-neonatal-intensive-care-unit>.
220. John Tucker, 2022. Abstract: John C. Tucker, Preliminary Assessment of Environmental Review Pursuant to the Tennessee Inter-Basin Water Transfer Act. Tennessee Water Resources Symposium (April 20-21, 2022).
221. John Tucker, 2022. Abstract: N. Alston, C. Coles, C. Diaz, A. Earp, G. Greer, J. Hopson, L. Hurley, C. Melton, J. Skyles, A. Smith, A. V. Smith, T. Stewart, J. Tucker, Assessment of UTC Sustainability Initiatives. UTC Research Dialogues (April 12, 2022).
222. DeAnna Beasley, 2022. Beasley, D.E., Monsur, M., Hu, J., Dunn, R.R., and Madden, A.A. (2022). The bacterial community of childcare centers: Potential implications for microbial dispersal and child exposure. *Environmental Microbiome*. 17 (8): <https://doi.org/10.1186/s40793-022-00404-6>
223. Hill Craddock, 2022. Laport, R.G., Brookover, Z.S., Christman, B.D., Ng, J., Philley, K., and Craddock, J.H. (2022) Environmental Niche and Demographic Modeling of American Chestnut near its Southwestern Range Limit. *The American Midland Naturalist* 188(2), 137-176. <https://doi.org/10.1674/0003-0031-188.2.137>
224. Hill Craddock, 2022. Sandercock, A.M., Westbrook, J.W., Zhang, Q., Johnson, H.A., Saielli, T.M., Scrivani, J.A., Fitzsimmons, S.F., Collins, K., Perkins, M.T., Craddock, J.H., Schmutz, J, Grimwood, J., and Holliday, J.A. (2022). Frozen in time: rangewide genomic diversity, structure, and demographic history of relict American chestnut populations. *Molecular Ecology* 31 (18): 4640-4655 <https://doi.org/10.1111/mec.16629>
225. Sean Richards, 2022. Troisi, Jacopo, Antonio Mollo, Martina Lombardi, Giovanni Scala, Sean M. Richards, Steven JK Symes, Antonio Travaglino et al. "The Metabolomic Approach for the Screening of Endometrial Cancer: Validation from a Large Cohort of Women Scheduled for Gynecological Surgery." *Biomolecules* 12, no. 9 (2022): 1229.
226. Sean Richards, 2022. Troisi, Jacopo, Martina Lombardi, Giovanni Scala, Pierpaolo Cavallo, Rennae S. Tayler, Steven JK Symes, Sean M. Richards, Adair DC, Fasano A, McCowan LM, Guida M. "A screening test proposal for congenital defects based on maternal serum metabolomics profile." *American Journal of Obstetrics and Gynecology* (2022).
227. Sean Richards, 2022. Troisi, Jacopo, Maria Tafuro, Martina Lombardi, Giovanni Scala, Sean M. Richards, Steven JK Symes, Paolo Antonio Ascierto et al. "A Metabolomics-Based Screening Proposal for Colorectal Cancer." *Metabolites* 12, no. 2 (2022): 110.
228. Stylianos Chatzimanolis, 2022. Chatzimanolis, S. 2022. Book review of: Evans, A.V. 2021. *Beetles of Western North America*. *The Coleopterists Bulletin* 76(1): 54–55.
229. Stylianos Chatzimanolis, 2022. Chatzimanolis, S. 2022. Book review of: Klimaszewski, J., A. Brunke, D. S. Sikes, M. Pentinsaari, B. Godin, R. P. Webster, A. Davies, C. Bourdon, and A. F. Newton. 2021. *A Faunal Review of Aleocharinae Beetles in the Rapidly Changing Arctic and Subarctic Regions of North America (Coleoptera: Staphylinidae)*. *The Coleopterists Bulletin* 76(4): 606-607.
230. Azad Hossain, 2022. Hossain, A. and Greg Easson, 2022, Potential Impacts of the Growth of a Megacity in Southeast Asia, A Case Study on the City of Dhaka, Bangladesh, in "Handbook of Climate Change Mitigation and Adaptation", Wei-Yin Chen, John M. Seiner, Toshio Suzuki and Maximilian Lackner MBA. (editors), Springer International Publishing, pp 1-24, Online ISBN 978-1-4614-6431-0. Updated Editions (Original version published in 2015).
231. Azad Hossain, 2022. Cointegration of SARS-CoV-2 transmission with weather conditions and mobility during the first year of the COVID-19 pandemic in the United States, 2022, Hong Qin, Syed Tareq, William Torres, Megan Doman, Cleo Falvey, Jamaree Moore, Meng

Hsiu Tsai, Yingfeng Wang, Azad Hossain, Mengjun Xie, and Li Yang. Accepted in SPRINGER NATURE - Research Book Series: Transactions on Computational Science & Computational Intelligence.

232. Richards Sean, 2022. Elizabeth C. Plunk*, Weston S. Chambers*, and Sean M. Richards. 2022. Systems Biology In Metabolomics Perspectives, From Theory to Practical Application. Elsevier. Pages 3-25. 1st Edition - April 1, 2022
233. Richards Sean, 2022. Jacopo Troisi, Sean M. Richards, Giovanni Scala, and Annamaria Landolfi. 2022. Approaches in Untargeted Metabolomics. In Metabolomics Perspectives, From Theory to Practical Application. Elsevier. In Press. 1st Edition - April 1, 2022
234. Richards Sean, 2022. Jacopo Troisi, Sean M. Richards, Giovanni Troisi, and Giovanni Scala. 2022. Techniques for Converting Metabolomic Data for Analysis. In Metabolomics Perspectives, From Theory to Practical Application. Elsevier. In Press. 1st Edition - April 1, 2022
235. Richards Sean, 2022. Jacopo Troisi, Giovanni Troisi, Giovanni Scala, Sean M. Richards. 2022. Data analysis in metabolomics: From Information to Knowledge. In Metabolomics Perspectives, From Theory to Practical Application. Elsevier. In Press. 1st Edition - April 1, 2022
236. David Aborn, 2023. Young A. (student), Aborn D., Latta S., Boyd J.N, 2023. Avian winter habitat selection of avocado farms and intact forest in the Baboruco region of the Dominican Republic. Journal of Caribbean Ornithology, 36: 147-161
237. David Aborn, 2023. Feely, M. (student) and D. A. Aborn 2023. Changes in avian diversity and potential invasive seed dispersal post-wildfire in a southeastern deciduous forest; Flipper Bend woods, Signal Mountain, Tennessee. Southeastern Naturalist 22: 445-458
238. David Aborn, 2023. Marsh, L. K.,(student) and D. A. Aborn. 2023. Relationship Between Human Intrusion and Avian Body Condition During Fall Migration. Cities and the Environment Vol. 16: Iss. 2, Article 3. DOI: 10.15365/cate.2023.160203
239. Jennifer Boyd, 2023. Boyd J.N., Baskauf C., Lindsay A., Anderson J.T., Rogers W., Cruse-Sanders J., Brzyski J. Phenotypic plasticity and genetic diversity sheds light on endemism of rare Boechera perstellata and its potential vulnerability to climate warming. Ecology and Evolution 13: e10540.
240. Jennifer Boyd, 2023. Young A., Aborn D., Latta S., Boyd J.N, In Press. Avian winter habitat selection of avocado farms and intact forest in the Baboruco region of the Dominican Republic. Journal of Caribbean Ornithology.
241. Stylianos Chatzimanolis, 2023. Chatzimanolis, S. 2023. Asimos, a new genus of Xanthopygina from Central and South America. Koleopterologische Rundschau 92: 85–95.
242. Stylianos Chatzimanolis, 2023. Chatzimanolis, S. 2023. A revision of the genus Photinopygus Chatzimanolis (Staphylinidae: Xanthopygina). Zootaxa 5292(1): 1–100.
243. Jannatul Ferdoush, 2023. Barman P, Kaja A, Chakraborty P, Guha S, Roy A, Ferdoush J, Bhaumik SR. A novel ubiquitin–proteasome system regulation of Sgf73/ataxin-7 that maintains the integrity of the coactivator SAGA in orchestrating transcription, Genetics, Volume 224, Issue 3, July 2023, iyad071, <https://doi.org/10.1093/genetics/iyad071>
244. Timothy Gaudin, 2023. Boscaini, A., Iurino, D.A., Sardella, R., Timothy J. Gaudin, T.J. and Pujos, F. 2023. The endocranial cavities of sloths (Xenarthra, Folivora): insights from the brain endocast, bony labyrinth and cranial sinuses. Pp. 737-760 In: M.T. Dozo, A. Paulina-Carabajal, T. Macrini, and S. Walsh (eds.) Paleoneurology of Amniotes: New Directions in the Study of Fossil Endocasts. Springer Nature Switzerland, Cham, Switzerland.
245. Timothy Gaudin, 2023. Gaudin, T.J., Scaife, T.*, Toledo, N. and De Iuliis, G. 2023. Cranial osteology of the basal megatherioid sloth Schismotherium (Mammalia, Xenarthra, Folivora) and its taxonomic implications. Historical Biology. 19 pp. DOI: 10.1080/08912963.2022.2162399. *UTC undergrad
246. Timothy Gaudin, 2023. Casali, D.M., A. Boscaini, T.J. Gaudin, and F.A. Perini. 2023. Cranial and postcranial partitions show different patterns of morphological disparity and

evolutionary rates in Folivora (Mammalia: Pilosa). *Palaeontology*. e12639. doi: 10.1111/pala.12639.

247. Timothy Gaudin, 2023. Abstract: Boscaini, A., Casali, D.M., Toledo, N., Bargo, M.S., Cantalapiedra, J.L., Gaudin, T.J., Langer, M.C., Narducci, R., Pujos, F., Vizcaíno, S.F., Soto, E.M., Soto, I.M. 2023. De pequeños arborícolas a gigantes terrestres (y vice versa): la evolución del tamaño corporal en perezosos actuales y extintos. 5th RABE - Reunión Argentina de Biología Evolutiva - La Plata, October 2-6, 2023
248. Timothy Gaudin, 2023. Abstract: Gaudin, T.J., K. D. Rose, R. Rabenstein, and J. Habersetzer. 2023. New forelimb details of *Eurotamandua*, purported anteater from the middle Eocene of Messel, Germany, reveal extraordinary similarities to palaeonodons (*Pholidotamorpha*), not to *Xenarthra*. Society of Vertebrate Paleontology, Annual Meeting.
249. David Giles, 2023. Hofer R.N., A. Lin, B.J. House, C.N. Purvis, B.J. Harris, S.J.K. Symes and D.K. Giles. 2023. Exogenous polyunsaturated fatty acids (PUFAs) influence permeability, antimicrobial peptide resistance, biofilm formation, and membrane phospholipid structure in A-layer and non-A-layer strains of *Aeromonas salmonicida*. *J Fish Dis* 46(1):31-45. doi: 10.1111/jfd.13715.
250. David Giles, 2023. Saksena S., K. Forbes, N. Rajan and D. Giles. 2023. Phylogenetic investigation of Gammaproteobacteria proteins involved in exogenous long-chain fatty acid acquisition and assimilation. *Biochem Biophys Rep* 35: 101504.
251. Francesca Leasi, 2023. Cesaretti A, LEASI F, Todaro MA (2022). Confocal Laser Scanning Microscopy helps understand the functioning of the reproductive apparatus in stylet-bearing *Urodasys* (Gastrotricha:
252. Katherine Ludwig, 2023. Abstract: Ludwig, K., Bidgoli, T., Gomez, F., and Stockli, D., 2023, Implications of detrital zircon geochronology and bedrock thermochronology in the Avawatz Mountains for the extent and deformation history of the Southern Death Valley fault: *GSA Abstracts with Programs*, v. 55, no. 6.
253. Henry Spratt, 2023. Simmons, S. , H. G. Spratt, Jr., D. Levine, D. Berg, F. Dexter, D. Pitte, A. Peters, 2023. CoVid-19, 3 years later: What questions are still unanswered. *Infection Control Today*. 27, 2. https://www.infectioncontrolday.com/view/covid-19-3-years-later-what-questions-still-unanswered-?utm_source=sfmc&utm_medium=email&utm_campaign=03072023_ICT_KUR-23ICD0270_Kurin_eNL&eKey=aGVucnk3ByYXR0QHV0Yy5lZHU=.
254. Henry Spratt, 2023. Spratt, H. G., Jr., David Levine. 2023. CLABSI and CAUTI: What is an Infection Preventionist's Role? *Infection Control Today*, 27, 3. <https://www.infectioncontrolday.com/view/reducing-clabsi-cauti-what-is-an-infection-preventionist-s-role->.
255. Henry Spratt, 2023. Spratt, H. G., Jr., D. Levine. 2023. Special report on *Candida auris*: An emerging drug-resistant fungal threat. *Infection Control Today*. <https://www.infectioncontrolday.com/view/special-report-on-candida-auris-an-emerging-drug-resistant-fungal-threat>.
256. Henry Spratt, 2023. Spratt, H. G., Jr., David Levine. 2023. Mosquito-borne pathogens and Climate Change: The case of West Nile Virus. *Infection Control Today*. <https://www.infectioncontrolday.com/view/mosquito-borne-pathogens-climate-change-case-west-nile-virus>.
257. DeAnna Beasley, 2023. Lafferty, D., McKenney, E., Hubbard, T., Trujillo, S., Beasley, D.E. (2023) A path forward: creating an academic culture of justice, equity, diversity and inclusion. *Bulletin of the Ecological Society of America*. 00(00):e2117. <https://doi.org/10.1002/bes2.2117>
258. DeAnna Beasley, 2023. Brooks, H.B.(student), Guzman-Hernandez, I.(student), and Beasley, D.E. (2023). Ant diversity in a temperate urban environment. *BIOS*. 93(4): 117 – 123. <https://doi.org/10.1654/BIOS-D-20-00018>

259. Sean Richards, 2023. Troisi, Jacopo, Steven J. K. Symes, Martina Lombardi, Pierpaolo Cavallo, Angelo Colucci, Giovanni Scala, David C. Adair, Maurizio Guida, and Sean M. Richards. 2023. "Placental Metabolomics of Fetal Growth Restriction" *Metabolites* 13, no. 2: 235. <https://doi.org/10.3390/metabo13020235>
260. Callie Adams, 2023. Adams, C., Bell, R., Collins, L., Klug, H., Murphy, C., Shaw, J. 2023. *Investigations in Biology Laboratory Manual - BIOL 1110*. Plymouth, MI: Hayden-McNeil. Sixth Edition.
261. Hope Klug, 2012-2023. Bell, R., Collins, L., Klug, H., Montgomery, M., & Shaw, J. 2012-2023. *Investigations in Biology Laboratory Manual: Biology 1110*. Hayden-McNeil. (Authored Microevolution & Animal Behavior laboratory exercises).
262. Hope Klug, 2015-2023. Bell, R., Boyd, J., Collins, L., Klug, H., Montgomery, M. & Nelson, C. 2015-2021. *Investigations in Biology Laboratory Manual: Biology 1120*. Hayden-McNeil. (Authored Speciation laboratory exercise).
263. Katherine Kinnear, 2017-2023. Collins, L, Kinnear K., Bramblett, J. and Caskey, J. (2018). *Human Physiology Laboratory Manual*. Plymouth, MI: Hayden McNeil Publishing

Appendix 4-J Faculty Presentations 2018-2023

1. David Aborn, 2018. C. Ross (student) and D. A. Aborn. "The effects of urban extent on avian diversity: a citizen science and GIS study". Oral presentation. Joint Association of Field Ornithologists and Wilson Ornithological Society meeting, Chattanooga, TN
2. David Aborn, 2018. M. Feely (student) and D. A. Aborn. "Passerine occurrence and seed dispersal post-wildfire within the Flipper Bend Woods of Signal Mountain, Tennessee". Poster. Joint Association of Field Ornithologists and Wilson Ornithological Society meeting
3. David Aborn, 2018. H. Youngman (student), R. Huffines, and D. A. Aborn. "Post-fledging habitat use and movements of Worm-eating Warblers (*Helmitheros vermivorum*) in the Tennessee River Gorge". Poster. Joint Association of Field Ornithologists and Wilson Ornithological Society meeting
4. Jennifer Boyd, 2018. Wiegand T, Gentry B, McCoy Z, Odell J, Odell H, Bonsall M, Klug H, Boyd JN. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity. Poster. SoCon Undergraduate Research Forum (SURF). Wofford College, Spartanburg, SC. November 2018.
5. Jennifer Boyd, 2018. Wooten S, Boyd JN. Ex situ conservation of the rare white fringeless orchid. Poster. Student Conference on Conservation Science. American Museum of Natural History, New York, NY. October 2018. Wiegand T**, Gentry B**, McCoy Z*, Odell J*, Odell H**, Klug H, Boyd JN. Visualizing connectivity of ecological and evolutionary concepts with network analysis. Poster. Ecological Society of America. New Orleans, LA. August 2018.
6. Stylianos Chatzimanolis, 2018. Are these new genera? A morphological phylogenetic analysis of *Xanthopygina*. Joint Annual Meeting of Entomological Society of America and the Entomological Society of Canada, Vancouver, Canada.
7. Timothy Gaudin, 2018. New material of the extinct sloth *Simomyiodon uccasamamensis* (*Xenarthra*, *Mylodontidae*) from the Pliocene of the Bolivian Altiplano: systematic and paleobiological implications. [poster presentation] Society of Vertebrate Paleontology, 78th Annual Meeting, Albuquerque, NM, October 19, 2018.
8. David Giles, 2018. Expanding the roles of exogenous fatty acids in Gram-negative bacteria. Association of Southeastern Biologists Meeting. Oral Presentation. March 2018.
9. Azad Hossain, 2018. Richard B., and Hossain, A., 2018, Mapping the Recovery Process of Vegetation Growth in Copper Basin, Tennessee Using Remotely Sensing Technology, 3rd Annual UTC Research Dialogue, April 3-4, 2017. The University of Tennessee at Chattanooga.
10. Azad Hossain, 2018. Beitel, H.R., Churnet, H.G., Hossain, A., and Mies, J.W., 2018, Characterization of metamorphic zones in the Tennessee Blue Ridge using GIS and digital image processing, 2018 annual meeting of GSA Southeastern Section. 12–13 April, Knoxville, Tennessee.
11. Azad Hossain, 2018. Springer, H. H., and Hossain, A., 2018, Developing a model to map the potential areas for landslide hazards in Hamilton County, TN using GIS and remote sensing, 2018 annual meeting of GSA Southeastern Section. 12–13 April, Knoxville, Tennessee.
12. Azad Hossain, 2018. Adair, W.A., Beitel, H.R., Hamid, Z. A., Hossain, A., and Mies, J.W., 2018, Exploring the potential of remote sensing and GIS for geological mapping of Woodall Shoals, GA-SC, 2018 annual meeting of GSA Southeastern Section. 12–13 April, Knoxville, Tennessee.
13. Hope Klug, 2018. Klug, H. & Stone, L.*. The role of chance in determining mating success (Poster Presentation), Evolution 2018; Montpellier, August 2018
14. Francesca Leasi, 2018. University of Tennessee at Chattanooga. BGE Department Series. Talk title "Meiofauna matter! What small invertebrates tell us about changing environments?"
15. DeAnna Beasley, 2018. Beasley, D.E., Penick, C.A., and Hightower, H.J.* (2018). Cicadas in our backyard. Never Home Alone symposium: Biologists share stories, foods, drinks, and insights from the study of the life in homes and backyards, Raleigh, NC.

16. DeAnna Beasley, 2018. Beasley, D.E., Penick, C.A., Sylvia IV, J.J., and Shell, L.K. (2018). Roundtable: Developing Partnerships for Interdisciplinary Design-Based Learning. Conference of the International Society for Exploring Teaching and Learning, Tempe, AZ.
17. DeAnna Beasley, 2018. Beasley, D.E. (2018). Urbanization disrupts latitude-size rule in periodical cicadas. Ecological Society of America national conference, New Orleans, LA.
18. DeAnna Beasley, 2018. Invited talk: Beasley, D.E., Hartzler, M., and Meador, J. (2018). Citizen Science: Help Your Community Discover the Natural World. 2018 Southeast Conference for Land and Community Conservation, Chattanooga, TN.
19. DeAnna Beasley, 2018. Brooks, H*, Guzman Hernandez, I*, and Beasley, D.E. (2018). Changes in ant biodiversity across an urban gradient. Association of Southeastern Biologists regional conference, Myrtle Beach, SC.
20. DeAnna Beasley, 2018. Guzman Hernandez, I*, Brooks, H*. and Beasley, D.E. (2018). Ant diet preference in urban habitats. Association of Southeastern Biologists regional conference, Myrtle Beach, SC.
21. DeAnna Beasley, 2018. Ross, C, Menninger, H.L., Hartstone-Rose, A. and Beasley, D.E. (2018). Annual cicada species response to a total solar eclipse. Association of Southeastern Biologists regional conference, Myrtle Beach, SC.
22. DeAnna Beasley, 2018. Beasley, D.E. (2018). Urbanization disrupts latitude size rule in periodical cicadas. Association of Southeastern Biologists regional conference, Myrtle Beach, SC.
23. Joey Shaw, 2018. invited talk: Friends of Roan Mountain 56th Annual Roan Mountain Fall Naturalists Rally. 2018. Digitizing Tennessee's one million herbarium specimens.
24. Joey Shaw, 2018. **Krakowiak, A. and J. Shaw. 2018. Orchard Knob: The forgotten glades of Chattanooga and an update on *Clematis fremontii*. Tennessee Academy of Sciences meeting in Clarksville, TN.
25. Joey Shaw, 2018. *Shelton, J. and J. Shaw. 2018. Applications, methods, and examples of research projects using the burgeoning Southeastern Regional Network of Expertise and Collections database. Tennessee Academy of Sciences meeting in Clarksville, TN.
26. Joey Shaw, 2018. *Powell, C. and J. Shaw. 2018. An overview of Tennessee's herbaria based on digitized specimens. Tennessee Academy of Sciences meeting in Clarksville, TN.
27. Joey Shaw, 2018. *Alley, C. and J. Shaw. Evaluating the ranks of the Tennessee Invasive Pest Plant Council using herbarium specimens data from the developing SERNEC database. Tennessee Academy of Sciences meeting in Clarksville, TN.
28. Joey Shaw, 2018. *Shelton, J. and J. Shaw. 2018. A story map of the existing collections of Augustin Gattinger. Poster presented at the Association of Southeastern Biologists meeting in Myrtle Beach, NC.
29. Joey Shaw, 2018. **Krakowiak, A., **A. Kur, and J. Shaw. 2018. A vascular flora of Orchard Knob: A peephole into the historical limestone glades of Chattanooga, TN. Paper presented at the Association of Southeastern Biologists meeting in Myrtle Beach, NC.
30. Joey Shaw, 2018. **Kur, A. and J. Shaw. 2018. On the effectiveness of illustration in modern botanical keys. Paper presented at the Association of Southeastern Biologists meeting in Myrtle Beach, NC.
31. Joey Shaw, 2018. *Shelton, J. and Joey Shaw. 2018. A preliminary vascular plant flora of the Bare Zone of the Copper Hill Basin, Polk County, TN. Paper presented at the Association of Southeastern Biologists meeting in Myrtle Beach, NC.
32. Joey Shaw, 2018. *Powell, C., **J. Motley, H. Qin, and J. Shaw. 2018. A new application to avert transcription errors in digitization of natural history collections: stopping the "taxonomic telephone." Paper presented at the Association of Southeastern Biologists meeting in Myrtle Beach, NC.
33. Joey Shaw, 2018. **Motley, J., *C. Powell, and J. Shaw. 2018. Developing and testing expedient SERNEC data entry solutions: a proposed modification to the SERNEC/Symbiota portal to speed

data entry from images. Paper presented at the Association of Southeastern Biologists meeting in Myrtle Beach, NC.

34. Joey Shaw, 2018. Shaw, J. *C. Powell, and A. Morris. 2018. Building large digitization teams to achieve high digitization throughput of herbarium specimens. Paper presented at the Association of Southeastern Biologists meeting in Myrtle Beach, NC.
35. Hill Craddock, 2018. Hein, K., Perkins, T., and Craddock, J.H. (2018). Implementing Early Screening Methods to Detect Resistance to *Phytophthora cinnamomi* in First-Backcross Chinese-American Chestnut Hybrids. Poster. February 2018, Posters at the Capitol, Legislative Plaza, Nashville, TN
36. Katherine Kinnear, 2018. Natural History & Rehabilitation of Eastern Gray Squirrels. Guest Speaker at Tennessee Naturalist Program, Audubon Acres, Chattanooga, TN. Jan 2018
37. Katherine Kinnear, 2018. Natural History & Rehabilitation of Eastern Gray Squirrels. Guest Speaker at Chattanooga Zoo, Chattanooga, TN Apr 2018
38. Katherine Kinnear, 2018. Wildlife Rehabilitation of Cottontail Rabbits & Eastern Gray Squirrels Guest Speaker at Ivy Academy, Soddy Daisy, TN Oct 2018
39. Thomas Wilson, 2018. Daniels*, K., Carroll, A., Reynolds, B., and T.P. Wilson. 2018. Comparing Unmanned Aerial Vehicles (UAVs) to Traditional Field Methods in Surveying of Basking Riverine Turtles. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 22, 2018.
40. Thomas Wilson, 2018. Hendricks*, T., Team Salamander* and T.P. Wilson. 2018. Comparative Application of Minimally Invasive Identification Methods in *Plethodon dorsalis* and Microhabitat Analysis. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 22, 2018.
41. Thomas Wilson, 2018. Hunt*, N., Carroll, A., and T.P. Wilson. 2018. Development and Assessment of Spatial Predictive Models for a Rare Tennessee Anuran: Barking Treefrog (*Hyla gratiosa*). Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 22, 2018.
42. Sean Richards, 2018. S. Richards. Utilizing Metabolomics to Diagnosis Fetal Anomalies. Invited Lecture. East Tennessee State University. 31 OCT 2018. Invited presentation.
43. Sean Richards, 2018. S. Richards. Chattanooga: Health Effects from a Legacy of America's Dirtiest City. Kevin A. Johnson Annual Memorial Lecture. Southern Illinois University - Edwardsville. September 26, 2018. Invited presentation.
44. Sean Richards, 2018. S. Richards. Metabolomics as a Tool to Investigate, Predict, and Determine Causes of Adverse Birth Outcomes. College of Arts and Science Seminar Series. Southern Illinois University - Edwardsville September 27, 2018. Invited presentation.
45. Sean Richards, 2018. J. Troisi, L. Sarno, S. Richards, S. Symes, D. Adair, G. Scala, RS Taylor, LME McCowan, A. Fasano, P. Martinelli, M. Guida. Fetal Anomalies Non-Invasive Screening, Is Serum Metabolomics a Viable Way? 45th Annual Meeting of the International Clearinghouse for Birth Defects Surveillance and Research (ICBDSR). September 30-October 4, 2018. Prague, Czech Republic.
46. Sean Richards, 2018. J. Troisi, S. Richards, S. Symes, L. McCowen. Noninvasive Screening of Fetal Anomalies: The Serum Metabolomic Way., June 24, 2018. 58th Teratology Society Annual Meeting in Clearwater, Florida.
47. Fernando Alda, 2019. Isabel A, Alda F. First historical database of exotic freshwater fish species in Tennessee. (Poster presentation). SURF SoCon Undergraduate Research Forum, Spartanburg, SC, USA. November 2nd-3rd 2019.
48. Fernando Alda, 2019. Bertrand J, Carpenter A, LeMay B, Long B, Lyons L, Markham W, McCoy E, Melton J, Musa S, Oglesby C, Smith T, Taveras Y, Warren A, Wightman O, Alda F, Hayes, LD. Intraspecific variation in social organizations of Lagomorphs. UTC Research Dialogues, Chattanooga, TN. April 8th-9th 2019

49. Fernando Alda, 2019. Alda F, Elías DJ, Ludt WB, McMahan C, Chakrabarty P. Compared performance of hybrid-target capture methods in resolving the phylogeny of Heroine cichlids: Are all markers good for all nodes?. Joint Meeting of Ichthyologists and Herpetologists, Snowbird UT, USA. July 24th-28th2019
50. Fernando Alda, 2019. Elías D, Alda F, McMahan C, Chakrabarty P. Revisiting the biogeographic history of the Middle American cichlids (Tribe Heroini). Joint Meeting of Ichthyologists and Herpetologists, SnowbirdUT, USA. July 24th-28th2019.
51. Fernando Alda, 2019. Freeman L, Elías D, Alda F, Chakrabarty P. Mitogenomic relationships among Neotropical cichlids (Heroini: Cichlidae)(Poster presentation). Joint Meeting of Ichthyologists and Herpetologists, Snowbird UT, USA. July 24th-28th2019
52. Jennifer Boyd, 2019. Boyd JN, Odell J, Rogers W, Anderson JT, Baskauf CJ, Brzyski J, Cruse-Sanders J. Reasons for rarity? Exploring adaptive and acclimatory constraints of southeastern endemics in the face of contemporary environmental change. Talk. Organized Oral Session on History, Current Status, and Future of Biodiversity in the Southeast, a Center of Biodiversity in the United States. Ecological Society of America. Louisville, KY. August 2019.
53. Jennifer Boyd, 2019. Cruse-Sanders J. Boyd J, Bonsall M, Anderson JT, Rochford M, Odell J, Rogers W. The role of botanical gardens and partnership in conserving biodiversity in the southeastern U.S. Talk. Organized Oral Session on History, Current Status, and Future of Biodiversity in the Southeast, a Center of Biodiversity in the United States. Ecological Society of America. Louisville, KY. August 2019.
54. Jennifer Boyd, 2019. Wiegand T, Gentry B, McCoy Z, Odell J, Odell H, Bonsall M, Klug H, Boyd JN. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity. Poster. World Congress on Undergraduate Research (WorldCUR). Carl Von Ossietzky Universität, Oldenburg, Germany. May 2019.
55. Jennifer Boyd, 2019. Wiegand T, Gentry B, McCoy Z, Odell J, Odell H, Bonsall M, Klug H, Boyd JN. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity. Poster. National Conference on Undergraduate Research (NCUR). Kennesaw State University, Kennesaw, GA. April 2019.
56. Amy Brock-Hon, 2019. Mathias, C.A., Spivey, K., Collyer, N., Brock-Hon, A.L., McCarragher, S., 2019. Geology of Chattanooga: Engaging the Community with its Foundation: Geological Society of America Abstracts with Programs v. 51, n. 3.
57. Stylianos Chatzimanolis, 2019. Coloration no more. Entomological Collections Meeting, St. Louis, Missouri.
58. Timothy Gaudin, 2019. Invited presentation: Invasion of the flying killer armadillos. Santa Fe Audubon Society, Melrose, FL, November 12, 2019.
59. Azad Hossain, 2019. Blanton, R., and Hossain, A., 2019, Quantitative Estimation of Sediments in Surface Water of the Tennessee River, ASPRS Annual Conference 2019, Denver, CO, January 28-31, 2019.
60. Azad Hossain, 2019. Hossain, A., 2019, Investigating Urban Heat Island (UHI) Impact for the City of Chattanooga, TN Using GIS and Remote Sensing, ASPRS Annual Conference 2019, Denver, CO, January 28-31, 2019.
61. Azad Hossain, 2019. Burleson, J., York, A., Mathias, C., and Hossain, A., 2019, Exploring the Potential of GIS and Remote Sensing Techniques to Study the Impacts of Drought on Plant-Moisture Content in Hamilton County, Tennessee, 2019 annual meeting of GSA Southeastern Section. 28–29 March, Charleston, South Carolina.
62. Azad Hossain, 2019. Bonnette, K. Firat, C., and Hossain, A., 2019, Application of Remote Sensing Technology to Study Coal Ash Spill in River Water, 2019 annual meeting of GSA Southeastern Section. 28–29 March, Charleston, South Carolina.
63. Azad Hossain, 2019. Dohse, S., Hossain, A., Mies, J., and Jones, K., 2019, Geological Mapping of Woodall Shoals, Ga-Sc Using Remote Sensing and Digital Image Processing techniques, 4th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga.

64. Azad Hossain, 2019. York, A., Burleson, J., and Hossain, A., 2019, Investigating the impact of 2016 Southeastern Drought on Vegetation in Hamilton County, TN using GIS and Remote Sensing, 4th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga.
65. Azad Hossain, 2019. Hossain, A., Blanton, R., and Adair, W., 2019, Application of Remote Sensing Technology for Surface Water Quality Studies in Southeast Tennessee, 4th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga.
66. Azad Hossain, 2019. Hall, J. and Hossain, A., 2019, Application of Remote Sensing and GIS to Study the Impact of Urbanization on Surface Water Quality in Hamilton County, TN, April 9-10, 2019. 4th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga.
67. Azad Hossain, 2019. Hossain, A., Blanton, R., and Mathias, C., 2019, Quantitative Remote Sensing of Surface Water Quality in Southeast Tennessee. AGU Fall Meeting, 9-13 December 2019, San Francisco, CA.
68. Azad Hossain, 2019. Hossain, A., Developing computational hydrodynamic and water quality models integrated with satellite observations, The Inaugural Workshop of Southeastern Computational and Geospatial Environmental Hydrology, February 1st, 2019, SimCenter, The University of Tennessee at Chattanooga.
69. Azad Hossain, 2019. Hossain, A., 2019, Watershed Level Urban Growth Estimation in Tennessee Using National Land Cover Database, 2019 annual meeting of GSA Southeastern Section. 28–29 March, Charleston, South Carolina.
70. Azad Hossain, 2019. Hossain, A., and Blanton, R., 2019, Quantitative Estimation of Surface Water Quality Parameters Using Remote Sensing Technology in Southeast Tennessee. Chattanooga Development Symposium, August 6, 2019.
71. Azad Hossain, 2019. Hossain, A., Blanton, R., and Mathias, C., 2019, Surface Water Quality Monitoring Using Remote Sensing Technology in Chattanooga. SWPBA 46th Annual Meeting in Chattanooga, TN October 14th to 17th, 2019.
72. Azad Hossain, 2019. Hossain, A., Blanton, R., and Mathias, C., 2019, Estimating Surface Water Quality Using Remote Sensing Technology, Research Symposium at Chattanooga State Community College, November 15, 2019.
73. Azad Hossain, 2019. Hossain, A., Blanton, R., and Mathias, C., 2019, 2020, Quantitative Remote Sensing of Surface Water Quality in Southeast Tennessee Utilizing Planet Dove Imagery, 69th Annual Southeastern / 55th Annual Northeastern Section Meeting – 2020, 20-22 March 2020, Reston, Virginia (Abstract accepted). Conference cancelled due to COVID-19.
74. Hope Klug, 2019. The operation of mate acquisition revisited, Seminar: Virginia Tech, Ecology, Evolution & Behavior Seminar Series, April 2019
75. Hope Klug, 2019. Hossain, A.K.M, Burleson, J.*, Klug, H., Boyd, J. & Blanton, R. □ Developing a Geographic Information System to map and analyze the conservation status of conifers, ferns, and flowering plants in the United States (Poster Presentation) , Southern Forestry and Natural Resource Management GIS Conference; Athens, GA, December 2019
76. Hope Klug, 2019. Wiegand T*, Gentry B*, McCoy Z□, Odell J□, Odell H□, Bonsall M, Klug H, & Boyd J. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity (Poster Presentation), World Congress on Undergraduate Research (WorldCUR); Carl Von Ossietzky Universität, Oldenburg, Germany, May 2019
77. Hope Klug, 2019. Wiegand T*, Gentry B*, McCoy Z□, Odell J□, Odell H□, Bonsall M, Klug H, & Boyd J. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity (Poster Presentation), National Conference on Undergraduate Research (NCUR); Kennesaw State University, Kennesaw, GA, April 2019
78. Francesca Leasi, 2019. University of Tennessee at Chattanooga. ASPIRE Students Program. Talk title "What small invertebrates tell us about changing environments."

79. Francesca Leasi, 2019. University of Tennessee at Chattanooga. QIIME2 Workshop. Talk title "Introduction to Environmental Genomics."
80. Francesca Leasi, 2019. University of Tennessee at Chattanooga. QIIME2 Workshop. Talk title "Metagenomics: Procedures and Protocols."
81. Francesca Leasi, 2019. Miller A, Leasi F Marine rotifers from the United States. ReSEARCH Dialogues. University of Tennessee at Chattanooga. April 9-10, 2019.
82. Francesca Leasi, 2019. Forbes K, Alda F, Leasi F, Giles D. Phylogenetic distribution of exogenous fatty acid acquisition and membrane incorporation proteins in Gram-negative bacteria. 2019 iCompBio Summer REU, Chattanooga TN.
83. Francesca Leasi, 2019. Curini-Galletti M, Artois T, Di Domenico M, Fontaneto D, Jondelius U, Jorger KM, Leasi F, Martinez Garcia A, Norenburg JL, Todaro ML. Contribution of soft-bodied meiofaunal taxa to Italian marine biodiversity. Italian Zoological Society Symposium. Rome, Italy. Sept 23-26, 2019.
84. Francesca Leasi, 2019. Leasi F, Miller A, De Smet M. Effect of salinity and habitat on rotifer communities from the United States and description of two new species. International Meiofauna Conference, Evora, Portugal. July 7-12, 2019.
85. Francesca Leasi, 2019. Leasi F, Laflamme EM, Sevigny JL, Thomas KK. Integrating biodiversity surveys of meiofauna and microbiome for ecosystem biomonitoring. International Meiofauna Conference, Evora, Portugal. July 7-12, 2019.
86. Francesca Leasi, 2019. Sevigny JL, Westbrook A, Leasi F, Briggs E, Simpson S, Thomas WK. Improved mitochondrial metagenomic methods for analyzing meiofaunal communities. International Meiofauna Conference, Evora, Portugal. July 7-12, 2019.
87. Francesca Leasi, 2019. Sevigny JL, Leasi F, Westbrook A, Simpson SD, Hall J., Morris K, Bik H, Montagna P, Norenburg JL, Thomas WK. The contribution of a diverse set of metazoan draft genomes and improvement of metagenomic analyses of meiofaunal communities. 3rd Global Invertebrate Genomics Alliance Research Conference and Workshop. Curaçao. October 19-22, 2018.
88. Ashley Manning-Berg, 2019. Invited Talk: California State University at Long Beach Dept. of Geology: Surface Environments of the 'Boring Billion'
89. Ashley Manning-Berg, 2019. Invited Talk: The University of California at Riverside Geology Seminar Series: Silicification of Microbial Mats during the 'Boring Billion'
90. Ashley Manning-Berg, 2019. Manning-Berg, Ashley R., Dunham, Jeremy I., Kah, Linda, Tuite, Michael, Williford, Kenneth. 2019. Preservation bias in silicified Proterozoic cyanobacterial mats. Geobiology Society Conference
91. Jonathan Mies, 2019. The Geology of Chattanooga, with Reference to Rock City, Ruby Falls and Ordovician Volcanoes Road Scholars, DoubleTree Hotel, Chattanooga, TN,
92. Jonathan Mies, 2019. The Geology of Chattanooga, with Reference to Rock City, Ruby Falls and Sequatchie Valley Road Scholars, DoubleTree Hotel, Chattanooga, TN
93. DeAnna Beasley, 2019. Beasley, D.E. and Cantu, R. (2019). Ant Picnic: An Integrative STEM Investigation. Chattanooga STEM New Teacher Institute. Education Noyce Scholarship Program.
94. Joey Shaw, 2019. Shaw, J., *C. Powell, **D. Ledesma, **J. Motley, J. Best, and H. Qin. 2019. Specimen Digitization Workflow Optimization Tools—Centralized Technical Services Increase Oversight, Efficiency, and Uniformity Within the Digitization Process. Paper presented at iDigBio Summit IX in Gainesville, FL.
95. Joey Shaw, 2019. **Ledesma, D., *C. Powell, **J. Motley, J. Best, J. Shaw, and H. Qin. 2019. Specimen Digitization Workflow Optimization Tools—The Creation of Neural Networks ColorNet and Modification of Faster R-CNN for CRC detection. Paper presented at iDigBio Summit IX in Gainesville, FL.
96. Joey Shaw, 2019. *Powell, C., **D. Ledesma, **J. Motley, J. Best, H. Qin, and J Shaw. 2019. Specimen Digitization Workflow Optimization Tools—Herbarium Applications for Specimen Auto-processing, or HerbASAP. Paper presented at iDigBio Summit IX in Gainesville, FL.

97. Joey Shaw, 2019. *Alley, C., and J. Shaw. 2019. A reevaluation of Tennessee's non-native plant species using online herbarium specimen data to develop species distribution models. Paper presented at the Botany2019 meeting in Tuscon, AZ.
98. Joey Shaw, 2019. *Powell, C., **J. Motley, H. Chin, and J. Shaw. 2019. "Born digital," introducing a field to database workflow for herbaria. Paper presented at the Botany2019 meeting in Tuscon, AZ.
99. Joey Shaw, 2019. *Powell, C., **J. Motley, H. Chin, and J. Shaw. 2019. "Born digital," enabling a field to database workflow for herbaria. Paper presented at the Society for the Preservation of Natural History Collections in Chicago, IL.
100. Joey Shaw, 2019. *Alley, C. and J. Shaw. 2019. A reevaluation of Tennessee's non-native plant species using online herbarium specimen data to develop species distribution models. Paper presented at the Association of Southeastern Biologists meeting in Memphis, TN.
101. Joey Shaw, 2019. *Powell, C., **J. Motley, H. Chin, and J. Shaw. 2019. "Born digital," addressing the challenges of a field- to-database workflow for collections based research. Paper presented at the Association of Southeastern Biologists meeting in Memphis, TN.
102. Joey Shaw, 2019. **Ledesma, D., *C. Powell, W. Baker, J. Shaw, Y. Lang, and H. Chin. 2019. Using Convolutional Neural Networks to Classify the Reproductive State of Digitized Herbarium Specimens. Paper presented at the Association of Southeastern Biologists meeting in Memphis, TN.
103. Joey Shaw, 2019. Shaw, J., *C. Alley, *C. Powell, *E. Rylander, and *J. Shelton. 2019. Using SERNEC data to plan your next family road trip. Paper presented at the Association of Southeastern Biologists meeting in Memphis, TN.
104. Joey Shaw, 2019. *Shelton, J. and J. Shaw. 2019. The Lost Flora of Tennessee; A Floristic Investigation Into the Copper Hill Basin, Polk County, Tennessee. Paper presented at the Association of Southeastern Biologists meeting in Memphis, TN.
105. Joey Shaw, 2019. *Rylander, E., and J. Shaw. 2019. Using digitized herbarium specimens to predict the potential distributions of Tennessee's historical plant species. Poster presented at the Association of Southeastern Biologists meeting in Memphis, TN.
106. Joey Shaw, 2019. Beck, James, *L. Konrade, and J. Shaw. 2019. A rangewide herbarium-derived dataset indicates high levels of gene flow in black cherry (*Prunus serotina*). Paper presented at the Association of Southeastern Biologists meeting in Memphis, TN.
107. Joey Shaw, 2019. *Parrish, N. and J. Shaw. 2019. Preliminary Vascular Flora of Walls of Jericho State Natural Area, Franklin County, Tennessee. Paper presented at the Tennessee Academy of Sciences meeting in Columbia, TN.
108. Joey Shaw, 2019. *Alley, C. and J. Shaw. 2019. *Saxifraga tridactylites* (Saxifragaceae) is naturalized in the southeastern and northwestern United States, with a center of distribution in Tennessee. Paper presented at the Tennessee Academy of Sciences meeting in Columbia, TN.
109. Joey Shaw, 2019. *Rylander, E. and J. Shaw. 2019. Using digitized herbarium specimens to predict potential distributions of Tennessee's historical angiosperm species. Paper presented at the Tennessee Academy of Sciences meeting in Columbia, TN.
110. Joey Shaw, 2019. *Stepaniuk, M. and J. Shaw. 2019. Comparing biodiversity of power line right-of-way to surrounding forest habitats by conducting a floristic study of these adjacent sites in Marion County, Tennessee. Paper presented at the Tennessee Academy of Sciences meeting in Columbia, TN.
111. Joey Shaw, 2019. Shaw, J. 2019. Release of the Tennessee-Kentucky Plant Atlas: an online, comprehensive resource for the plant species of these two states. Paper presented at the Tennessee Academy of Sciences meeting in Columbia, TN.
112. Hill Craddock, 2019. Genus *Castanea*: Current Research from the Chattanooga Chestnut Project Invited lecture to Biology Sciences Seminar Series, Mississippi State University. 12 April 2019.

113. Katherine Kinnear, 2019. Principles of Wildlife Rehabilitation Guest Speaker at TEAMS Competition at Signal Mountain Middle and High School, Signal Mountain, TN 2019
114. Katherine Kinnear, 2019. Principles of Wildlife Rehabilitation, Guest Speaker at UTC Wildlife and Zoology Club Chattanooga, TN Nov 2019
115. Thomas Wilson, 2019. Daniels*, K, Carroll, A., and T.P. Wilson. 2019. Comparing UAVS to Traditional Field Methods in Surveying of Freshwater Turtles. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 14-17, 2019, Black Mountain, NC.
116. Thomas Wilson, 2019. Childers*, T., Team Salamander, and T.P. Wilson. 2019. *Plethodon dorsalis*: Microhabitat Analysis and Individual Identification. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 14-17, 2019, Black Mountain, NC.
117. Thomas Wilson, 2019. Head*, R, Team Salamander, and T.P. Wilson. 2019. An ongoing assessment of habitat and species richness at Sequatchie Cave at Sequatchie Cave State Natural Area in Marion County, TN National Speleological Society, 2019 Biospeleology Session, Wednesday, June 19th
118. Thomas Wilson, 2019. Head*, R, Team Salamander, and T.P. Wilson. 2019. An ongoing assessment of habitat and species richness at Sequatchie Cave at Sequatchie Cave State Natural Area in Marion County. The Wildlife Society Annual Meeting, Reno NV, Sept. 29 – Oct. 3, 2019.
119. Thomas Wilson, 2019. Bakland*, P.E., Wilson, T.P., Carver, E., Barbosa, J., and B. Reynolds. 2018. Preliminary Results of a Study in Progress Examining the Prevalence of *Batrachochytrium dendrobatidis* (Bd) at Wetlands and Retention Ponds in East Tennessee. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 22, 2018.
120. Bramblett Jeremy, 2019. Bramblett, Jeremy L., T. J. Gaudin, A. B. Heckert, and M. L. Toran. Using Polymer Clays to Make Molds and Casts of Fossils for Teaching and Outreach. 80th Annual Meeting of the Association of Southeastern Biologists in Memphis, April 3rd-7th 2019.
121. Fernando Alda, 2020. Elías DJ, Alda F, McMahan C, Chakrabarty P. Patrones biogeográficos a escala fina en sistemas acuáticos en el Norte del Neotrópico [in Spanish]. Foro virtual: La Tectónica y Fisiografía de
122. Fernando Alda-Pons | CV12 Centroamérica y su Efecto en la Distribución y Evolución de la Diversidad Biológica. Universidad de San Carlos de Guatemala, Guatemala. October 31st 2020
123. Fernando Alda, 2020. Harvey T, Alda F. Revised phylogenetic hypothesis of Neotropical electric fishes using complete mitochondrial genomes (Poster presentation). National Collegiate Honors Council NCHC20. October 8th-9th 2020.
124. Fernando Alda, 2020. De Blonk T, Alda F. Assembly and phylogenomic analysis of complete mitochondrial genomes: a comparative study. iCompBio 2020 Summer REU. The University of Tennessee at Chattanooga, Chattanooga TN, USA. July 29th-30th 2020.
125. Fernando Alda, 2020. Alda F. Putting evolutionary mechanisms in practice—with school supplies. WCTL Annual Instructional Excellence Virtual Conference. The University of Tennessee at Chattanooga, Chattanooga TN, USA. May 5th-6th 2020.
126. Fernando Alda, 2020. Harvey T, Alda F. Revised phylogenetic hypothesis and comparative evolution of mitochondrial genomes of Neotropical weakly electric fishes (Gymnotiformes) (Poster presentation). UTC Research Dialogues. The University of Tennessee at Chattanooga, Chattanooga TN, USA. April 14th-15th 2020. Conference cancelled due to COVID-19 pandemic.
127. Jennifer Boyd, 2020. Rogers, W, Lee D, Platero D, Gentry B, Calles S, Rochford M, Odell J, Anderson JT, Boyd JN, Cruse-Sanders J. Reasons for rarity? Using a common garden approach to investigate the response of rare *Pityopsis ruthii* (Ruth's golden aster) to potential habitat change. Talk. BOTANY. Virtual meeting. August 2020.

133. Stylianos Chatzimanolis, 2020. A new brachypterous Xanthopygina genus from the Northern Andes. Entomological Society of America Annual (Virtual) Meeting. (Invited)
134. Stephanie DeVries, 2020. Conference Presentation: "A modeling tool to estimate land-use impacts on groundwater nitrate concentrations observed at high-capacity pumping wells in an unconfined glacial aquifer." GSA 2020 Connects Online Meeting, October 27, 2020.
135. Stephanie DeVries, 2020. Invited Lecture: "A C++ based model for estimating the concentration of nitrate at a municipal well in central Wisconsin." Presented to the Wisconsin Nitrate Task Force on August 21, 2020.
136. Timothy Gaudin, 2020. Osteological anomalies in the narial anatomy of the extant two-toed sloth *Choloepus* and the homology of the internarial bar in some fossil sloths. Society of Vertebrate Paleontology, 80th Annual Meeting (on-line meeting), October 2020.
137. Azad Hossain, 2020. Hossain, A., and Burleson, J., 2020, Developing a model to map the potential areas for landslide hazards in Hamilton County, TN using geospatial technology, 5th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga., April 14-15, 2020. Abstract accepted. Conference cancelled due to COVID-19.
138. Azad Hossain, 2020. Hossain, A., Blanton, R., and Mathias, C., 2020, Surface water quality estimation in Southeast Tennessee using Sentinel - 2 satellite imagery, 5th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga., April 14-15, 2020. Abstract accepted. Conference cancelled due to COVID-19.
139. Azad Hossain, 2020. Mathias, C., and Hossain, A., 2020, Bathymetric Digital Elevation Model for the Tennessee River, 5th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga., April 14-15, 2020. Abstract accepted. Conference cancelled due to COVID-19.
140. Azad Hossain, 2020. Mathias, C., and Hossain, A., 2020, Developing a Bathymetric Digital Elevation Model for the Tennessee River, Chattanooga Development Symposium 2020, November 10, 2020.
141. Ashley Manning-Berg, 2020. Invited Talk: The University of Cincinnati Department of Geology: How Exceptional is Exceptional Preservation?
142. Ashley Manning-Berg, 2020. Research Dialogues 2020 Modeling of microbial mat decay and implications for the early Earth fossil record
143. Ashley Manning-Berg, 2020. Manning-Berg, Ashley R., Kah, Linda C., 2020. How Exceptional is Exceptional Fossilization? The Characterization of Silicified Mesoproterozoic Microbial Mats of The Angmaat Formation, Baffin Island, Canada. Geological Society of America Abstracts with Programs. Vol 52, No. 6, doi: 10.1130/abs/2020AM-355970
144. DeAnna Beasley, 2020. Invited talk: Beasley, D.E. (2020). Yale Law School: Law, Ethics, and Animals Program. What about Bugs? Why Insects Urgently Need Human Empathy & Action.
145. DeAnna Beasley, 2020. Beasley, D.E. (2020). Citizen science tools for online teaching. Chattanooga STEM New Teacher Institute. Education Noyce Scholarship Program.
- 146.
147. DeAnna Beasley, 2020. Invited talk: Healthy Cities: What insects tell us about urban living. Kennesaw State University. Marietta, GA.
148. Joey Shaw, 2020. **Ledesma, D. and J. Shaw. 2020. Two disparate worlds collide: an overview of the growing mutual relationship between Botany and machine learning. Paper presented at Tennessee Academy of Sciences (online).
149. Joey Shaw, 2020. *Williams, J. and J. Shaw. 2020. The vascular flora of Booker T. Washington State Park, Hamilton County, Tennessee. Paper presented at Tennessee Academy of Sciences (online).
150. Joey Shaw, 2020. *Stepaniuk, M. and J. Shaw. 2020. Using herbarium specimens to trace heavy metal pollutants and compare them pre- and post- 1969 in the formerly most polluted city in the United States, Chattanooga, Tennessee. Paper presented at Tennessee Academy of Sciences (online).

151. Joey Shaw, 2020. *Powell, C, **J. Motley, J. Shaw. 2020. Expediting Specimen Label Creation and Record Transcription Using Born-Digital Field Notes. Paper presented at Botany2020 (online).
152. Joey Shaw, 2020. **Ledesma, D., *C. Powell, J. Shaw, and H. Qin. 2020. Enabling automated herbarium sheet image post-processing through neural network models for color reference chart detection. Paper presented at Association of Southeastern Biologists meeting (online).
153. Joey Shaw, 2020. *Alley, C., *E. Rylander, **J. Dawson, *M. Feely, **D. Ledesma, *N. Parrish, *C. Powell, *J. Shelton, W. Barger, P. Davison, J. Shaw. 2020. *Saxifraga tridactylites* (Saxifragaceae) naturalized in the southeastern and northwestern United States. Paper presented at Association of Southeastern Biologists meeting (online).
154. Joey Shaw, 2020. *Powell, C., J. Shaw. 2020. Abusing regular expressions to extract verbatim coordinates from herbarium specimen labels. 2020. Paper presented at Association of Southeastern Biologists meeting (online).
155. Joey Shaw, 2020. *Powell, C., **D. Ledesma, **J. Motley, J. Best, H. Qin, and J. Shaw. 2020. Development of the Herbarium Application for Specimen Auto-Processing, a realtime processing solution for herbarium specimen images. Paper presented at Association of Southeastern Biologists meeting (online).
156. Joey Shaw, 2020. *Parrish, N. and J. Shaw. 2020. Preliminary vascular flora of Walls of Jericho State Natural Area, Franklin County, Tennessee. Paper presented at Association of Southeastern Biologists meeting (online).
157. Hill Craddock, 2020. Crawford, H. and J.H. Craddock (2020) Silviculture of the American chestnut in the Cumberland uplands of Tennessee. TACF Annual Meeting. Gettysburg, PA. October 19, 2020. https://acf.org/wp-content/uploads/2019/11/393596_TACF_2019-Poster-Abstracts-Booklet.pdf
158. Hill Craddock, 2020. Chestnut Chat 6: The Art of Grafting, with Dr. Hill Craddock, TN-TACF Chapter President and Steve Hoy, Penn State Orchard Manager. Both will offer tips and discuss the successes and challenges of grafting. Friday, May 29, 2020. <https://www.youtube.com/watch?v=A162sq0GLag&feature=youtu.be>
159. Thomas Wilson, 2020. Childers*, T. and T.P. Wilson. 2020. *Plethodon dosalis* (complex): microhabitat analysis. UTC Research Dialogues
160. Thomas Wilson, 2020. Harris*, C. and T.P. Wilson. 2020. Presence and prevalence of *Ophidiomyces ophiodiicola* in Tennessee snake populations: an initial assessment. UTC Research Dialogues
161. Thomas Wilson, 2020. Kelehear*, S., Wilson, T.P., and N. Hunt. 2020. Using Geospatial Analysis to Model for The Cryptic Salamander (*Hemidactylium scutatum*) in Tennessee. UTC Research Dialogues
162. Thomas Wilson, 2020. Childers*, T., Team Salamander, and T.P. Wilson. 2020. PLETHODON DORSALIS (COMPLEX): MICROHABITAT ANALYSIS. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 27, 2020
163. Thomas Wilson, 2020. Head*, R.H., Team Salamander, T.P. Wilson. 2020. An investigation of microhabitat partitioning between two species of troglomenic salamanders, *Eurycea lucifuga* and *Plethodon glutinosus*, at Sequatchie Cave. Southeastern Partners in Amphibian and Reptile Conservation
164. Annual Meeting, Poster, February 27, 2020.
165. Thomas Wilson, 2020. Kelehear*, S., Hunt, N., Team Salamander, and T.P. Wilson. 2020. USING GEOSPATIAL ANALYSIS TO MODEL FOR THE CRYPTIC SALAMANDER *HEMIDACTYLIUM SCUTATUM* IN TENNESSEE. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 27, 2020.
166. Thomas Wilson, 2020. Jaynes*, M., Team Salamander, and T.P. Wilson. 2020. Discord and Harmony: The Regulation of Amphibians and Reptiles Across Southeastern States.

Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 27, 2020.

167. Thomas Wilson, 2020. Bakland*, P.E., Wilson, T.P., Carver, E.A., Barbosa, J.M., and B.R. Reynolds. 2019. Prevalence Assessment of the Amphibian Chytrid Fungus *Batrachochytrium dendrobatidis* across two habitat types in East Tennessee. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 14-17, 2019, Black Mountain, NC.
168. Thomas Wilson, 2020. Harris*, C., Team Salamander and T.P. Wilson. 2020. Prevalence of *Ophidiomyces ophiodiicola* in Tennessee Snake Populations. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 14-17, 2019, Black Mountain, NC.
169. Fernando Alda, 2021. Harvey T, Alda F. Differential selective pressures in mitochondrial protein coding genes between electric and non-electric fishes. Poster Communication. NCHC Annual Conference, Lake Buena Vista FL, USA. October 27th-31st 2021.
170. Fernando Alda, 2021. Harvey T, Alda F. Differential selective pressures in mitochondrial protein coding genes between electric and non-electric fishes. iCompBio 2021 Summer REU. The University of Tennessee at Chattanooga, Chattanooga TN, USA. July 28th-29th 2021.
171. Fernando Alda, 2021. Elías DJ, McMahan CD, Alda F, García-Alzate C, Hart PB, Chakrabarty P. Phylogenomics and biogeographic history of trans-Andean tetras in the genus *Hyphessobrycon* Durbin 1908. Joint Meeting of Ichthyologists and Herpetologists, Phoenix AZ, USA July 21st-23rd (in person), July 26th-27th (virtual) 2021
172. Fernando Alda, 2021. Hart PB, Arnold R, Alda F, Chakrabarty P. Evolutionary relationships of anglerfishes (Lophiiformes) Reconstructed using ultraconserved elements. Joint Meeting of Ichthyologists and Herpetologists, Phoenix AZ, USA July 21st-23rd (in person), July 26th-27th (virtual) 2021.
173. Fernando Alda, 2021. Elías DJ, Alda F, McMahan CD, García-Alzate C, Hart PB, Chakrabarty P. Phylogenomics and biogeographic history of the Middle American Tetras of the genus *Hyphessobrycon* (Characidae). Virtual Evolution, June 21st-25th 2021
174. Fernando Alda, 2021. Shepherd D, Alda F. Chromosome mutation as a mechanism for speciation. Poster Communication. UTC ReSEARCH Dialogues. University of Tennessee at Chattanooga, Chattanooga TN, USA. April 12th-14th 2021
175. Fernando Alda, 2021. Harvey T, Alda F. Revised phylogenetic hypothesis of Neotropical electric fishes using complete mitochondrial genomes. Poster Communication. UTC ReSEARCH Dialogues. University of Tennessee at Chattanooga, Chattanooga TN, USA. April 12th-14th 2021
176. Fernando Alda, 2021. De Blonk T*, Wimberly J*, Schönhuth S, Neely D, Mayden R, Blum MJ, Alda F. Phylogeography of Stonerollers across North America (Campostoma: Cyprinidae). Poster Communication. UTC ReSEARCH Dialogues. University of Tennessee at Chattanooga, Chattanooga TN, USA. April 12th-14th 2021. *These authors contributed equally to this work.
177. Jennifer Boyd, 2021. Boyd JN, Brzyski J, Anderson JT, Baskauf C, Cruse-Sanders J. How do fitness measures, functional traits, and genetic diversity relate to plant species rarity? A meta-analysis of congeneric comparisons. Talk. Ecological Society of America. Virtual Meeting. August 2021.
178. Jennifer Boyd, 2021. Anderson J, Boyd JN, Cruse-Sanders J, Brzyski J, Baskauf C. Eco-evolutionary consequences of rarity. Talk. Reasons for Rarity Colloquium. Botany 2021. Virtual meeting. July 2021.
179. Jennifer Boyd, 2021. Boyd JN, Odell J, Cruse-Sanders J, Rogers W, Anderson JT, Baskauf C, Brzyski J. Comparative plasticity and genetic diversity of rare *Pityopsis ruthii* and its common congener *P. graminifolia*. Talk. Reasons for Rarity Colloquium. Botany 2021. Virtual meeting. July 2021.

180. Jennifer Boyd, 2021. Brzyski J, Boyd JN, Cruse-Sanders J, Baskauf C, Anderson J, Yurek J. Are rare species constrained by their acclimatory and evolutionary ability? A congeneric comparison using Echinacea. Talk. Reasons for Rarity Colloquium. Botany 2021. Virtual meeting. July 2021.
181. Stylianos Chatzimanolis, 2021. Out of Xanthopygus (Coleoptera: Staphylinidae): escape from polyphyly. Entomological Society of America Annual Meeting, Colorado, USA. (Invited - Virtual).
182. Stephanie DeVries, 2021. Conference Presentation: "Microplastics in groundwater and the role of soil thickness in mitigating septic effluent as a source." GSA Connects 2021, Portland, Oregon, October 10, 2021
- 183.
184. David Giles, 2021. The emerging role(s) of exogenous fatty acids in Gram-negative bacteria. Invited Research Talk for students in the NSF ASPIRE program at UTC. January 2021.
185. David Giles, 2021. Fishing for new antimicrobials: Synergism between fatty acids and piscidin treatment. Association of Southeastern Biologists Virtual Meeting. March 2021
186. David Giles, 2021. Houck C, *Giles D, Cotten M. 2021. Fishing for New Antimicrobials: Synergism between Fatty Acids and Piscidin Treatment. Association of Southeastern Biologists Oral Presentation for Virtual Meeting. Also presented for UTC Research Dialogues.
187. Azad Hossain, 2021. Firat, C. and Hossain, A., 2021, Estimating Suspended Sediment Concentrations in the Tennessee River and the Surrounding Tributaries During a High Precipitation Event Using Planetscope Satellite Imagery, The Geological Society of America 2021 Annual Meeting in Portland, Oregon, 10-13 October 2021, Abstract # 371135.
188. Azad Hossain, 2021. William, S. and Hossain, A., 2021, Seeing the carbon for the trees - using remote sensing to model forest carbon, The Geological Society of America 2021 Annual Meeting in Portland, Oregon, 10-13 October 2021, Abstract # 368262.
189. Azad Hossain, 2021. Hossain, A., and Mathias, C., 2021, Remote Sensing of Water Quality in the Tennessee River Using Sentinel-2 Imagery, GSA Southeastern Section - 70th Annual Meeting – 2021, April 1-2, 2021, Online Meeting. GSA Abstract #362338.
190. Azad Hossain, 2021. Hossain, A. and Mathias, C., 2021, Remote Sensing of Water Quality Using Planet Dove Imagery, 6th Annual UTC Research Dialogue, April 12-15, 2021. The University of Tennessee at Chattanooga.
191. Azad Hossain, 2021. Hossain, A., and Mathias, C., 2021, Remote Sensing of Water Quality in the Tennessee River Using Sentinel-2 Imagery, GSA Southeastern Section - 70th Annual Meeting – 2021, April 1-2, 2021, Online Meeting. GSA Abstract #362338.
192. Hope Klug, 2021. The operation of mate acquisition revisited, Seminar: San Diego State University, Biology Department, May 2021
193. Francesca Leasi, 2021. Cline J, Leasi F Effects of dissolved and suspended solids on the biodiversity of freshwater meiofauna from the Tennessee River. 56th National Collegiate Honors Council Annual Conference. Orlando, FL. Oct 27-31, 2021.
194. Ashley Manning-Berg, 2021. Invited Talk: The Paleontological Association of Georgia Fossil Symposium: A Sign of the times: Where do the stromatolites of the Knox Group fit?
195. Ashley Manning-Berg, 2021. Manning-Berg, Ashley R., Lam, Elizabeth K., Riedman, Leigh Anne, Gomes, Maya. 2021. Modern microbial mat taphonomy and its implications on microfossil preservation. Geological Society of America Abstracts with Programs. Vol 53, No. 6. doi: 10.1130/abs/2021AM-371005
196. Ashley Manning-Berg, 2021. Jones, Brendell, Manning-Berg, Ashley R., Roney, Ryan, Santamaria, Jose, Czaja, Andrew D., 2021. Stromatolitic fabrics within chert nodules in the Knox Group of northwest Georgia. Geological Society of America Abstracts with Programs. Vol 53, No. 6. doi: 10.1130/abs/2021AM-371149
197. Jonathan Mies, 2021. The Geology of Chattanooga, with Reference to Rock City and Ruby Falls Road Scholars, DoubleTree Hotel, Chattanooga, TN,

198. DeAnna Beasley, 2021. Invited talk: Beasley, D.E. (2021). Healthy Cities: What insects can tell us about urban living. Cal Poly Pomona, Pomona, CA.
199. DeAnna Beasley, 2021. Invited talk: Beasley, D.E. (2021). Healthy Cities: What insects can tell us about urban living. University of South Florida, Tampa, FL.
200. DeAnna Beasley, 2021. Invited guest lecturer: Beasley, D.E. (2021). What insects can tell us about urban living. North Carolina State University, Raleigh, NC. Wicked Problems, Wolfpack Solutions online course.
201. DeAnna Beasley, 2021. Invited talk: Beasley, D.E. (2021). Healthy Cities: What insects tell us about urban living. Portland State University, Portland O.R. Invited keynote speaker at PSU Graduate Student Colloquium.
202. DeAnna Beasley, 2021. Invited talk: Beasley, D.E. (2021). Healthy Cities: What insects tell us about urban living. San Diego State University, San Diego, CA.
203. DeAnna Beasley, 2021. Invited talk: Beasley, D.E. (2021). Healthy Cities: What insects tell us about urban living. North Carolina State University. Raleigh, N.C.
204. Joey Shaw, 2021. invited talk: Annual Spring Wildflower Pilgrimage in the Great Smoky Mountains National Park 1951-2021. 2021. Paper presented at the Association of Southeastern Biologists meeting (online).
205. Joey Shaw, 2021. Shaw, J. 2021. Tennessee-Kentucky Plant Atlas: an online comprehensive resource for 3600 vascular plant species. Paper presented at the Association of Southeastern Biologists meeting (online).
206. Joey Shaw, 2021. **Ledesma, D. and J. Shaw. 2021. Leveraging statistical analyses and focused expertise for the assignment of botanical coefficients of conservatism values in Tennessee and Kentucky. Paper presented at Association of Southeastern Biologists (online).
207. Joey Shaw, 2021. *Stepaniuk, M. and J. Shaw. 2021. Using herbarium specimens to trace heavy metal pollutants and compare them pre- and post- 1969 in the formerly most polluted city in the United States, Chattanooga, Tennessee. Paper presented at Association of Southeastern Biologists (online).
208. Fernando Alda, 2022. Hanson-Regan W§, Mendoza-Franco EF, Reina RG, Bermingham E, Torchin M, Alda F. Coevolution or geography: What drives parasite diversification? Poster Communication. UTC ReSEARCH Dialogues. University of Tennessee at Chattanooga, Chattanooga TN, USA. April 12th-14th2022.
209. Fernando Alda, 2022. Elías DJ, Alda F, McMahan CD, Brown J, Chakrabarty P. Investigating phylogenetic signal and exploring treespace to illuminate contentious relationships in riverine radiations: Herichthyines cichlids as a case study. Oral Communication. Joint Meeting of Ichthyologists and Herpetologists, Spokane WA, USA. July 27th-30th2022.
210. Fernando Alda, 2022. Alda F, de Blonk T, Wimberly J, Schönhuth S, Neely DA, Mayden RL, Blum MJ. Poster Communication. Joint Meeting of Ichthyologists and Herpetologists, Spokane WA, USA. July 27th-30th2022
211. Fernando Alda, 2022. Bagley JC, Bonner RE, Braswell C, Elías DJ, Glick MJ, Hanson-Regan W§, Morrow K, O'Malley K¶, Parker CE, Smith M¶, Alda F. Poster Communication. Joint Meeting of Ichthyologists and Herpetologists, Spokane WA, USA. July 27th-30th2022
212. Jennifer Boyd, 2022. Boyd JN, Anderson JT, Baskauf C, Brzyski J, Cruse-Sanders J. Eco-evolutionary causes and consequences of rarity in plants. Talk. Ecological Society of America. Montreal, Canada. August 2022.
213. Jennifer Boyd, 2022. Baskauf C, Lindsey A, Rogers W, Boyd J, Anderson J, Brzyski J, Cruse-Sanders J. Comparison of phenotypic plasticity and genetic diversity of a rare and a widespread species of *Boechera* (Brassicaceae), *B. perstellata* and *B. laevigata*. Talk. Botany 2022. Anchorage, AK. July 2022.
214. Jennifer Boyd, 2022. Wiegand T, Corlew A, Rogers W, Cruse-Sanders J, Boyd J. Investigating associations between phenotypic plasticity and geographic distribution in *Helianthus*. Poster. Botany 2022. Anchorage, AK. July 2022.

215. Jennifer Boyd, 2022. Young A, Aborn D, Latta S, Boyd JN. Avian winter habitat selection of avocado farms and intact forest in the Batoruco region of the Dominican Republic. Poster. Ecological Society of America. Montreal, Canada. August 2022.
216. Amy Brock-Hon, 2022. Brock-Hon, 2022. From Nevada soils to Tennessee Depressions: Investigating Features at Various Scales: GSA Abstracts with Programs, v. 54, n. 2.
217. Stylianos Chatzimanolis, 2022. Why are Xanthopygina (Coleoptera: Staphylinidae) rove beetles shiny? Joint Annual Meeting of Entomological Society of America and the Entomological Society of Canada, Vancouver, Canada.
218. Stephanie DeVries, 2022. Invited Lecture: "Diary of a shape-shifting scientist: What's nitrogen got to do with it?" Department of Earth and Planetary Sciences, University of Tennessee at Knoxville, October 20, 2022.
219. Stephanie DeVries, 2022. Conference Presentation: "A modeling tool to estimate land-use impacts on groundwater nitrate concentrations observed at high-capacity pumping wells in an unconfined glacial aquifer." GSA NC/SE Joint Sectional Meeting, Cincinnati, OH, April 7–8, 2022.
220. Jannatul Ferdoush, 2022. Gave an invited presentation on "Regulation of nuclear phase of eukaryotic gene expression by Ubiquitin- Proteasome System (UPS)" in the University of Chittagong, Bangladesh. December 2022.
221. Timothy Gaudin, 2022. Invited presentation: Pangolins, sloths, science & mentorship. East Brainerd Kiwanis. October 28, 2022.
222. Timothy Gaudin, 2022. Invited presentation: (with grad student Carissa Turner) The spread of nine-banded armadillos (*Dasypus novemcinctus*) in Tennessee: Determining habitat preference of nine-banded armadillos in Tennessee with assistance from community science. Innovations in Invasive Species Management Conference, Nashville TN, December 14-15, 2022.
223. David Giles, 2022. Resistance is futile: A 'Trojan Horse' strategy for battling bacterial infections. FLY for Researchers Pitch Competition. UTC Research Dialogue event. April 2022.
224. Azad Hossain, 2022. Faxon, A., Hossain, A., Mies, J., and Shirmeen, T., 2022, Studying Suspended Sediment Concentrations in the South Chickamauga Creek of Chattanooga, TN using Satellite Imagery, Digital Image Processing, and Numeric Modeling. NCUR 2022 @Home on April 4-8, 2022.
225. Azad Hossain, 2022. Faxon, A., Hossain, A., Mies, J., and Shirmeen, T., 2022, Studying Suspended Sediment Concentrations in the South Chickamauga Creek using Satellite Imagery and Numeric Modeling, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
226. Azad Hossain, 2022. Stuart, W., and Hossain, A., 2022, Spatio-Temporal Analysis of Chattanooga, TN's urban forest from 1984 – 2021 Using Remote Sensing, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
227. Azad Hossain, 2022. Campbell, S., and Hossain, A., 2022, Application of Remote Sensing to Study the Potential Impact of 2020 Wildfire Events on the Glaciers of Mount Baker, Washington, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
228. Azad Hossain, 2022. Jones, S., and Hossain, A., 2022, Potential Impact of Ground Water Depletion on Vegetation in the Mississippi Delta Using GRACE and MODIS NDVI Data, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
229. Azad Hossain, 2022. Hossain, A., Campbell, S., and Mies, J., 2022, Investigating Seasonal Variation of Urban Heat Island Effect in the City of Chattanooga, TN Using Remote Sensing, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
230. Azad Hossain, 2022. Anzalone, B., and Hossain, A., 2022, Mapping Relative Variation of Suspended Sediment Concentration in the Tennessee River Using Remote Sensing, UTC Research Dialogues 2022, April 12-13, 2022.
231. Azad Hossain, 2022. Faxon, A., Hossain, A., Mies, J., and Shirmeen, T., 2022, Evaluating the Performance of PlanetScope Imagery to Study Suspended Sediment Concentrations in the

South Chickamauga Creek of Chattanooga, TN, UTC Research Dialogues 2022, April 12-13, 2022.

232. Azad Hossain, 2022. Stuart, W., and Hossain, A., 2022, Mapping the Changes in Urban Forest of Chattanooga, TN from 1984 – 2021, UTC Research Dialogues 2022, April 12-13, 2022.
233. Azad Hossain, 2022. Campbell, S., and Hossain, A., 2022, Application of Remote Sensing to Study the Potential Impact of Wildfire on Glaciers, UTC Research Dialogues 2022, April 12-13, 2022.
234. Azad Hossain, 2022. Jones, S., and Hossain, A., 2022, Studying the Potential Impact of Groundwater Depletion on Surface Vegetation in the Mississippi Delta Using Remote Sensing, UTC Research Dialogues 2022, April 12-13, 2022.
235. Azad Hossain, 2022. Firat, C., and Hossain, A., 2022, Modeling the Impact of Land Use and Land Cover Change on the Water Quality of the South Chickamauga Creek of Chattanooga, Tennessee, UTC Research Dialogues 2022, April 12-13, 2022.
236. Azad Hossain, 2022. Hossain, A., Burleson, J., Springer, H., Welborn, R., and Mies, J., 2022, Landslide Hazards in Hamilton County, TN, UTC Research Dialogues 2022, April 12-13, 2022.
237. Azad Hossain, 2022. Hossain, A., Campbell, S., and Mies, J., 2022, Urban Heat Island Effect in the City of Chattanooga, TN, UTC Research Dialogues 2022, April 12-13, 2022.
238. Azad Hossain, 2022. Mollica, M., and Hossain, A., 2022, Spatio-temporal Analysis of Snowpack on the Rocky Mountains Using GIS, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
239. Azad Hossain, 2022. Bowman, H., Hossain, A., Breetzke, D., 2022, Application of Geospatial Technology to Map the Potential Locations of Chert in the Daniel Boone National Forest, Kentucky, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
240. Azad Hossain, 2022. Firat, C., and Hossain, A., 2022, Investigating the Potential of PlanetScope Imagery to Study Suspended Sediment Concentration in the Tennessee River, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
241. Azad Hossain, 2022. Anzalone, B., and Hossain, A., 2022, Evaluating the Performance of NDSSI, NDTI, and NSMI in the Tennessee River Using Ground Measurements of Turbidity, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
242. Azad Hossain, 2022. Bordash, W., Hossain, A., and Mies, J., 2022, Remote Sensing of Volcanic Eruption Characteristics in the Galapagos Islands, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
243. Hope Klug, 2022. Parental care, filial cannibalism, & the evolution of social behavior, Seminar: University of Illinois, Department of Evolution, Ecology and Behavior, January 2022
244. Hope Klug, 2022. Klug, H. Rasnick, G.*, Jordan, C.*, Farnsley, S., & Lehonen, T. What happens when losers become winners? Nest competition and sexual selection in the sand goby (Poster Presentation), Tvärminne Zoological Station 120-Year-Anniversary Open House, Hanko, Finland, September 2022
245. Hope Klug, 2022. Klug, H., Reyes, E.□, & Langley, C.* Cascading effects of pre-adult survival on sexual selection (Poster Presentation), International Society for Behavioral Ecology Conference, Stockholm, Sweden, August 2022
246. Hope Klug, 2022. Rasnick, G.* & Klug, H. Pre-mating pool resource competition and sexual selection (Poster Presentation), International Society for Behavioral Ecology Conference, Stockholm, Sweden, August 2022
247. Hope Klug, 2022. de Blonk, T.*, Bonsall, M.B., & Klug, H. Links between life history, mate preferences, and the loss and gain of parental care (Poster Presentation), International Society for Behavioral Ecology Conference, Stockholm, Sweden, August 2022
248. Hope Klug, 2022. Jordan, C.*, Rasnick, G.*, Lehtonen, T., Farnsley, S., & Klug, H. Nest competition and sexual selection in the sand goby: what happens when losers become winners?

(Oral Presentation), International Society for Behavioral Ecology Conference, Stockholm, Sweden, August 2022

249. Francesca Leasi, 2022. Bergmeier F, Leasi F, Thomas WK, Seigny JL, Todt C, Kocot, Jerger KM. Solenogastres enter the stage of mitogenomics: comparative characterizations of the first solenogaster mitochondrial genomes. World Congress of Malacology. Munich, Germany. August 1-5, 2022.
250. Francesca Leasi, 2022. Leasi F, Cline J, Elsaed N, Qualey L. First report of meiofauna biodiversity from the Tennessee River. 83rd Annual Meeting of Association of Southeastern Biologists. Little Rock (AK). March 30 - April 2, 2022.
251. Francesca Leasi, 2022. Cline J, Leasi F. The Effects of Dissolved and Suspended Solids on Freshwater Meiofauna. ReSEARCH Dialogues. University of Tennessee at Chattanooga. April 12-13, 2022.
252. Francesca Leasi, 2022. Leasi F, Cline J, Elsaed N, Qualey L. First report of meiofauna biodiversity from the Tennessee River. ReSEARCH Dialogues. University of Tennessee at Chattanooga. April 12-13, 2022.
253. Ashley Manning-Berg, 2022. Invited Talk: University of Missouri Dept. of Geosciences Decomposition and Preservation of microbial mats: An Actualistic Experiment
254. Ashley Manning-Berg, 2022. Invited Talk: Vanderbilt University Dept. of Earth Science Taphonomic Insights into Exceptional Preservation: What's Missing?
255. Ashley Manning-Berg, 2022. Manning-Berg, Ashley R., Lam, Elizabeth Kathleen., 2022. Taphonomic changes and decomposition pathways of microbial consortiums. Geological Society of America Abstracts with Programs. Vol 54, No. 5. doi: 10.1130/abs/2022AM-381907
256. Ashley Manning-Berg, 2022. Tingle, Kelly, Anderson, Ross, Manning-Berg, Ashley R., Darroch, Simon. 2022. Experimental taphonomy of protists. Geological Society of America Abstracts with Programs. Vol 54, No. 5. doi: 10.1130/abs/2022AM-379310
257. Ashley Manning-Berg, 2022. Ritchey, Evan, Manning-Berg, Ashley R., Roney, Ryan. 2022. Petrographic observations of diagenetically altered stromatolitic fabrics of the Knox group, Chatsworth, Georgia. Geological Society of America Abstracts with Programs. Vol 54, No. 5, doi: 10.1130/abs/2022AM-380804
258. Ashley Manning-Berg, 2022. Thompson, Samuel M., Thornton, Quillen., Mollica, Matthew, Manning-Berg, Ashley R., Muhlbauer, Jason., 2022. Mississippian algal structures within the Bangor Limestone formation at Raccoon Mountain, Chattanooga, Tennessee. Geological Society of America Abstracts with Programs. Vol 54, No. 5, doi: 10.1130/abs/2022AM-380242
259. Ashley Manning-Berg, 2022. Mollica, Matthew, Thornton, Quillen., Thompson, Samuel M., Manning-Berg, Ashley R., DeVries, Stephanie. 2022. Assessing anthropogenic effects on water quality in Raccoon Mountain Caverns, Chattanooga, Tennessee. Geological Society of America Abstracts with Programs. Vol 54, No. 5. doi: 10.1130/abs/2022AM-380248
260. Ashley Manning-Berg, 2022. Powers, Caden, White, Cole, DeVries, Stephanie, Manning-Berg, Ashley R., 2022. Exploring a potential method to identify and quantify tire particles from other microplastics. Geological Society of America Abstracts with Programs. Vol 54, No. 5. doi: 10.1130/abs/2022AM-383192
261. Ashley Manning-Berg, 2022. Elizabeth Lam Qualifying changes to microbial communities during decomposition to interpret mat morphologies observed in the rock record UTC Research Dialogues 2022
262. Ashley Manning-Berg, 2022. Ameerah Turner The effect of original morphology on diagenetic pathways of microorganisms prior to fossilization Research Dialogues 2022
263. Jonathan Mies, 2022. The Geology of Chattanooga, with Reference to Rock City and Ruby Falls Road Scholars, DoubleTree Hotel, Chattanooga, TN,

264. Tahmina Shirmeen, 2022. Faxon, A., Hossain, A., Mies, J., and Shirmeen, T., 2022, Studying Suspended Sediment Concentrations in the South Chickamauga Creek using Satellite Imagery and Numeric Modeling, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
265. Tahmina Shirmeen, 2022. Faxon, A., Hossain, A., Mies, J., and Shirmeen, T., 2022, Studying Suspended Sediment Concentrations in the South Chickamauga Creek of Chattanooga, TN using Satellite Imagery, Digital Image Processing, and Numeric Modeling. NCUR 2022, April 4-8, 2022.
266. DeAnna Beasley, 2022. Jarvis, C. (grad researcher) and Beasley, D.E. (2022). Urbanization effects on *Apis mellifera* colonies. Entomological Society of America, Vancouver, British Columbia, Canada.
267. Joey Shaw, 2022. invited talk: Discover Live in America. 2022. The Spring Wildflower Pilgrimage History and Contributions to Science. (online).
<https://www.youtube.com/watch?v=tmFXQOjTd70>
268. Joey Shaw, 2022. invited talk: Nature by the Pint (Chattanooga). 2022. The Spring Wildflower Pilgrimage History and Contributions to Science.
269. Joey Shaw, 2022. invited talk: iNaturalist Tutorial for the Tennessee Native Plant Society on Lookout Mountain. 2022. I prepared this invited presentation but could not make it, so prepped my graduate student Garrett Billings to give the presentation and workshop in my stead.
270. Joey Shaw, 2022. *Brothers, S., and J. Shaw. 2022. Taxonomic, conservation, ecological, and morphological analysis of 4553 plant species of the interior Southeast US. Paper presented at Tennessee Academy of Sciences meeting (Nashville, TN).
271. Joey Shaw, 2022. *McGuigan, C., A. Kur, and J. Shaw. 2022. Assessing the usefulness of botanical illustration in the Guide to the Vascular Plants of Tennessee. Paper presented at Tennessee Academy of Sciences meeting (Nashville, TN).
272. Joey Shaw, 2022. Shaw, J. 2022. Progress toward the Second Edition of the Guide to the Vascular Plants of Tennessee. Paper presented at Tennessee Academy of Sciences meeting (Nashville, TN).
273. Joey Shaw, 2022. *Billings, G., and J. Shaw. 2022. The preliminary vascular plant flora of the Walls of Jericho in Jackson County, Alabama and Franklin County Tennessee; highlights of an endemically rich natural area. Paper presented at Botany2022, Anchorage, AL
274. Joey Shaw, 2022. **Hicks, A., and J. Shaw. 2022. Standards for conducting an iflora: Using iNaturalist to conduct a vascular flora of the Charles B. Henson Cave Preserve in Dade, County, Georgia. Paper presented at Association of Southeastern Biologists meeting (Little Rock, AR).
275. Joey Shaw, 2022. *Billings, G., and J. Shaw. 2022. Preliminary vascular plant flora of the Walls of Jericho in Jackson County, Alabama and Franklin County Tennessee. Paper presented at Association of Southeastern Biologists meeting (Little Rock, AR).
276. Joey Shaw, 2022. **Doss, S., and J. Shaw. 2022. Discovering, counting, and summarizing the National Park specimens at UCHT. Poster presented at Association of Southeastern Biologists meeting (Little Rock, AR).
277. Hill Craddock, 2022. Harden, K.E. and Craddock, J.H. (2022). Oxalic acid leaf disk assays may be another method of screening phenotypic variability in “American” looking *Castanea* hybrid trees. Poster presented at: The American Chestnut Foundation Fall Symposium, October 1, 2022, Asheville, NC.
278. Hill Craddock, 2022. Nguyen, T., and Craddock, J.H. (2022). A small stem assay using hypovirulent *Cryphonectria parasitica* to screen *Castanea dentata* backcross F2 families may set the stage for long-term survival [Poster presentation]. The American Chestnut Foundation Fall Symposium, 30 September-2 October 2022, Asheville, NC, United States.
279. Hill Craddock, 2022. Invited Lecture: Conservation of *Castanea* genetic resources in the Southeast: A Science Café with Dr. Hill Craddock, Atlanta Botanical Garden, Atlanta GA, Thursday, 21 August 2022.

280. Katherine Kinnear, 2022. Creating Connections in Wildlife Education & Rehabilitation, Presenter at UTC Instructional Excellence Retreat May 2022
281. Thomas Wilson, 2022. Cobb*, N.R., Hunt, N.R. Team Salamander*, and T.P. Wilson. 2022. Green Salamander (*Aneides aeneus*) Abundance and Proximity to Hiking Trails in the Greater Chattanooga Area. Annual Meeting-
282. Association of Southeastern Biologists, Little Rock AR.
283. Thomas Wilson, 2022. Gaylord*, E. M., Hunt, N.R., Team Salamander*, and T. P. Wilson. 2022. Developing a Predictive Geospatial Habitat Model for Green Salamanders (*Aneides aeneus*) in East Tennessee. Annual Meeting- Association of Southeastern Biologists, Little Rock AR.
284. Thomas Wilson, 2022. Palaniyappan, E., Liang, YU, Bathi, J.B., Wilson, T.P., Owino, J. and I. Fomunung. 2022. Deep Learning-enabled Assessment of Environment, Social and Economic Benefits of Green Infrastructures. No. 7166. TRISTAN 2022 (The 11th Triennial Symposium on Transportation Analysis conference).
285. Thomas Wilson, 2022. Turner*, C.M., Wilson, T.P., Loughry, W.J., and T. J. Gaudin. 2022. Determining Habitat Preference of Nine-Banded Armadillo in Tennessee with Assistance from Community Science Data. Annual Meeting Southeastern Bat Diversity Network, March 9-10, 2022.
286. Sean Richards, 2022. Sean Richards, Jacopo Troisi, Antonio Raffone, Antonio Travaglino, Gaetano Belli, Carmen Belli, PhD, Santosh Anand, Luigi Giugliano, Pierpaolo Cavallo, Giovanni Scala, Steven Symes, David Adair, Alessio Fasano, Vincenzo Bottigliero, Maurizio Guida. A Serum Metabolomic Signature for Endometrial Cancer Screening in Postmenopausal Women. April 26-27, 2022. 3rd Global Virtual Summit on Gynecology, Obstetrics & Women's Health. World Gynecology 2022. Invited Presentation.
287. Sean Richards, 2022. S. Richards. Toxins of the Great Smoky Mountains National Park. You'll never go in the woods again! April 27-30, 2022. 72nd Annual Spring Wildflower Pilgrimage. Gatlinburg, TN.
288. Sean Richards, 2022. *Robert Charles Dixon, Frank Bailey, Steven Symes and Sean Richards. Assessing the Effects of the Pharmaceutical Contaminant Atorvastatin on the Growth and Metabolome of the Red Swamp Crayfish, *Procambarus clarkia*. Abstracts of the 2022 Society of Environmental Toxicologists and Chemists. November 13-17, 2022. Pittsburgh, PA.
289. Sean Richards, 2022. Jacopo Troisi, *Martina Lombardi, Antonio Raffone, Giovanni Scala, Matteo Delli Carri, Annamaria Landolfi, Sean Richards, Steven Symes. The metabolomic way for the screening of endometrial cancer. Abstracts of the 18th Annual Conference of the Metabolomics Society. June 19-23, 2022. Valencia, Spain.
290. Sean Richards, 2022. Steve Symes, *Martina Lombardi, Giovanni Scala, Matteo Delli Carri, Sean Richards, GEMMA Consortium, Jacopo Troisi. Genome, Environment, Microbiome and Metabolome in Autism (GEMMA) Study: Beyond Biomarker Identification for the Precision Treatment and Early Detection of Autism Spectrum Disorders. Abstracts of the 18th Annual Conference of the Metabolomics Society. June 19-23, 2022. Valencia, Spain.
291. Sean Richards, 2022. *Martina Lombardi, Giovanni Scala, Matteo Delli Carri, Sean Richards, Steven J.K. Symes, Monica Cantile, Egidio Celentano, Sandro Pignata, Nicola Normanno, Jacopo Troisi. A Metabolomics-Based Ensemble Machine Learning Approach for Comprehensive Cancer Screening. Abstracts of the 18th Annual Conference of the Metabolomics Society. June 19-23, 2022. Valencia, Spain.
292. Sean Richards, 2022. Sean Richards, *Martina Lombardi, Steven J.K. Symes, David C. Adair, Giovanni Scala, Matteo Delli Carri, Floriana Palladino, Pierpaolo Cavallo, Lesley McCowan, Rannae Taylor, Laura Sarno, Maurizio Guida, Jacopo Troisi. Beyond the free circulating fetal dna evaluation: a metabolomic based proposal for prenatal screening. Abstracts of the 18th Annual Conference of the Metabolomics Society. June 19-23, 2022. Valencia, Spain.

293. Sean Richards, 2022. Jacopo Troisi, *Martina Lombardi, Antonio Raffone, Giovanni Scala, Matteo Delli Carri, Annamaria Landolfi, Sean Richards, Steven Symes. The metabolomic way for the screening of endometrial cancer. Abstracts of the 4th Annual Conference of the Metabolomics Association of North America. September 16-18, 2022. Edmonton, Alberta, Canada.
294. Sean Richards, 2022. Steve Symes, *Martina Lombardi, Giovanni Scala, Matteo Delli Carri, Sean Richards, GEMMA Consortium, Jacopo Troisi. Genome, Environment, Microbiome and Metabolome in Autism (GEMMA) Study: Beyond Biomarker Identification for the Precision Treatment and Early Detection of Autism Spectrum Disorders. Abstracts of the Abstracts of the 4th Annual Conference of the Metabolomics Association of North America. September 16-18, 2022. Edmonton, Alberta, Canada.
295. Sean Richards, 2022. *Martina Lombardi, Giovanni Scala, Matteo Delli Carri, Sean Richards, Steven J.K. Symes, Monica Cantile, Egidio Celentano, Sandro Pignata, Nicola Normanno, Jacopo Troisi. A Metabolomics-Based Ensemble Machine Learning Approach for Comprehensive Cancer Screening. Abstracts of the Abstracts of the 4th Annual Conference of the Metabolomics Association of North America. September 16-18, 2022. Edmonton, Alberta, Canada.
296. Sean Richards, 2022. Sean Richards, *Martina Lombardi, Steven J.K. Symes, David C. Adair, Giovanni Scala, Matteo Delli Carri, Floriana Palladino, Pierpaolo Cavallo, Lesley McCowan, Rannae Taylor, Laura Sarno, Maurizio Guida, Jacopo Troisi. Beyond the free circulating fetal dna evaluation: a metabolomic based proposal for prenatal screening. Abstracts of the Abstracts of the 4th Annual Conference of the Metabolomics Association of North America. September 16-18, 2022. Edmonton, Alberta, Canada.
297. Bramblett Jeremy, 2022. Bramblett, Jeremy L., L. Gossett, and J. Mies. Using Portable Document Cameras and Portable Digital Microscopes in Both Virtual and On-Class Historical Geology and Petrology Labs. Geological Society of America Abstracts with Programs, v. 54 no. 4, DOI:10.1130/abs/2022NC-374974.
298. Jennifer Boyd, 2023. Boyd JN, Baskauf C, Lindsay A, Anderson JT, Brzyski J, Cruse-Sanders J. Comparative phenotypic plasticity and genetic diversity of rare *Boechera perstellata* and widespread *B. laevigata*. Talk. Ecological Society of America. Portland, OR. August 2023.
299. Jennifer Boyd, 2023. Boyd JN, Anderson JT, Brzyski J, Baskauf C, Cruse-Sanders J. Investigating the eco-evolutionary causes and consequences plant species rarity with meta-analyses. Talk. Botany 2023. Boise, ID. July 2023.
300. Jennifer Boyd, 2023. Boyd JN, Anderson JT, Brzyski J, Baskauf C, Cruse-Sanders J. Eco-evolutionary causes and consequences of rarity in plants. Talk. XV International Seminar, Biodiversity Management and Conservation: Plant Ecology and Conservation. Catania, Italy. June 2023.
301. Jennifer Boyd, 2023. Boyd JN, Beasley D, DeVries S, Farsley S. J. Environmental Studies presents a panel on translational research in the natural science. Panel. UTC Spring Research and Arts Conference. Chattanooga, TN. April 2023.
302. Amy Brock-Hon, 2023. Newbille, A., Anzalone, B., Powers, C., Qualls, H., Thomas, S., Brock-Hon, A., Hon, K.D., McCarragher, S., Meese, P., 2023. Investigation of the morphology of a large sandstone depression on the Cumberland Plateau of Tennessee using Geomorphic Mapping and GPR. GSA Abstracts with Programs, v. 55, no. 6.
303. Stylianos Chatzimanolis, 2023. Systematics and natural history of *Xanthopygina* rove beetles. University of Illinois at Urbana-Champaign. (Invited).
304. Stephanie DeVries, 2023. Invited Lecture: "Hide and Seek: Using Fluorescence to Find the Plastics Hiding in Plain Sight," Department of Earth and Planetary Sciences, University of Tennessee at Knoxville, February 9, 2023.

305. Jannatul Ferdoush, 2023. Gave oral presentation on “Ubiquitin-Proteasome System (UPS) Regulation of an Evolutionarily Conserved PAF1 Involved in Pancreatic Oncogenesis” in the UTC Spring Research and Art Conference. April 2023.
306. Timothy Gaudin, 2023. New forelimb details of Eurotamandua, purported anteater from the middle Eocene of Messel, Germany, reveal extraordinary similarities to palaeonodons (Pholidotamorpha), not to Xenarthra. Society of Vertebrate Paleontology, 83rd Annual Meeting, Cincinnati, OH, October 18, 2023.
307. David Giles, 2023. MAGA: Make Antibiotics Great Again. Lightning Talk. Association of Southeastern Biologists Meeting. March 2023.
308. Azad Hossain, 2023. Campbell, S., and Hossain, A., 2023, Analyzing Greenness Change for the United States from 2000-2020 Using Google Earth Engine, 2023 ASPRS Annual Conference at Geo Week February 13 – 15, Denver, Colorado, Abstract # 215054.
309. Azad Hossain, 2023. Hossain, A. and Campbell, S., 2023, Investigating Urban Heat Island Effect of Small Cities in the United States Using Remote Sensing, 2023 ASPRS Annual Conference at Geo Week February 13 – 15, Denver, Colorado, Abstract # 215052.
310. Azad Hossain, 2023. Firat, C. and Hossain, A., 2023, Analyzing Historical Turbidity in the Tennessee River Using Google Earth Engine, ASPRS Mid-South Conference 2023, April 21, 2023, Oak Ridge National Laboratory, Knoxville, TN.
311. Azad Hossain, 2023. Bassham, P., Stein, J., Cox, M., and Hossain, A., 2023, Tree Canopy & Impervious Surface Coverage Change on Signal Mountain and Walden from 2010-2021, ASPRS 2023 International Technical Symposium, June 12-16, 2023, Virtual.
312. Azad Hossain, 2023. Hossain, A., and Larson, B., 2023, Spatio-Temporal Analysis of Suspended Sediment Concentration in Lake Pontchartrain Using Remote Sensing, ASPRS 2023 International Technical Symposium, June 12-16, 2023, Virtual.
313. Azad Hossain, 2023. Hart, J., and Hossain, A., 2023, Investigating Multiple Turbidity Indices on Parksville Reservoir in Southeastern Tennessee, ASPRS 2023 International Technical Symposium, June 12-16, 2023, Virtual.
314. Azad Hossain, 2023. Latil-Quinn, M., Eviner, V., and Hossain, A., Remote Sensing of Invasive Barbed Goatgrass in Oak Woodland Savannas Using PlanetScope Imagery, ASPRS 2023 International Technical Symposium, June 12-16, 2023, Virtual.
315. Azad Hossain, 2023. Hossain, A. and Campbell, S., 2023, Investigating the Changes in Vegetation Coverage in Mega Cities in the World Using Google Earth Engine, ASPRS Mid-South Conference 2023, April 21, 2023, Oak Ridge National Laboratory, Knoxville, TN.
316. Azad Hossain, 2023. Larson, B. and Hossain, A., 2023, Qualitative Analysis of Algal Blooms in Lake Pontchartrain Using Remote Sensing, ASPRS Mid-South Conference 2023, April 21, 2023, Oak Ridge National Laboratory, Knoxville, TN.
317. Azad Hossain, 2023. Firat, C., Hossain, A. and Chao, X., 2023, Integrating Remote Sensing with Hydrodynamic Models to Investigate Sediment Transport in the Tennessee River Basin, 2023 ASPRS Annual Conference at Geo Week February 13 – 15, Denver, Colorado, Abstract # 214052.
318. Azad Hossain, 2023. Krishnan, P., Wilson, T., Wang, J., Hossain, A., and Hayes, L., 2023, Impact of climate and land cover changes on the social organization of Octodon degus, Oak Ridge Associated Universities’ Project Conference, March 6, 2023, Knoxville, TN.
319. Francesca Leasi, 2023. Invited speaker at the Virtual Rotifer Conference Lecture Series. Talk title “The evolution of salinity tolerance in monogonont rotifers.”
320. Francesca Leasi, 2023. Invited speaker at the workshop: Advances in Rotifer Phylogeny with a focus on Reproductive Traits. University of Texas at El Paso July 31 – Aug 4, 2023. Talk title “Microbiome and ecology of rotifers.”
321. Francesca Leasi, 2023. Invited speaker at the Meiofauna Biodiversity Workshop in Fort Pierce (FL). June 19-30. Talk title "Metabarcoding: a tool to accelerate biodiversity assessments."

322. Francesca Leasi, 2023. Invited speaker at the Virtual Series of Invertebrate Zoology Talks (NoBones). Smithsonian National Museum of Natural History. Talk title "Integrating biodiversity surveys of meiofauna and host-associated microbiome for ecosystem bio-monitoring."
323. Francesca Leasi, 2023. Wakefield G, Bryant K, Leasi F. Preserving lentic freshwater biodiversity in Hamilton County: an assessment of anthropogenic impacts and conservation strategies. Spring Research and Arts Conference. University of Tennessee at Chattanooga. April 12, 2023.
324. Francesca Leasi, 2023. Hanson-Regan W, Leasi F, Alda-Pons F. Invasive and Native Fish Microbiomes: Identifying and Comparing the Inhabitants of Fish Guts. Spring Research and Arts Conference. University of Tennessee at Chattanooga. April 12, 2023.
325. Francesca Leasi, 2023. Royal M, Leasi, Holt B. Meiofauna Serve as a Bioindicator to Reveal Changes in a Freshwater Environment. Baylor Science and Engineering Symposium. Baylor School. Chattanooga. May 9, 2023.
326. Francesca Leasi, 2023. Listen A, Leasi, Holt B. Taxonomic, Phylogenetic, and Functional Turnover of Alaskan Prokaryotes. Baylor Science and Engineering Symposium. Baylor School. Chattanooga. May 9, 2023.
327. Ashley Manning-Berg, 2023. Invited Talk: University of Arkansas Dept of Geology Surface Environment Transitions of the "Boring Billion" and Today
328. Ashley Manning-Berg, 2023. Invited Talk: Tellus Museum Mineral Symposium: Signs of Life:Physical, Chemical Evidence of Life in Ancient Rocks
329. Ashley Manning-Berg, 2023. Thornton, Quillen, Manning-Berg, A.R., and DeVries, S., Identification of microplastics in sediment deposits along a commercialized and non-commercialized segment of Raccoon Mountain Caverns: A tale of two tours. Geological Society of America Abstracts with Programs. Vol. 55, No. 6, doi: 10.1130/abs/2023AM-390742
330. Ashley Manning-Berg, 2023. Newbille, A., Manning-Berg, A.R., Lab-created abiotic silica gels; insights into Proterozoic silicification processes. Geological Society of America Abstracts with Programs. Vol. 55, No. 6, 2023 doi: 10.1130/abs/2023AM-392855
331. Ashley Manning-Berg, 2023. Ritchey, Evan, Manning-Berg, Ashley R., Roney, Ryan. 2022. Petrographic observations of diagenetically altered stromatolitic fabrics of the Knox group, Chatsworth, Georgia. UTC Research Dialogues 2023
332. Ashley Manning-Berg, 2023. Thompson, Samuel M., Thornton, Quillen., Mollica, Matthew, Manning-Berg, Ashley R., Muhlbauer, Jason., 2022. Mississippian algal structures within the Bangor Limestone formation at Raccoon Mountain, Chattanooga, Tennessee. UTC Research Dialogues 2023
333. Ashley Manning-Berg, 2023. Mollica, Matthew, Thornton, Quillen., Thompson, Samuel M., Manning-Berg, Ashley R., DeVries, Stephanie. 2022. Assessing anthropogenic effects on water quality in Raccoon Mountain Caverns, Chattanooga, Tennessee. UTC Research Dialogues 2023
334. Ashley Manning-Berg, 2023. Powers, Caden, White, Cole, DeVries, Stephanie, Manning-Berg, Ashley R., 2022. Exploring a potential method to identify and quantify tire particles from other microplastics. UTC Research Dialogues 2023
335. DeAnna Beasley, 2023. Saikali, J. (Presenter), D. Beasley, C. Acuff, S. McCarragher, H. Smith, G. Valdez, O. Lovett, V. Raczkowski, B. Bellmar, A. Jack, C. Hansen, M. W. Thompson, H. Mohammed, and K. Orf. (August 2023). "The Socio-Ecological Role of Greenways in Urban Systems - An Interdisciplinary Approach." UTC Fall Research Conference. Chattanooga, TN.
336. DeAnna Beasley, 2023. Acuff, C., Beasley, D.E., & McCarragher, S. Examining the Socio-Ecological Role of Greenways in Small and Medium-Sized Cities. Southeastern Conference for Public Administration Annual Conference. September 27–30, 2023. Atlanta, GA.
337. DeAnna Beasley, 2023. Invited panelist: Beasley, D.E., DeVries, S., Farnsley, S., and Boyd, J. (2023). Environmental Studies Program Panel on Translational Research in the Natural Sciences. UTC Research and Arts Conference.

338. Joey Shaw, 2023. *Brothers, S., and J. Shaw. 2023. Taxonomic, conservation, ecological, morphological, and reproductive analysis of 4500 plant species of the interior Southeast US. Paper presented at the Botany2023 meeting in Boise, ID.
339. Joey Shaw, 2023. *Billings, G., and J. Shaw. 2023. Modeling Niche Habitats of Expected Rare Species within the Vascular Flora of the Walls of Jericho, Alabama. Paper presented at the Botany2023 meeting in Boise, ID. (Note: Student failed to attach my name to this presentation.)
340. Joey Shaw, 2023. *Billings, G., and J. Shaw. 2023. A Vascular Flora of the Walls of Jericho in Jackson County, AL. Paper presented at Association of Southeastern Biologists meeting (Winston-Salem, NC).
341. Joey Shaw, 2023. *Towery, Q., and J. Shaw. 2023. Quantifying National Park Specimens at the University of Tennessee at Chattanooga Herbarium (UCHT). Paper presented at Association of Southeastern Biologists meeting (Winston-Salem, NC).
342. Joey Shaw, 2023. *Brothers, S. and J. Shaw. 2023. Taxonomic, conservation, ecological, morphological, and reproductive analysis of 4500 plant species of the interior Southeast US. Paper presented at Association of Southeastern Biologists meeting (Winston-Salem, NC).
343. Joey Shaw, 2023. Shaw, J. 2023. Progress toward the Second Edition of the Guide to the Vascular Plants of Tennessee. Paper presented at Association of Southeastern Biologists meeting (Winston-Salem, NC).

Appendix 4-K Faculty Campus, Community, and Professional Service

1. David Aborn, 2018-2022, Community, Chattanooga Audubon Society, At-large Board Member
2. David Aborn, 2023, Community, Chattanooga Audubon Society, Board President
3. David Aborn, 2022, Community, Chattanooga Audubon Society, Board Vice-president
4. David Aborn, 2017, Community, Tennessee Ornithological Society, Chapter President
5. David Aborn, 2010-present, Community, Tennessee Naturalist Program, Ornithology Instructor
6. David Aborn, 2015-2023, Professional, Association of Field Ornithologists, At-large Board Member
7. David Aborn, 2015-present, Professional, North American Crane Working Group, Board Member
8. David Aborn, 2022-present, Professional, Association of Field Ornithologists, Co-chair of DEIJ Committee
9. David Aborn, 2007-present, University (beyond BGE), Environmental Task Force, Committee Member
10. David Aborn, 2017-2018, University (beyond BGE), University of Tennessee at Chattanooga, Faculty Grants Committee
11. David Aborn, 2020-2022, University (beyond BGE), UTC College of Arts and Sciences, Post-tenure Review Committee
12. David Aborn, 2022-2023, University (beyond BGE), University of Tennessee at Chattanooga, Undergraduate Petitions Committee
13. Fernando Alda, 2023, Professional, Frontiers in Genetics, Editor, Associate Editor
14. Fernando Alda, 2023, Professional, Evolutionary and Population Genetics section Frontiers in Ecology and Evolution and Frontiers in Plant Science, Reviewer
15. Nominanda Barbosa, 2023-present, Community, tnAchieves, Mentor
16. Nominanda Barbosa, 2022-2023, Community, Community engagement from the CAS dean's office, Volunteer service to the Chattanooga Community Kitchen
17. Nominanda Barbosa, 2020-2021, University (beyond BGE), Faculty Senate, Executive Committee Member
18. Nominanda Barbosa, 2021-2022, University (beyond BGE), WCTL Course Development Program, Faculty Fellow
19. Nominanda Barbosa, 2018-Present (except Covid), University (beyond BGE), UTC Undergraduate commencement, Marshall
20. Nominanda Barbosa, 2019-2020, University (beyond BGE), Learning Support and Auxiliary Services UTC committee, Member
21. Nominanda Barbosa, 2021, University (beyond BGE), Gen. Ed. Committee (Work group)-Reimaging General Education, Natural Science"., Member of work group
22. Nominanda Barbosa, 2018, University (beyond BGE), WCTL Certification, Mental Health First Aid
23. Nominanda Barbosa, 2018-2021, University (beyond BGE), First generation college students/UTC, Mentor
24. Nominanda Barbosa, 2020-2021, University (beyond BGE), Faculty Senate, Secretary
25. DeAnna Beasley, 2019, Professional, ASB Poster and Presentation Awards Committee, Member
26. DeAnna Beasley, 2021, University (beyond BGE), Africana Studies Advisory Committee, Member
27. DeAnna Beasley, 2023, University (beyond BGE), Africana Studies Director Search Committee, Member
28. DeAnna Beasley, 2018 - 2021, University (beyond BGE), High-Impacts Practices Award Committee, Member
29. DeAnna Beasley, 2022, University (beyond BGE), Honors College Advisory Committee, Member
30. DeAnna Beasley, 2017-2021, University (beyond BGE), MOCS I3 Planning Committee, Member

31. DeAnna Beasley, 2020-2021, University (beyond BGE), Reimaging General Education Committee, Member
32. Jennifer Boyd, 2023, Community, Tennessee Naturalist Program, Ecology Instructor
33. Jennifer Boyd, 2020, Community, Signal Mountain Middle High School, Science and Technology Club Project Advisor
34. Jennifer Boyd, 2018-present, Community, Town of Signal Mountain, Tree Board Member
35. Jennifer Boyd, 2022-present, Community, Town of Signal Mountain, Tree Board Secretary
36. Jennifer Boyd, 2018, 2019, 2021, Community, Cherokee National Forest, White Fringeless Orchid Monitoring
37. Jennifer Boyd, 2020, 2023, Professional, National Science Foundation, Ad-Hoc Reviewer
38. Jennifer Boyd, 2018, Professional, Elsevier, Book Reviewer
39. Jennifer Boyd, 2018, Professional, Oxford University Press, Book Reviewer
40. Jennifer Boyd, 2018-present, Professional, Southern Appalachian Botanical Society, Castanea (Journal) Subject Editor
41. Jennifer Boyd, 2018-present, Professional, Botanical Society of America, Member
42. Jennifer Boyd, 2018-present, Professional, Ecological Society of America, Member
43. Jennifer Boyd, 2018-present, Professional, Southern Appalachian Botanical Society, Member
44. Jennifer Boyd, 2023, Professional, Botanical Society of America, NSF GRFP (Graduate Research Fellowship Program) Mentor
45. Jennifer Boyd, 2019-present, Professional, National Science Foundation, Panelist
46. Jennifer Boyd, 2023, Professional, Botanical Society of America PLANTS (Preparing Leaders and Nurturing Tomorrow's Scientist), Mentor
47. Jennifer Boyd, 2022-present, Professional, Ecological Society of America, Southeast Chapter Chair
48. Jennifer Boyd, 2020-2023, University (beyond BGE), Faculty Administrative Relations Committee, Committee Member
49. Jennifer Boyd, 2019-2021, University (beyond BGE), College of Arts and Sciences, Diversity Committee Chair
50. Jennifer Boyd, 2018-2019, University (beyond BGE), College of Arts and Sciences, Executive Committee Member
51. Jennifer Boyd, 2018-2019; 2021-present, University (beyond BGE), Faculty Senate, Executive Committee Member
52. Jennifer Boyd, 2020, University (beyond BGE), Walker Center for Teaching and Learning, Faculty Summer Cohort Leader
53. Jennifer Boyd, 2017-present, University (beyond BGE), WCTL Experiential Learning Task Force, Member
54. Jennifer Boyd, 2023-present, University (beyond BGE), Faculty Senate, Past President
55. Jennifer Boyd, 2021-2022, University (beyond BGE), Faculty Senate, President Elect
56. Jennifer Boyd, 2022-2023, University (beyond BGE), Faculty Senate, President Elect
57. Jennifer Boyd, 2018-2019, University (beyond BGE), Faculty Senate, Secretary
58. Amy Brock-Hon, 2018-2023, Community, Multiple interviews with local television news stations covering geologic happenings and geologic history of area., Interviewee
59. Amy Brock-Hon, 2019-2021, Community, Revamp of Creative Discovery Museum 'Unearthed' exhibit, Consultant
60. Amy Brock-Hon, 2019-present, Community, Geology portion of Tennessee Naturalist Group, Lecturer and field camp leader
61. Amy Brock-Hon, 2019, Community, Letter to a Pre-Scientist, Pen-Pal
62. Amy Brock-Hon, 2022-2023, Community, UTC Observatory Star Parties, Speaker
63. Amy Brock-Hon, 2019, Professional, Technical Program Chair of GSA annual meeting in Phoenix, AZ, Chair

64. Amy Brock-Hon, 2021, Professional, Technical Program Chair of GSA Annual Meeting, Portland, OR, Chair
65. Amy Brock-Hon, 2018, Professional, Technical Program Co-Chair of GSA Annual Meeting, Indianapolis, IN, Co-Chair
66. Amy Brock-Hon, 2020, Professional, Technical Program Co-Chair of GSA Connects Online Meeting, Co-Chair
67. Amy Brock-Hon, 2017-2022, Professional, Annual Program Committee for GSA, Committee Member
68. Amy Brock-Hon, 2018, Professional, GSA Strategic Planning Program Task Force, Committee Member
69. Amy Brock-Hon, 2018-2022, Professional, SE Section of the GSA Student Support Committee, Committee Member
70. Amy Brock-Hon, 2018-2023, Professional, UTC Campus Rep for GSA, Member
71. Amy Brock-Hon, 2020-present, University (beyond BGE), Assistant Director, Clarence T. Jones Observatory, Assistant Director
72. Amy Brock-Hon, 2018, University (beyond BGE), CAS Assistant Dean Search Committee, Committee Member
73. Amy Brock-Hon, 2023, University (beyond BGE), CAS Natural Sciences and Math PTR Subcommittee, Committee Member
74. Amy Brock-Hon, 2018, University (beyond BGE), Ruth Holmberg Grant Review Committee, Committee Member
75. Amy Brock-Hon, 2019-2022, University (beyond BGE), UTC CAS Executive Committee, Committee Member
76. Amy Brock-Hon, 2020-present, University (beyond BGE), UTC Clarence T. Jones Observatory Advisory Board, Committee Member
77. Amy Brock-Hon, 2020-2022, University (beyond BGE), UTC General Education Curriculum Committee, Committee Member
78. Amy Brock-Hon, 2021-2022, University (beyond BGE), UTC Reimagining General Education Natural Sciences Working Group, Committee Member
79. Ethan Carver, 2023, Community, Baylor School, Science and Engineering Symposium, Judge
80. Ethan Carver, 2022, Community, Baylor School, Science and Engineering Symposium, Judge
81. Ethan Carver, 2019, Community, Lakesite Academy of Math, Science and Technology, Career Day, Presenter
82. Ethan Carver, 2023-present, Professional, Conference of Southern Graduate Schools; Thesis Award Committee, Chair
83. Ethan Carver, 2022, Professional, Conference of Southern Graduate Schools; 3MT Judge, Judge
84. Ethan Carver, 2021-2022, Professional, Conference of Southern Graduate Schools; Executive Committee, Member
85. Ethan Carver, 2018-2021 and 22-23, Professional, Conference of Southern Graduate Schools; Thesis Award Committee, Member
86. Ethan Carver, 2018-present, Professional, Council of Graduate Schools: Advocacy Ambassadors Network, Member
87. Ethan Carver, 2018-2021, Professional, Tennessee Conference of Southern Graduate Schools; Thesis Award Committee, Member
88. Ethan Carver, 2023-present, Professional, Tennessee Conference of Southern Graduate Schools, Past President
89. Ethan Carver, 2021-2023, Professional, Tennessee Conference of Southern Graduate Schools, President
90. Ethan Carver, 2019-2021, Professional, Tennessee Conference of Southern Graduate Schools, President-elect

91. Ethan Carver, 2016-present, Professional, Conference of Southern Graduate Schools, Representative
92. Ethan Carver, 2016-present, Professional, Council of Graduate Schools, Representative
93. Ethan Carver, 2018, University (beyond BGE), Compliance and Equity Subcommittee, Athletics Board, Chair
94. Ethan Carver, 2018, University (beyond BGE), Graduate School Recruitment and Marketing Coordinator Hiring Committee, Chair
95. Ethan Carver, 2014-present, University (beyond BGE), Institutional Animal Care and Use Committee, Chair
96. Ethan Carver, 2018, University (beyond BGE), Athletics Board, Member
97. Ethan Carver, 2016-present, University (beyond BGE), Banner Core Team, Member
98. Ethan Carver, 2019-present, University (beyond BGE), Curriculum Team, Member
99. Ethan Carver, 2016-present, University (beyond BGE), ex officio, Graduate Council, Member
100. Ethan Carver, 2016-present, University (beyond BGE), ex officio, Graduate Council: Appeals Committee, Member
101. Ethan Carver, 2016-present, University (beyond BGE), ex officio, Graduate Council: Best Practice Committee, Member
102. Ethan Carver, 2018-present, University (beyond BGE), Information Technology Advisory Council, Member
103. Ethan Carver, 2020, University (beyond BGE), OPEIR Executive Director Hiring Committee, Member
104. Ethan Carver, 2018, University (beyond BGE), PA Director Hiring Committee, Member
105. Ethan Carver, 2020-2021, University (beyond BGE), Police Advisory Committee, Member
106. Ethan Carver, 2021-2023, University (beyond BGE), SACSCOC Reaffirmation Leadership Committee, Member
107. Ethan Carver, 2020-2021, University (beyond BGE), Strategic Planning Steering Committee, Teaching and Learning Subcommittee, Member
108. Ethan Carver, 2022-2023, University (beyond BGE), Ukraine Project Task Force, Member
109. Ethan Carver, 2019-2020, University (beyond BGE), UT-Instructional Committee, Member
110. Ethan Carver, 2022, University (beyond BGE), UTAA Outstanding Teacher Award Committee, Member
111. Ethan Carver, 2021-present, University (beyond BGE), UTC Global Education Advisory Board, Member
112. Ethan Carver, 2018, University (beyond BGE), UTC Registrar Hiring Committee, Member
113. Stylianos Chatzimanolis, 2023, Community, Audobon Acres, Insect collecting at night event
114. Stylianos Chatzimanolis, 2022, Community, Spring Wildflower Pilgrimage, Great Smoky Mountains National Park, Leader
115. Stylianos Chatzimanolis, 2019, Community, Spring Wildflower Pilgrimage, Great Smoky Mountains National Park, Leader
116. Stylianos Chatzimanolis, 2018, Community, Spring Wildflower Pilgrimage, Great Smoky Mountains National Park, Leader
117. Stylianos Chatzimanolis, 2020, Community, Apison Elementary, Presenter
118. Stylianos Chatzimanolis, 2018, Community, Apison Elementary, Presenter
119. Stylianos Chatzimanolis, 2018, Community, Montessori School, Presenter
120. Stylianos Chatzimanolis, 2019, Community, Palace Theater, Stand Up for Science
121. Stylianos Chatzimanolis, 2021, Community, Channel 3 (WRCB), TV interview

122. Stylianos Chatzimanolis, 2018, Community, Channel 3 (WRCB), TV interview
123. Stylianos Chatzimanolis, 2015-2020, Professional, The Coleopterist Bulletin, Book Review Editor
124. Stylianos Chatzimanolis, 2018, Professional, Democritus University of Thrace, Greece, External reviewer for promotion
125. Stylianos Chatzimanolis, 2023, Professional, University of Texas at Tyler, External reviewer for promotion
126. Stylianos Chatzimanolis, 2019, Professional, National Science Foundation, Panelist
127. Stylianos Chatzimanolis, 2018, Professional, Entomological Society of America, Poster Judge
128. Stylianos Chatzimanolis, 2020, Professional, Entomological Society of America, Poster Judge
129. Stylianos Chatzimanolis, 2022, Professional, Alpine Entomology, Reviewer
130. Stylianos Chatzimanolis, 2021, Professional, Arthropods Systematics & Phylogeny, Reviewer
131. Stylianos Chatzimanolis, 2022, Professional, BMC Ecology and Evolution, Reviewer
132. Stylianos Chatzimanolis, 2019, Professional, Contribution to Zoology, Reviewer
133. Stylianos Chatzimanolis, 2021, Professional, Cretaceous Research, Reviewer
134. Stylianos Chatzimanolis, 2022, Professional, InsectSystematics and Evolution, Reviewer
135. Stylianos Chatzimanolis, 2019, Professional, Journal of Natural History, Reviewer
136. Stylianos Chatzimanolis, 2021, Professional, Journal of Natural History, Reviewer
137. Stylianos Chatzimanolis, 2019, Professional, Journal of Paleontology, Reviewer
138. Stylianos Chatzimanolis, 2019, Professional, Molecular Phylogenetics and Evolution, Reviewer
139. Stylianos Chatzimanolis, 2021, Professional, National Science Foundation, Reviewer
140. Stylianos Chatzimanolis, 2022, Professional, National Science Foundation, Reviewer
141. Stylianos Chatzimanolis, 2019, Professional, Organisms Diversity & Evolution, Reviewer
142. Stylianos Chatzimanolis, 2022, Professional, Palaeoworld, Reviewer
143. Stylianos Chatzimanolis, 2018, Professional, Paleontology, Reviewer
144. Stylianos Chatzimanolis, 2019, Professional, Papéis Avulsos de Zoologia, Reviewer
145. Stylianos Chatzimanolis, 2022, Professional, Specimen, Reviewer
146. Stylianos Chatzimanolis, 2018, Professional, Systematic Entomology, Reviewer
147. Stylianos Chatzimanolis, 2019, Professional, Systematic Entomology, Reviewer
148. Stylianos Chatzimanolis, 2019, Professional, Systematic Entomology, Reviewer
149. Stylianos Chatzimanolis, 2019, Professional, Systematic Entomology, Reviewer
150. Stylianos Chatzimanolis, 2019, Professional, Systematics and Biodiversity, Reviewer
151. Stylianos Chatzimanolis, 2018, Professional, The Coleopterist Bulletin, Reviewer
152. Stylianos Chatzimanolis, 2019, Professional, The Coleopterist Bulletin, Reviewer
153. Stylianos Chatzimanolis, 2022, Professional, The Great Lakes Entomologist, Reviewer
154. Stylianos Chatzimanolis, 2019, Professional, Transactions of the American Entomological Society, Reviewer
155. Stylianos Chatzimanolis, 2019, Professional, Transactions of the American Entomological Society:, Reviewer
156. Stylianos Chatzimanolis, 2021, Professional, ZooKeys, Reviewer
157. Stylianos Chatzimanolis, 2019, Professional, Zoological Journal of the Linnean Society, Reviewer
158. Stylianos Chatzimanolis, 2022, Professional, Zoologischer Anzeiger, Reviewer
159. Stylianos Chatzimanolis, 2018, Professional, Zootaxa, Reviewer
160. Stylianos Chatzimanolis, 2019, Professional, Zootaxa, Reviewer
161. Stylianos Chatzimanolis, 2019, Professional, Zootaxa, Reviewer

162. Stylianos Chatzimanolis, 2021, Professional, Zootaxa, Reviewer
163. Stylianos Chatzimanolis, 2013-present, Professional, Biodiversity Data Journal, Subject Editor
164. Stylianos Chatzimanolis, 2012-2020, Professional, Journal of Paleontology, Subject Editor
165. Stylianos Chatzimanolis, 2018-2019, University (beyond BGE), Honor Court, Chair
166. Stylianos Chatzimanolis, 2016-present, University (beyond BGE), Honor Court, Committee Member
167. Stylianos Chatzimanolis, 2019-present, University (beyond BGE), Student Conduct Board, Committee Member
168. Hill Craddock, 1997-present, Community, The American Chestnut Foundation, Board Member
169. Hill Craddock, 2022-2023, Community, U.S. Dept. Agriculture Regional Project NE1833, Chair
170. Hill Craddock, 2020-2021, Community, Virtual Spring Wildflower Pilgrimage, Identifier
171. Hill Craddock, 2022-present, Community, Spring Wildflower Pilgrimage, Great Smoky Mountains National Park, Leader
172. Hill Craddock, 2009-2019, Community, Chattanooga Tree Commission, member
173. Hill Craddock, 1999-present, Community, U.S. Dept. Agriculture Regional Project NE1833 (formerly:NE140 and NE1333) Biological Improvement of Chestnut through Technologies that Address Management of the Species, its Pathogens and Pests ((Secretary 1999; Chairman 2000, 2017), Member
174. Hill Craddock, 2018-present, Community, The Tennessee Chapter of The American Chestnut Foundation, President
175. Hill Craddock, 2018-present, Professional, American Society for Horticultural Science, Member, reviewer
176. Hill Craddock, 2018-present, Professional, International Society for Horticultural Science, Member, reviewer
177. Hill Craddock, 2018-present, Professional, The American Society of Plant Taxonomists, Member, reviewer
178. Hill Craddock, 2018-present, Professional, Various, Reviewer
179. Hill Craddock, 2018-present, University (beyond BGE), The Linda T. Collins Arboretum, Chair
180. Hill Craddock, 2018-present, University (beyond BGE), UTC Landscape Committee, Chair
181. Hill Craddock, 2023, University (beyond BGE), Beta Beta Beta Biological Honor Society, Faculty advisor
182. Hill Craddock, 2018-present, University (beyond BGE), UTC Men's Ultimate, Faculty advisor
183. Hill Craddock, 2018-present, University (beyond BGE), UTC Women's Ultimate, Faculty advisor
184. Hill Craddock, 2018-present, University (beyond BGE), UTC Council of Scholars, Member
185. Hill Craddock, 2022-present, University (beyond BGE), UTC Curriculum Committee, member
186. Hill Craddock, 2020-2022, University (beyond BGE), UTC Petitions Committee, member
187. Hill Craddock, 2020-2024, University (beyond BGE), UTC Petitions Committee, member
188. Hill Craddock, 2018-present, University (beyond BGE), UTC Tree Advisory Committee, Member

189. Stephanie DeVries, 2021, Professional, Journal of Environmental Water Quality, Editor
190. Stephanie DeVries, 2023, Professional, American Geophysical Union, Reviewer
191. Stephanie DeVries, 2020, Professional, Environmental Pollution, Reviewer
192. Stephanie DeVries, 2022, Professional, Environmental Science and Pollution Research, Reviewer
193. Stephanie DeVries, 2020, Professional, Environmental Science and Pollution Research, Reviewer
194. Stephanie DeVries, 2022, Professional, Frontiers in Water, Reviewer
195. Stephanie DeVries, 2020, Professional, Intl Journal of Env'tl Research & Public Health, Reviewer
196. Stephanie DeVries, 2020, Professional, Journal of Horticulture Science and Forestry, Reviewer
197. Stephanie DeVries, 2020, Professional, Journal of Soils and Sediments, Reviewer
198. Stephanie DeVries, 2020, Professional, Journal of the International Society for Microbial Ecology, Reviewer
199. Stephanie DeVries, 2021, Professional, National Science Foundation, Reviewer
200. Stephanie DeVries, 2021, Professional, Science of the Total Environment, Reviewer
201. Stephanie DeVries, 2021, Professional, Water Research, Reviewer
202. Stephanie DeVries, 2020, University (beyond BGE), Faculty Grants, committee member
203. Stephanie DeVries, 2021, University (beyond BGE), Faculty Senate, committee member
204. Stephanie DeVries, 2022, University (beyond BGE), Walker Center for Teaching and Learning, Committee Member
205. Sarah Farnsley, 2020-2023, Community, Chattanooga Audubon Society, Board Member
206. Sarah Farnsley, 2022-2023, Community, Chattanooga Audubon Society, Secretary
207. Sarah Farnsley, 2022, University (beyond BGE), Faculty Senate NTT Committee, Committee Chair
208. Sarah Farnsley, 2023, University (beyond BGE), Learning Community Committee, Committee Member
209. Sarah Farnsley, 2018-2023, University (beyond BGE), Honor Court, Hearing Officer
210. Sarah Farnsley, 2018, University (beyond BGE), Faculty Senate, Senator
211. Sarah Farnsley, 2023, University (beyond BGE), Total Organizational Health Task Force, Member
212. Timothy Gaudin, 9 in 2022, 1 in 2019, 2 in 2018, Community, Interviewed by media outlets for research-related stories, INterviewee
213. Timothy Gaudin, 2022, Community, East Brainerd Kiwanis, Invited Presenter
214. Timothy Gaudin, 2019, Community, Santa Fe Audubon Society in Melrose, FL, Invited Presenter
215. Timothy Gaudin, 2022, 2023, Community, Spring Wildflower Pilgrimage, Great Smoky Mountains National Park, Leader
216. Timothy Gaudin, 2022, Community, Reflection Riding during their Fall Pollinator Festival, My Mammalogy class students (BIOL 4140) and I conducted a public outreach program
217. Timothy Gaudin, 3 in 2023, 2 in 2022, 2 in 2018, Community, Multiple, Presenter
218. Timothy Gaudin, 2021 - present, Professional, Journal of Mammalian Evolution, Associate Editor
219. Timothy Gaudin, 2021, Professional, Paleoneurology of Amniotes: New Directions in the Study of Fossil Endocasts. M.T. Dozo and T. Macrini (eds.)(2021), Book Reviewer
220. Timothy Gaudin, 2020, Professional, Society for the Study of Mammalian Evolution, Convener for Symposium
221. Timothy Gaudin, 2018 - present, Professional, Eastern Paleontologist, Editorial Board member

222. Timothy Gaudin, 2022 - present, Professional, Frontiers in Mammal Science, specialty section: Evolution, Anatomy and the Palaeosciences, Editorial Board member
223. Timothy Gaudin, 2018 - present, Professional, Journal of Mammalian Evolution, Editorial Board member
224. Timothy Gaudin, 2020, Professional, 30th Colloquium on the Conservation of Mammals of the Southeastern United States, Athens, GA, Judge for student talks
225. Timothy Gaudin, 2018-Present, Professional, Society for the Study of Mammalian Evolution, President
226. Timothy Gaudin, 2023, Professional, Ameghiniana, Reviewer
227. Timothy Gaudin, 2022, Professional, Edentata, Reviewer
228. Timothy Gaudin, 2023, Professional, Frontiers in Veterinary Science, Reviewer
229. Timothy Gaudin, 2022, Professional, Heliyon, Reviewer
230. Timothy Gaudin, 2021, Professional, Journal of Anatomy, Reviewer
231. Timothy Gaudin, 2023, Professional, Journal of Cave and Karst Studies, Reviewer
232. Timothy Gaudin, 2019, Professional, Journal of Mammalian Evolution, Reviewer
233. Timothy Gaudin, 2019, Professional, Journal of Paleontology, Reviewer
234. Timothy Gaudin, 2020, Professional, Journal of Paleontology, Reviewer
235. Timothy Gaudin, 2018, Professional, Journal of Systematic Paleontology, Reviewer
236. Timothy Gaudin, 2018, Professional, Journal of Vertebrate Paleontology, Reviewer
237. Timothy Gaudin, 2021, Professional, Journal of Vertebrate Paleontology, Reviewer
238. Timothy Gaudin, 2022, Professional, Journal of Vertebrate Paleontology, Reviewer
239. Timothy Gaudin, 2018, Professional, Nature:Ecology & Evolution, Reviewer
240. Timothy Gaudin, 2019, Professional, Palaeontology, Reviewer
241. Timothy Gaudin, 2021, Professional, Southeastern Naturalist, Reviewer
242. Timothy Gaudin, 2018 - present, Professional, AIB SEVOLISTTN, List Manager
243. Timothy Gaudin, 2018 - present, Professional, Multiple, Consultant
244. Timothy Gaudin, Fall 2018 - Spring 2019, University (beyond BGE), Search committee for new department head in Dept of Chemistry & Physics,, Chair
245. Timothy Gaudin, Fall 2020 - Spring 2023, University (beyond BGE), Academic Standards Committee, Committee Member
246. Timothy Gaudin, Fall 2017 - Spring 2018, University (beyond BGE), Faculty Budget and Economic Status Committee, Committee Member
247. Timothy Gaudin, Fall 2018 - Spring 2019, University (beyond BGE), Faculty Senate Academic Standards Committee, Committee Member
248. Timothy Gaudin, Fall 2019 - Spring 2020, University (beyond BGE), Classroom Technology Committee, Committee Member
249. Timothy Gaudin, Fall 2023 - Spring 2024, University (beyond BGE), Faculty Budget and Economic Status Committee, Committee Member
250. Loren Hayes, 2021-present, Community, Developing educational activities for local schools, collaboration with UTC School of Education
251. Loren Hayes, 2011-present, Professional, Journal of Mammalogy, Associate Editor
252. Loren Hayes, 2020-present, Professional, Frontiers in social evolution seminar series (international, remote), co-coordinator
253. Loren Hayes, 2022, Professional, NERC (Canada), Proposal reviewer
254. Loren Hayes, 2019, 2021, Professional, Animal Behaviour, Reviewer
255. Loren Hayes, 2023, Professional, Behavioral Ecology, Reviewer
256. Loren Hayes, 2022, Professional, Behavioral Ecology and Sociobiology, Reviewer
257. Loren Hayes, 2019, Professional, Behavioral Processes, Reviewer
258. Loren Hayes, 2023, Professional, Ethology, Reviewer
259. Loren Hayes, 2021, Professional, Mammalia, Reviewer
260. Loren Hayes, 2023, Professional, Mammalian Biology, Reviewer

261. Loren Hayes, 2020, Professional, National Science Foundation, reviewer
262. Loren Hayes, 2022, Professional, Proceedings of the Royal Society of London, Reviewer
263. Loren Hayes, 2021, 2022, University (beyond BGE), Wildlife Pilgrimage, Activity leader
264. Loren Hayes, 2022-present, University (beyond BGE), CAS Executive committee, Committee Member
265. Loren Hayes, 2019, University (beyond BGE), Faculty Grants, Committee Member
266. Loren Hayes, 2020, 2021, 2022, University (beyond BGE), Faculty Rating of Administrators, Committee Member
267. Loren Hayes, 2019, 2020, University (beyond BGE), UTC SEARCH awards, Reviewer
268. Azad Hossain, 2022-Present, Community, Signal Mountain Tree Board, Helping to map tree canopy using geospatial technology
269. Azad Hossain, 2022-Present, Community, Northside Neighborhood House, Helping with geospatial technology for mapping
270. Azad Hossain, 2017, Community, Chattanooga Geology Club, Invited lecture on landslides
271. Azad Hossain, 2018, 2019, Community, Thrasher Elementary School, Invited lecture on rocks and minerals
272. Azad Hossain, 2020, Community, Signal Mountain Middle and High School, Invited lecture on urban development and sustainability
273. Azad Hossain, 2023, Community, Brainerd High School Future Ready Kick-Off Event, Invited lecturer
274. Azad Hossain, 2018, Community, Red Bank Lion's Club at Chattanooga., Invited lecturer on landslides
275. Azad Hossain, 2020, Community, Chattanooga STEM School, Mentor
276. Azad Hossain, 2020, Community, Chattanooga STEM School, Workshop organizer
277. Azad Hossain, 2020, Community, Chattanooga Regional Science and Engineering Fair, Judge
278. Azad Hossain, 2022, 2023, Community, Baylor School Science Symposium, Judge
279. Azad Hossain, 2019, Community, Chattanooga Times Free Press, Inc., Several interviews on Chattanooga's landslide hazard
280. Azad Hossain, 2018, 2019, 2020, 2021, Community, TV Interview (Channel 3, Channel 9, and News 12), Several interviews on Chattanooga's landslide hazard
281. Azad Hossain, 2018, Community, Collegedale Library & Learning Center's Kids Club, Show and tell on rocks and minerals
282. Azad Hossain, 2021 - Present, Professional, Sustainability, Review Board Member
283. Azad Hossain, 2018-2020, Professional, Applied Science, Reviewer
284. Azad Hossain, 2021-2022, Professional, Marine Geodesy, Reviewer
285. Azad Hossain, 2016-2017, Professional, Natural Hazard, Reviewer
286. Azad Hossain, 2023, Professional, PLOS 1, Reviewer
287. Azad Hossain, 2018 - Present, Professional, Remote Sensing, Reviewer
288. Azad Hossain, 2021, Professional, Royal Society Open Science, Reviewer
289. Azad Hossain, 2017, Professional, Scientific Reports, Reviewer
290. Azad Hossain, 2020-2021, Professional, Sensor, Reviewer
291. Azad Hossain, 2017 - Present, Professional, Sustainability, Reviewer
292. Azad Hossain, 2017-2021, Professional, Water, Reviewer
293. Azad Hossain, 2019, Professional, Water Resources Research, Reviewer
294. Azad Hossain, 2017, 2023, Professional, American Society of Photogrammetry and Remote Sensing, Conference Moderator
295. Azad Hossain, 2023, Professional, University of Calgary, External PhD Examiner

296. Azad Hossain, 2020, Professional, Connecticut Sea Grant and New York Sea Grant, Grant proposal reviewer
297. Azad Hossain, 2022 - Present, Professional, Remote Sensing, Guest Editor
298. Azad Hossain, 2019, 2023, Professional, Road Scholar Program Geology of Chattanooga, Invited lecturer
299. Azad Hossain, 2004 - Present, Professional, American Geophysical Union, Member
300. Azad Hossain, 2003 - Present, Professional, American Society of Photogrammetry and Remote Sensing, Member
301. Azad Hossain, 2016 - Present, Professional, Geological Society of America, Member
302. Azad Hossain, 2017 - present, Professional, Environmental Science: Current Research, Member of editorial board
303. Azad Hossain, 2021 - Present, Professional, Remote Sensing, Topic Editor and Review Board Member
304. Azad Hossain, 2023-Present, University (beyond BGE), CAS Committee of Inclusion and Engagement Excellence, Co-Chair
305. Azad Hossain, 2022-2023, University (beyond BGE), CAS DEI Committee, Committee Member
306. Azad Hossain, 2020-2021, University (beyond BGE), Faculty Grant, Committee Member
307. Azad Hossain, 2018, University (beyond BGE), IGT Lab Research Associate Search Committee, Committee Member
308. Azad Hossain, 2018-present, University (beyond BGE), IGTLab Advisory Committee, Committee Member
309. Azad Hossain, 2020-2021, 2023, University (beyond BGE), Undergraduate Academic Standard, Committee Member
310. Azad Hossain, 2017-2020, 2021-2023, University (beyond BGE), Undergraduate Curriculum, Committee Member
311. Azad Hossain, 2021, University (beyond BGE), IGTLab and Department of Continuing Education, Developed GIS Certificate Program
312. Azad Hossain, 2021, 2022, University (beyond BGE), Technology Symposium, Judge
313. Azad Hossain, 2019, University (beyond BGE), Workshop on Computational Geospatial Hydrology, Organizer
314. Azad Hossain, 2020, University (beyond BGE), ORSP Faculty Prep Grant, Reviewer
315. Azad Hossain, 2020, University (beyond BGE), URACE Grant, Reviewer
316. Azad Hossain, 2020-2023, University (beyond BGE), Environmental Sustainability and Climate Systems, Thrust Leader
317. Bramblett Jeremy, 2022-2023, Community, Creative Discovery Museum, New fossil exhibit reviewer
318. Bramblett Jeremy, 2023, Community, Soddy Elementary School 3rd Grade Classes, Presenter
319. Bramblett Jeremy, 2018-2020, University (beyond BGE), UTC Admissions Committee, member
320. Bramblett Jeremy, 2020-2023, University (beyond BGE), UTC General Education Committee, member
321. Bramblett Jeremy, 2023-2024, University (beyond BGE), UTC Learning Environment Committee, member
322. Katherine Kinnear, 2016-present, Community, Tennessee Wildlife Resources Agency, Class II Rehabilitator
323. Katherine Kinnear, 2021, Community, Red Bank Elementary, Guest Speaker
324. Katherine Kinnear, 2023-present, Community, Marshall Creek Wildlife Rehabilitation & Conservancy, Treasurer
325. Katherine Kinnear, , University (beyond BGE), Pre-Vet Student Club, Faculty Advisor

326. Katherine Kinnear, 2022-present, University (beyond BGE), MocUp First Generation Student Program, Faculty Mentor
327. Katherine Kinnear, 2021-present, University (beyond BGE), Honor Court, Member
328. Katherine Kinnear, 2021-2023, University (beyond BGE), SEARCH Awards, Reviewer
329. Hope Klug, 2018-2023, Community, GEAR UP Science Lab Day, University of Tennessee Chattanooga, Activity Leader
330. Hope Klug, 2020, Community, Hamilton County Department of Education, Hamilton County Professional Development for Teachers
331. Hope Klug, 2018, Community, High School Students in Research Mentoring, Mentor
332. Hope Klug, 2018-2023, Professional, Frontiers in Ecology & Evolution, Associate Editor
333. Hope Klug, 2013—2018, Professional, Proceedings of the Royal Society B, Associate Editor
334. Hope Klug, 2018—2021, Professional, Faculty of 1000, Behavioral Ecology Section Member
335. Hope Klug, 2018, Professional, Frontiers in Ecology & Evolution, Guest Associate Editor
336. Hope Klug, 2018-2023, Professional, Various journals in ecology and evolution, Reviewer
337. Hope Klug, 2018-2023 (at least once per year), Professional, National Science Foundation, Reviewer and Panel Member
338. Hope Klug, 2012-2020, Professional, Journal of Evolutionary Biology, Reviewing Editor
339. Hope Klug, 2016-2023, University (beyond BGE), Academic Advisor for Women in the Natural Sciences (WINS), Chair (through 2023) and Member
340. Hope Klug, 2018-2019, University (beyond BGE), Council of Academic Department Heads, Member
341. Hope Klug, 2016-2018, University (beyond BGE), Wheeler Odor Grant Board Member, Member
342. Hope Klug, 2019-2021, University (beyond BGE), Commission on the Status of Women, Chair of the Data Committee, Member and Chair of Data Committee
343. Margaret Kovach, 2021-2022, University (beyond BGE), Development Committee, Member
344. Margaret Kovach, 2018, University (beyond BGE), Faculty Grants Committee, Member
345. Margaret Kovach, 2019-2022, University (beyond BGE), Grade Appeals Committee, Member
346. Margaret Kovach, 2019-2022, University (beyond BGE), UTC SEARCH Award proposals, Reviewer
347. Ashley Manning-Berg, 2022, Community, Tellus Museum Fossil Mania, Outreach/presenter
348. Ashley Manning-Berg, 2022, Community, Thrasher Elementary Science Night, Outreach/presenter
349. Ashley Manning-Berg, 2021-Present, Community, Clifton Hills Elementary 2nd Grade Outreach, Presenter
350. Ashley Manning-Berg, 2021-Present, Community, Lookout Valley Elementary 2nd Grade Outreach, Presenter
351. Ashley Manning-Berg, 2022, Professional, National Association of Geoscience Teachers, Earth Educators Rendezvous Schedule Organizer
352. Ashley Manning-Berg, 2023, Professional, American Chemical Society, Grant Reviewer
353. Ashley Manning-Berg, 2020-2021, Professional, National Aeronautics and Space Administration Grant Panels, Grant Reviewer and Panelist
354. Ashley Manning-Berg, 2022, Professional, National Science Foundation, Grant Reviewer and Panelist

355. Ashley Manning-Berg, 2022-Present, Professional, The University of Cincinnati Early Career - Grad Student Mentorship Program, Mentor
356. Ashley Manning-Berg, 2020, Professional, The University of Cincinnati Dept. of Geology Seminar Panel, Being a Woman in Geoscience, Panelist
357. Ashley Manning-Berg, 2023, Professional, Earth Science Reviews, Reviewer
358. Ashley Manning-Berg, 2019; 2022, Professional, Geology, Reviewer
359. Ashley Manning-Berg, 2022;2023;2023, Professional, Minerals, Reviewer
360. Ashley Manning-Berg, 2022, Professional, Nature Geoscience, Reviewer
361. Ashley Manning-Berg, 2020, Professional, PALAIOS, Reviewer
362. Ashley Manning-Berg, 2019, Professional, Precambrian Research, Reviewer
363. Ashley Manning-Berg, 2020-Present, University (beyond BGE), University Committee - Faculty Rating of Administrators, Committee Member
364. Ashley Manning-Berg, 2022-Present, University (beyond BGE), College of Arts and Sciences Residential Learning Community Coordinator, Coordinator
365. Ashley Manning-Berg, 2021-2022, University (beyond BGE), Walker Center for Teaching and Learning, Panelist
366. Ashley Manning-Berg, 2020-Present, University (beyond BGE), UTC SEARCH Award proposals, Reviewer
367. Ashley Manning-Berg, 2023- Present, University (beyond BGE), Faculty Senate, Senator
368. Jonathan Mies, 2019-2022, Community, Road Scholars, Guest Speaker
369. Jonathan Mies, 2020-2021, University (beyond BGE), College of Arts and Sciences RTP Committee, Committee Chair
370. Jonathan Mies, 2019-2020, University (beyond BGE), Departmental RTP Committee, Committee Chair
371. Jonathan Mies, 2018-2019, University (beyond BGE), Search Committee for Assistant Professor in hydrology/aqueous geochemistry, Committee Chair
372. Jonathan Mies, 2018-2019, University (beyond BGE), Search Committee for Asst Professor in sedimentology and paleontology, Committee Chair
373. Jonathan Mies, 2022, University (beyond BGE), Search Committee for Geology Lecturer, Committee Chair
374. Jonathan Mies, 2019-2020, University (beyond BGE), Course Learning Evaluations Committee, Member
375. Jonathan Mies, 2020, University (beyond BGE), Search Committee for Geology Lecturer, Member
376. Jonathan Mies, 2020, University (beyond BGE), Undergraduate Admissions Committee, Member
377. Jonathan Mies, 2015-2021, University (beyond BGE), Wheeler Odor Research Advisory Board, Member
378. Monica Miles, 2023-Present, Community, Chattanooga Audubon Society, Board Member
379. Monica Miles, 2018-2020; 2022-Present, Community, Spring Wildflower Pilgrimage, Great Smoky Mountains National Park, Hike Leader
380. Monica Miles, 2022-Present, Community, Letters to Pre-Scientist, Pen-Pal
381. Monica Miles, 2022-Present, University (beyond BGE), Faculty Senate Course Learning Evaluations Committee, Committee Member
382. Sean Richards, 2013-2019, Community, North Chickamauga Creek Conservancy, Board Member
383. Sean Richards, 2019-present, Community, Hamilton County Regional Health Council Chair, Chair
384. Sean Richards, 2018-2020, Community, Tobacco Free Chattanooga, Chair
385. Sean Richards, 2018, Community, American Cancer Society, Science Ambassador

386. Sean Richards, 2017-2019, Community, Hamilton County Regional Health Council ViceChair, Vice Chair
387. Sean Richards, 2016-2018, Consulting, Miller&Martin PLLC, Expert consultant
388. Sean Richards, 2018-present, Professional, 17 Toxicology and Metabolomics journals, Ad-Hoc Reviewer
389. Sean Richards, 2006-present, Professional, Ecotoxicology, Associate Editor for Ecological Risk Assessment
390. Sean Richards, 2017-present, Professional, Advances in Clinical Toxicology, Editorial Board member
391. Sean Richards, 2018-present, Professional, Archives of Environmental Sciences and Environmental Toxicology, Editorial Board member
392. Sean Richards, 2017-present, Professional, Current Research: Environmental Science, Editorial Board member
393. Sean Richards, 2014-present, Professional, Global Journal of Environmental Science & Management, Editorial Board member
394. Sean Richards, 2018-present, Professional, Pharmacology, Toxicology and Pharmaceutics Open Access Open Journal, Editorial Board member
395. Sean Richards, 2004-present, Professional, US EPA Food Quality Protection Act (FQPA) Science Review Board, Review Board
396. Sean Richards, 2020-present, Professional, Developmental and Reproductive Toxicology (2020-present), Review Editor
397. Sean Richards, 2018, Professional, NSF – MRI and Rapid Response Research (RAPID), Reviewer
398. Joey Shaw, 2018, Community, Four Day Program for Escuela Verde Charter School, Milwaukee, WI, 10 students and three teachers over four days
399. Joey Shaw, 2019, Community, Four Day Program for Escuela Verde Charter School, Milwaukee, WI, 11 students and three teachers over four days
400. Joey Shaw, 2022, Community, Four Day Program for Escuela Verde Charter School, Milwaukee, WI, 12 students and three teachers over four days
401. Joey Shaw, 2018, Community, Normal Park Museum Magnet, 5 first grade classes on Biological Collections
402. Joey Shaw, 2019, Community, Normal Park Museum Magnet, 5 first grade classes on Biological Collections
403. Joey Shaw, 2022, Community, Normal Park Museum Magnet, 5 first grade classes on Biological Collections
404. Joey Shaw, 2023, Community, Normal Park Museum Magnet, 5 first grade classes on Biological Collections
405. Joey Shaw, 2023, Community, Two West Knoxville HS Class Fieldtrips to GSMNP, 50 student program on jobs in conservation
406. Joey Shaw, 2022, Community, Two West Knoxville HS Class Fieldtrips to GSMNP, 51 student program on jobs in conservation
407. Joey Shaw, 2019, Community, Two West Knoxville HS Class Fieldtrips to GSMNP, 52 student program on jobs in conservation
408. Joey Shaw, 2018, Community, Two West Knoxville HS Class Fieldtrips to GSMNP, 53 student program on jobs in conservation
409. Joey Shaw, 2021-2023, Community, Reflection Riding Arboretum and Nature Preserve, Board Member
410. Joey Shaw, 2015-present, Community, Highlands Biological Station, Board Member (Scientific Advisors)
411. Joey Shaw, 2018, Community, Friends of Roan Mountain, Digitizing Tennessee's one million herbarium specimens

412. Joey Shaw, 2018, Community, Spring Wildflower Pilgrimage, Great Smoky Mountains National Park, Director and Organizer
413. Joey Shaw, 2019, Community, Spring Wildflower Pilgrimage, Great Smoky Mountains National Park, Director and Organizer
414. Joey Shaw, 2020, Community, Spring Wildflower Pilgrimage, Great Smoky Mountains National Park, Director and Organizer
415. Joey Shaw, 2021, Community, Spring Wildflower Pilgrimage, Great Smoky Mountains National Park, Director and Organizer
416. Joey Shaw, 2022, Community, Spring Wildflower Pilgrimage, Great Smoky Mountains National Park, Director and Organizer
417. Joey Shaw, 2023, Community, Spring Wildflower Pilgrimage, Great Smoky Mountains National Park, Director and Organizer
418. Joey Shaw, 2018, Community, WUTC Interview, Interview Spring Wildflower Pilgrimage
419. Joey Shaw, 2018, Community, WUTC interview, UTC Herbarium NSF Funding Specimen Digitization
420. Joey Shaw, 2023, Community, Interview fort Tennessee Aquarium on Spring Wildflower Pilgrimage, Interviewee
421. Joey Shaw, 2021, Professional, National Science Foundation, Interview Discovery Files
422. Joey Shaw, 2009-present, Professional, Tennessee Rare Plant Advisory Committee (Appt by State of TN), Member
423. Joey Shaw, 2017-2019, Professional, Association of Southeastern Biologists, Past President
424. Joey Shaw, 2018-2019, Professional, Tennessee Academy of Sciences, President and Secretary Botany Section
425. Joey Shaw, , Professional, Reviewer for journals, Reviewer
426. John Tucker, 2018-2023, Community, Chattanooga-Hamilton County Air Pollution Control Bureau Board, Vice-Chair (since 2021), Member
427. John Tucker, 2022, Professional, Agronomy, Reviewer
428. John Tucker, 2019, Professional, Forests, Reviewer
429. John Tucker, 2021, Professional, Forests, Reviewer
430. John Tucker, 2022, Professional, Intl Journal of Envntl Research & Public Health, Reviewer
431. John Tucker, 2021, Professional, Sustainability, Reviewer
432. John Tucker, 2023, Professional, Water, Reviewer
433. John Tucker, 2019, University (beyond BGE), Assistant Dean Search Committee Arts & Sciences, Chair
434. John Tucker, 2019-2020, University (beyond BGE), Chemistry & Physics Department Head Search Committee, Chair
435. John Tucker, 2018-2020, University (beyond BGE), Executive Committee Arts & Sciences, Chair
436. John Tucker, 2018-2019, University (beyond BGE), Mathematics Department Head Search Committee, Chair
437. John Tucker, 2018-2020, University (beyond BGE), Tenure & Promotion Committee Arts & Sciences, Chair
438. John Tucker, 2018-2023, University (beyond BGE), Wheeler Odor Board Arts & Sciences, Chair
439. John Tucker, 2021-2023, University (beyond BGE), Envntl Studies Advisory Commmittee, Member
440. John Tucker, 2019, University (beyond BGE), Non-Tenure Track Faculty Task Force UTC, Member

- 441. John Tucker, 2022-2023, University (beyond BGE), Promotion Committee Political Science and Public Service Dept, Member
- 442. Thomas Wilson, 2018-2024, Community, Animal Use Committee CNC, member
- 443. Thomas Wilson, 2010-2024, Community, Turtle Survival Alliance, member
- 444. Thomas Wilson, 1999-2024, Professional, Partners in Amphibian and Reptile Conservation, member
- 445. Thomas Wilson, 2018-2024, Professional, ASB Poster and Presentation Awards Committee, member and reviewer
- 446. Thomas Wilson, 1992-2024, Professional, ASIH, member and reviewer
- 447. Thomas Wilson, 1992-2024, Professional, SSAR, member and reviewer
- 448. Thomas Wilson, 2010-2024, Professional, The Wildlife Society, member and reviewer
- 449. Thomas Wilson, 2013-2024, Professional, Turtle Survival Alliance, Species Survival Agreement
- 450. Thomas Wilson, 2020-2024, University (beyond BGE), UTC Student Chapter of The Wildlife Society, Advisor
- 451. Thomas Wilson, 2022-2023, University (beyond BGE), UTC Graduate Council, Chair
- 452. Thomas Wilson, 2022-2023, University (beyond BGE), UTC Graduate Council Appeals Committee, Chair
- 453. Thomas Wilson, 2020-2021, University (beyond BGE), UTC Graduate Council- Best Practices Committee, Chair
- 454. Thomas Wilson, 2011-2024, University (beyond BGE), Wildlife-Zoology Club, Founder and Advisor
- 455. Thomas Wilson, 2019, University (beyond BGE), CAS Reappointment, Tenure and Promotion Committee, member
- 456. Thomas Wilson, 2023-2024, University (beyond BGE), UTC Graduate Council, member
- 457. Thomas Wilson, 2018-2021, University (beyond BGE), UTC Graduate Council- Appeals, member
- 458. Thomas Wilson, 2018-2024, University (beyond BGE), UTC Graduate Council- Curriculum Committee, Member
- 459. Thomas Wilson, 2019, University (beyond BGE), CAS Assistant Dean Search Committee, member
- 460. Thomas Wilson, 2017-2024, University (beyond BGE), IACUC, Vice-Chair (since 2021), Member
- 461. Thomas Wilson, 2021-2022, University (beyond BGE), UTC Graduate Council, Vice-Chair (since 2021), Member

Appendix 4-L Undergraduate Student Mentorship

1. Gavin Hasty, Level: Undergraduate, Mentor: Amy Brock-Hon, 2018, Testing of a passive seismic system
2. Japorsche Pettaway, Level: Undergraduate, Mentor: Amy Brock-Hon, 2018, Data collection for soils of Spirit Mountain, NV
3. Kenneth Bonnette, Level: Undergraduate, Mentor: Amy Brock-Hon, 2018, Preparation of samples for barite analysis
4. Caleb Mathias, Level: Undergraduate, Mentor: Amy Brock-Hon, 2018, Building a Smart Chattanooga: Connecting our Community to its foundation
5. Katie Spivey, Level: Undergraduate, Mentor: Amy Brock-Hon, 2018, Building a Smart Chattanooga: Connecting our Community to its foundation
6. Elizabeth McAllister, Level: Undergraduate, Mentor: Amy Brock-Hon, 2018, Geology of Chattanooga and its influence on historical events
7. Hayley Beitel, Level: Undergraduate, Mentor: Azad Hossain, 2018, DHON Thesis (Committee Member): GIS Analysis of Barrovian Index Minerals and Textures in the Metamorphic Zones of the Tennessee Blue Ridge
8. Austen York, Level: Undergraduate, Mentor: Azad Hossain, 2018, Senior Seminar Research
9. Austin Riggins, Level: Undergraduate, Mentor: Azad Hossain, 2018, Senior Seminar Research
10. Stefan Dohse, Level: Undergraduate, Mentor: Azad Hossain, 2018, Geology Seminar Research
11. Ryan Welborn, Level: Undergraduate, Mentor: Azad Hossain, 2018, Geology Seminar Research
12. Jacob Burleson, Level: Undergraduate, Mentor: Azad Hossain, 2018, Geology Seminar Research
13. Erin Catanach, Level: Undergraduate, Mentor: Azad Hossain, 2018, Geology Seminar Research
14. Olivia Barker, Level: undergraduate, Mentor: Callie Adams, 2018, Internship Supervisor
15. Luke Householder, Level: undergraduate, Mentor: Callie Adams, 2018, Internship Supervisor
16. Madison Himes, Level: undergraduate, Mentor: Callie Adams, 2018, Individual Studies
17. Megon Stepaniuk, Level: Undergraduate, Mentor: David Aborn, 2018, Internship advisor: Animal husbandry intern at TN Aquarium
18. Emily Lindsay, Level: Undergraduate, Mentor: David Giles, 2018, Honors Thesis: Fatty Acid Mediated Chemotaxis in *Vibrio cholerae*
19. Reed Boeger, Level: Undergraduate, Mentor: David Giles, 2018, Research: Bioreactor Studies with *Vibrio cholerae*
20. Joshua Herndon, Level: Undergraduate, Mentor: David Giles, 2018, Honors Thesis: Fatty Acid Responses in *Escherichia coli* and *Acinetobacter baumannii*
21. Colin Smith, Level: Undergraduate, Mentor: David Giles, 2018, Individual Studies: Methicillin Resistant *Staphylococcus aureus* (MRSA) in Healthcare settings
22. Rachel Peters, Level: Undergraduate, Mentor: David Giles, 2018, Individual Studies: Fatty Acid Responses in *Escherichia coli* and *Klebsiella pneumoniae*
23. Jessica Ammon, Level: Undergraduate, Mentor: David Giles, 2018, Honors Thesis: Methicillin Resistant *Staphylococcus aureus* (MRSA) in Healthcare settings
24. Erin Norton, Level: Undergraduate, Mentor: David Giles, 2018, Individual Studies: Cellular Biology Preparation and Microbiology Assistant on Several Projects
25. Katelyn West, Level: Undergraduate, Mentor: David Giles, 2018, Individual Studies: Bioinformatics of Fatty Acid Handling Machinery in *Gamma*proteobacteria
26. Rudolfo Camacho, Level: Undergraduate, Mentor: David Giles, 2018, Individual Studies: Microbiology Assistant on Several Projects
27. Courtney Hattaway, Level: Undergraduate, Mentor: David Giles, 2018, Internship Project with Veterinary Organization
28. Hao Brooks, Level: Undergraduate, Mentor: DeAnna Beasley, 2018, Changes in ant biodiversity across an urban gradient
29. Victoria Noyes, Level: Undergraduate, Mentor: Henry Spratt, 2018, Honor Thesis

30. Katie Noonan, Level: Undergraduate, Mentor: Henry Spratt, 2018, Survival of *Staphylococcus aureus* on medical devices
31. Ariel Seiber, Level: Undergraduate, Mentor: Henry Spratt, 2018, Bacterial contamination in a Pediatric Intensive Care Unit in a local hospital
32. Caroline Luiken, Level: Undergraduate, Mentor: Henry Spratt, 2018, Bacterial contamination in a Pediatric Intensive Care Unit in a local hospital
33. Mariah Stoermer, Level: Undergraduate, Mentor: Henry Spratt, 2018, Bacterial contamination in a Pediatric Intensive Care Unit in a local hospital
34. Christine Macias, Level: Undergraduate, Mentor: Henry Spratt, 2018, Bacterial contamination in a newly constructed Pediatric Out Patient Clinic associated with a local hospital
35. Lindsey Brunton, Level: Undergraduate, Mentor: Henry Spratt, 2018, Bacterial contamination in a newly constructed Pediatric Out Patient Clinic associated with a local hospital
36. Gary Price, Level: Undergraduate, Mentor: Henry Spratt, 2018, Bacterial contamination in a newly constructed Pediatric Out Patient Clinic associated with a local hospital
37. Kevin Gentner, Level: Undergraduate, Mentor: Henry Spratt, 2018, Bacterial contamination in a newly constructed Pediatric Out Patient Clinic associated with a local hospital
38. William Cofer, Level: Undergraduate, Mentor: Henry Spratt, 2018, Bacterial contamination in a newly constructed Pediatric Out Patient Clinic associated with a local hospital
39. Daniel Rajai-Firoozabadi, Level: Undergraduate, Mentor: Henry Spratt, 2018, The presence of bacterial biofilms inside pipes associated with irrigation systems for chicken houses
40. Daniel See, Level: Undergraduate, Mentor: Henry Spratt, 2018, Bacterial contamination of surfaces in a Neonatal Intensive Care Unit in a local hospital
41. Trent Deason, Level: Undergraduate, Mentor: Hill Craddock, 2018, DHON Thesis: Conservation and collection of *Castanea dentata* germplasm in the South
42. Kevin Gentner, Level: Undergraduate, Mentor: Hill Craddock, 2018, DHON Thesis: Evaluation of blight resistance in chestnut f2 half-sibling and full-sibling families via small stem assay
43. Kirsten Hein, Level: Undergraduate, Mentor: Hill Craddock, 2018, DHON Thesis: Implementing early screening methods to detect resistance to *Phytophthora cinnamomi* in backcross Chinese-American Chestnut hybrids
44. Allison Clower, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, Rarity research seed collections
45. Arden Craft, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, Rarity research seed collections
46. Braley Gentry, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, Rarity research seed collections
47. Hannah Durden, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, Rarity research germination trials
48. Hannah Matthews, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, Rarity research network analysis data curation
49. Holly Seiler, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, Rarity research network analysis data curation
50. Jiten Dave, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, Rarity research germination trials
51. Kirsten Hein, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, DHON Committee: Implementing early screening methods to detect resistance to *Phytophthora cinnamomi* in backcross Chinese-American Chestnut hybrids
52. Megon Stepaniuk, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, Rarity research growth chamber experiments
53. Mikayla Holmes, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, Rarity research seed collections

54. Sharon Hawkins, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, Rarity research germination trials
55. Sophia Calles, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, Rarity research common garden experiments
56. Thomas Wiegand, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, Rarity research seed collections
57. Whitney Glaze, Level: Undergraduate, Mentor: Jennifer Boyd, 2018, Rarity research network analysis data curation
58. Alexis Bond, Level: Undergraduate, Mentor: Joey Shaw, 2018, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
59. Andi Kur, Level: Undergraduate, Mentor: Joey Shaw, 2018, UHON Thesis: Botanical illustration to improve learning and the success of correct species determination.
60. Briana Bivens, Level: Undergraduate, Mentor: Joey Shaw, 2018, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
61. Hannah Nelms, Level: Undergraduate, Mentor: Joey Shaw, 2018, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
62. Jacqueline Ruggiero, Level: Undergraduate, Mentor: Joey Shaw, 2018, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
63. Kennedy Boyle, Level: Undergraduate, Mentor: Joey Shaw, 2018, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
64. Olivia Brown, Level: Undergraduate, Mentor: Joey Shaw, 2018, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
65. Craig Martin, Level: Undergraduate, Mentor: John Tucker, 2018, Tennessee Interbasin Water Transfer Act Analysis
66. Molly Burdine, Level: Undergraduate, Mentor: Sean Richards, 2018, UHON: Statins affect the reproduction and multi-generational life-cycle of *Daphnia magna*.
67. Chloe Dente, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2018, Insect curation
68. Anna Schilling, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2018, Insect collecting
69. Colby Mulderig, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2018, Insect curation
70. Louis Brill, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2018, Insect curation
71. Will Cofer, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2018, Insect photography
72. Mallory Barbier, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2018, DHON: Edge Effects and Diversity of Understory and Canopy Tropical Cloud Forest Beetles
73. Kyle Baker, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2018, Brock Scholar: Insect photography
74. Allyson Wills, Level: Undergraduate, Mentor: Thomas Wilson, 2018, Research
75. Breanna McDevitt, Level: Undergraduate, Mentor: Thomas Wilson, 2018, Research
76. Caroline Finke, Level: Undergraduate, Mentor: Tim Gaudin, 2018, Description of Pleistocene/Holocene vertebrate faunas from Lookout Mtn., TN.
77. Joseph Broome, Level: Undergraduate, Mentor: Tim Gaudin, 2018, First record of extinct mylodontid ground sloth (*Glossotherium tropicorum*) from tar pits of Trinidad
78. Joseph Broome, Level: Undergraduate, Mentor: Tim Gaudin, 2018, Curatorial Assistant in Mammal collection of UTC Natural History Museum
79. Kayla Faulkner, Level: Undergraduate, Mentor: Tim Gaudin, 2018, Curatorial Assistant in Mammal collection of UTC Natural History Museum
80. Lucy Brown, Level: Undergraduate, Mentor: Tim Gaudin, 2018, Curatorial Assistant in Mammal collection of UTC Natural History Museum
81. Ashley Forbeck, Level: Undergraduate, Mentor: Tim Gaudin, 2018, Curatorial Assistant in Mammal collection of UTC Natural History Museum
82. Aubrey Gardin, Level: Undergraduate, Mentor: Tim Gaudin, 2018, Curatorial Assistant in Mammal collection of UTC Natural History Museum

83. Destiny Mix, Level: Undergraduate, Mentor: Tim Gaudin, 2018, Curatorial Assistant in Mammal collection of UTC Natural History Museum
84. Michael Payne, Level: Undergraduate, Mentor: Tim Gaudin, 2018, Curatorial Assistant in Mammal collection of UTC Natural History Museum
85. Holly Odell, Level: Undergraduate, Mentor: Thomas Wilson, 2018, Independent Study- Team Salamander
86. Cullen Harris, Level: Undergraduate, Mentor: Thomas Wilson, 2018, The Wildlife Society
87. Michael Ashcraft, Level: Undergraduate, Mentor: Thomas Wilson, 2018, Independent Study- Team Salamander
88. Cullen Harris, Level: Undergraduate, Mentor: Thomas Wilson, 2018, Independent Study- Team Salamander
89. Cullen Harris, Level: Undergraduate, Mentor: Thomas Wilson, 2018, Museum Curation
90. Cullen Harris, Level: Undergraduate, Mentor: Thomas Wilson, 2018, Turtle Survival Alliance
91. Cullen Harris, Level: Undergraduate, Mentor: Thomas Wilson, 2018, Snake Fungal Disease Project
92. Cullen Harris, Level: Undergraduate, Mentor: Thomas Wilson, 2018, North American Amphibian Monitoring Project
93. John Brazelton, Level: Undergraduate, Mentor: Thomas Wilson, 2018, Independent Study- Team Salamander
94. Richard Schwartz, Level: Undergraduate, Mentor: Thomas Wilson, 2018, DHON- North American Amphibian Monitoring Project
95. McKenzie Jaynes, Level: Undergraduate, Mentor: Thomas Wilson, 2018, Independent Study- Team Salamander
96. Katie Spivey, Level: Undergraduate, Mentor: Amy Brock-Hon, 2019, Mineral specimen identification and organization
97. Sean Jones, Level: Undergraduate, Mentor: Amy Brock-Hon, 2019, Clast count analysis of materials from Mesquite, NV
98. Timothy Perkins, Level: Undergraduate, Mentor: Amy Brock-Hon, 2019, Design and construction of a dust trap
99. William Adair, Level: Undergraduate, Mentor: Azad Hossain, 2019, GERS Laboratory Research
100. Jacob Burleson, Level: Undergraduate, Mentor: Azad Hossain, 2019, Independent Research
101. Jacob Burleson, Level: Undergraduate, Mentor: Azad Hossain, 2019, Senior Seminar Research
102. Stefan Dohse, Level: Undergraduate, Mentor: Azad Hossain, 2019, Senior Seminar Research
103. Ryan Wellborn, Level: Undergraduate, Mentor: Azad Hossain, 2019, Senior Seminar Research
104. Jacob Burleson, Level: Undergraduate, Mentor: Azad Hossain, 2019, GERS Laboratory Research
105. John Ali, Level: Undergraduate, Mentor: Azad Hossain, 2019, NSF REU (iCompBio)
106. Caleb Mathias, Level: Undergraduate, Mentor: Azad Hossain, 2019, GERS Laboratory Research
107. Caleb Mathias, Level: Undergraduate, Mentor: Azad Hossain, 2019, Independent Study
108. Jacob Burleson, Level: Undergraduate, Mentor: Azad Hossain, 2019, GERS Laboratory Research
109. Hannah Black, Level: undergraduate, Mentor: Callie Adams, 2019, Internship Supervisor
110. Abigail Bonnette-Stainbrook, Level: undergraduate, Mentor: Callie Adams, 2019, Internship Supervisor
111. Carlie Ballard, Level: Undergraduate, Mentor: David Aborn, 2019, Internship advisor: Animal care and husbandry intern at the Memphis Zoo

112. Lauren Lyons, Level: Undergraduate, Mentor: David Aborn, 2019, Internship advisor: Mosquito surveillance technician with TVA
113. Megan Roy, Level: Undergraduate, Mentor: David Giles, 2019, Individual Studies: Methicillin Resistant Staphylococcus aureus (MRSA) in Healthcare settings
114. Isabel Gray, Level: Undergraduate, Mentor: David Giles, 2019, Honors Thesis: Fatty Acid Mediated Biofilm Formation in *Vibrio cholerae*
115. Carina Houck, Level: Undergraduate, Mentor: David Giles, 2019, Individual Studies: Fatty Acid and Piscidin Dynamics in *Vibrio cholerae*
116. Eric Siv, Level: Undergraduate, Mentor: David Giles, 2019, Individual Studies: Allee Effects in *Vibrio cholerae*
117. Rachel Hofer, Level: Undergraduate, Mentor: David Giles, 2019, Honors Thesis: Fatty Acid Responses in *Escherichia coli* and *Aeromonas salmonicida*
118. Matthew Harris, Level: Undergraduate, Mentor: David Giles, 2019, Individual Studies: Microbiology Assistant on Several Projects
119. Ayanna Esdaile, Level: Undergraduate, Mentor: David Giles, 2019, Research: Fatty Acid Mediated Growth and Biofilm Formation in *Vibrio alginolyticus* and *Vibrio fischerii*
120. Kwame Forbes, Level: Undergraduate, Mentor: David Giles, 2019, NSF REU: Bioinformatics of Fatty Acid Handling Machinery in Gammaproteobacteria
121. Tim Simmons, Level: Undergraduate, Mentor: David Giles, 2019, Individual Studies: Fatty Acid Responses in *Escherichia coli* and *Vibrio* species
122. Itzel Hernandez Guzman, Level: Undergraduate, Mentor: DeAnna Beasley, 2019, Oil preference in ants and arthropod diversity in urban environments
123. Tiffany Harvey, Level: Undergraduate, Mentor: Fernando Alda, 2019, Honor Thesis
124. David Shepherd, Level: Undergraduate, Mentor: Fernando Alda, 2019, Honor Thesis
125. Aaren Isabel, Level: Undergraduate, Mentor: Fernando Alda, 2019,
126. Kyle Baker, Level: Undergraduate, Mentor: Fernando Alda, 2019, Honor Thesis
127. Autumn Miller, Level: Undergraduate, Mentor: Francesca Leasi, 2019, Individual Studies: Thalassic rotifers from the US
128. Braxton Reker, Level: Undergraduate, Mentor: Francesca Leasi, 2019, Individual Studies: Rotifer distribution in the Southeast
129. Svava Sukla, Level: Undergraduate, Mentor: Francesca Leasi, 2019, Individual Studies: Digitization of invertebrates at UTC slide collection
130. Miles Wilson, Level: Undergraduate, Mentor: Francesca Leasi, 2019, Individual Studies: Rotifer distribution in the Southeast
131. DeMonica Johnson, Level: Undergraduate, Mentor: Francesca Leasi, 2019, Individual Studies: Rotifer distribution in the Southeast
132. Krina Patel, Level: Undergraduate, Mentor: Henry Spratt, 2019, Work in the Microbiology Preparation Lab
133. Weston Chambers, Level: Undergraduate, Mentor: Henry Spratt, 2019, Bacterial contamination of surfaces in a Neonatal Intensive Care Unit in a local hospital
134. Chloe Cross, Level: Undergraduate, Mentor: Henry Spratt, 2019, Honors Thesis
135. Ariel Seiber, Level: Undergraduate, Mentor: Henry Spratt, 2019, Bacterial contamination in a Pediatric Intensive Care Unit in a local hospital
136. Caroline Luiken, Level: Undergraduate, Mentor: Henry Spratt, 2019, Study looking at the growth of bacterial biofilms on the surfaces of breast implants used in breast augmentation surgery
137. Mariah Stoermer, Level: Undergraduate, Mentor: Henry Spratt, 2019, Study looking at the growth of bacterial biofilms on the surfaces of breast implants used in breast augmentation surgery
138. Lindsey Brunton, Level: Undergraduate, Mentor: Henry Spratt, 2019, Bacterial contamination in a newly constructed Pediatric Out Patient Clinic associated with a local hospital

139. Daniel See, Level: Undergraduate, Mentor: Henry Spratt, 2019, Bacterial contamination of surfaces in a Neonatal Intensive Care Unit in a local hospital
140. Allison Clower, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, Rarity research growth chamber experiments
141. Braley Gentry, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, Visualizing connectivity of ecological and evolutionary concepts—An exploration of research on plant species rarity
142. Chanlie Baker, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, Rarity research growth chamber experiments
143. Erin McCoy, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, Rarity research seed collections
144. Garrett Allen, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, DHON Advisor: Exploring the potential for rare and common *Borodinia* species to acclimate to change
145. Hannah McClaren, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, Rarity research growth chamber experiments
146. Jessyca Sterling, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, Rarity research growth chamber experiments
147. Laurel Jobe, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, DHON Committee: Ecological health of an inland water body on San Salvador Island, Bahamas.
148. Lindsay Hagar, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, Rarity research growth chamber experiments
149. Lindsey Long, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, Rarity research growth chamber experiments
150. Madeline Brown, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, Rarity research growth chamber experiments
151. McKenzie Whitten, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, Rarity research growth chamber experiments
152. Sophia Calles, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, Rarity research common garden experiments
153. Taylor Canova, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, Rarity research growth chamber experiments
154. Terri Slight, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, Rarity research growth chamber experiments
155. Thomas Wiegand, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, DHON Advisor: Visualizing connectivity of ecological and evolutionary concepts—An exploration of research on plant species rarity
156. Trent Deason, Level: Undergraduate, Mentor: Jennifer Boyd, 2019, DHON Committee: Conservation and collection of *Castanea dentata* germplasm in the South
157. Amy Lippard, Level: Undergraduate, Mentor: Joey Shaw, 2019, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
158. Brian Pierce, Level: Undergraduate, Mentor: Joey Shaw, 2019, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
159. Diana Sevier, Level: Undergraduate, Mentor: Joey Shaw, 2019, UHON Thesis: Ethnobotanical study of human uses of pteridophytes in Tennessee
160. Hannah Matthews, Level: Undergraduate, Mentor: Joey Shaw, 2019, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
161. Joshua Harrison, Level: Undergraduate, Mentor: Joey Shaw, 2019, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
162. Julian Kirby, Level: Undergraduate, Mentor: Joey Shaw, 2019, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair

163. Madalyn Brown, Level: Undergraduate, Mentor: Joey Shaw, 2019, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
164. Matthew Harris, Level: Undergraduate, Mentor: Joey Shaw, 2019, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
165. Milan Makawana, Level: Undergraduate, Mentor: Joey Shaw, 2019, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
166. Parth Desai, Level: Undergraduate, Mentor: Joey Shaw, 2019, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
167. Prit Desai, Level: Undergraduate, Mentor: Joey Shaw, 2019, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
168. Randy Allen, Level: Undergraduate, Mentor: Joey Shaw, 2019, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
169. Stephanie Clayton, Level: Undergraduate, Mentor: Joey Shaw, 2019, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
170. Tami Truong, Level: Undergraduate, Mentor: Joey Shaw, 2019, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
171. Emily Stumbo, Level: Undergraduate, Mentor: John Tucker, 2019, Tennessee Interbasin Water Transfer Act Analysis
172. Kenneth Bonnette, Level: Undergraduate, Mentor: Jonathan Mies, 2019, Evolution of the Rocktown landscape, Pigeon Mountain
173. James Hays, Level: Undergraduate, Mentor: Jonathan Mies, 2019, Peculiar microseisms of hurricanes Matthew and Florence
174. Cheyenne Cummings, Level: Undergraduate, Mentor: Loren Hayes, 2019, UTC ASPIRE: research assistant
175. Ashley Carpenter, Level: Undergraduate, Mentor: Loren Hayes, 2019, Research assistant
176. Olivia Morrison, Level: Undergraduate, Mentor: Margaret Kovach, 2019, The Effect of E-cigarette Exposure on Gene Expression and Cell Viability in Lung Cells
177. Elizabeth Plunk, Level: undergraduate, Mentor: Sean Richards, 2019, Neuro-toxic and reproductive effects of BPA
178. Carter Jones, Level: undergraduate, Mentor: Sean Richards, 2019, Placental collection and analysis for metal analysis
179. Hannah Hightower, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2019, Description of new Xanthopygina species
180. Sydney Wilson, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2019, Insect curation
181. Brandon Hataway, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2019, Insect curation
182. Katie Mason, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2019, Insect curation
183. Adam Warren, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2019, Insect curation
184. Julian Kirby, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2019, Insect databasing
185. Megan Roy, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2019, New records of beetles in TN
186. Allyson Wills, Level: Undergraduate, Mentor: Thomas Wilson, 2019, Research
187. Breanna McDevitt, Level: Undergraduate, Mentor: Thomas Wilson, 2019, Independent Study
188. Breanna McDevitt, Level: Undergraduate, Mentor: Thomas Wilson, 2019, Research
189. Joseph Broome, Level: Undergraduate, Mentor: Tim Gaudin, 2019, First record of extinct mylodontid ground sloth (*Glossotherium tropicorum*) from tar pits of Trinidad

190. Kendall Graham, Level: Undergraduate, Mentor: Tim Gaudin, 2019, Description of Pleistocene/Holocene vertebrate faunas from Lookout Mtn., TN.
191. Thomas Scaife, Level: Undergraduate, Mentor: Tim Gaudin, 2019, Description of the skull of the early Miocene ground sloth *Schismotherium*.
192. Ashley Carpenter, Level: Undergraduate, Mentor: Tim Gaudin, 2019, Curatorial Assistant in Mammal collection of UTC Natural History Museum
193. Adam Chiolo, Level: Undergraduate, Mentor: Tim Gaudin, 2019, Curatorial Assistant in Mammal collection of UTC Natural History Museum
194. Jasmine Rafique, Level: Undergraduate, Mentor: Tim Gaudin, 2019, Curatorial Assistant in Mammal collection of UTC Natural History Museum
195. Haley Head, Level: Undergraduate, Mentor: Tim Gaudin, 2019, Curatorial Assistant in Mammal collection of UTC Natural History Museum
196. Aayushi Shah, Level: Undergraduate, Mentor: Tim Gaudin, 2019, Curatorial Assistant in Mammal collection of UTC Natural History Museum
197. Richard Schwartz, Level: Undergraduate, Mentor: Thomas Wilson, 2019, DHON- North American Amphibian Monitoring Project
198. Michael Darity, Level: undergraduate, Mentor: Bradley Reynolds, 2019, Internship Supervisor
199. Alex Lennon, Level: undergraduate, Mentor: Bradley Reynolds, 2019, Internship Supervisor
200. Meagan Wetherholt, Level: undergraduate, Mentor: Bradley Reynolds, 2019, Internship Supervisor
201. Ashley Bosecker, Level: undergraduate, Mentor: Bradley Reynolds, 2019, Independent Study
202. Cidney Coppock, Level: undergraduate, Mentor: Bradley Reynolds, 2019, Independent Study
203. Sarah Magley, Level: undergraduate, Mentor: Bradley Reynolds, 2019, Independent Study
204. William Pickett, Level: undergraduate, Mentor: Bradley Reynolds, 2019, Independent Study
205. William Stuart, Level: undergraduate, Mentor: Bradley Reynolds, 2019, Independent Study
206. McKenzie Whitten, Level: undergraduate, Mentor: Bradley Reynolds, 2019, Independent Study
207. Alice Gleadhill, Level: undergraduate, Mentor: Bradley Reynolds, 2019, Internship Supervisor
208. Logan Day, Level: undergraduate, Mentor: Bradley Reynolds, 2019, Independent Study
209. Savannagrace Beck, Level: undergraduate, Mentor: Sarah Farnsley, 2019, Individual Studies
210. Madison Roberts, Level: undergraduate, Mentor: Sarah Farnsley, 2019, Individual Studies
211. Kori Collins, Level: undergraduate, Mentor: Sarah Farnsley, 2019, Individual Studies
212. Colton Morton, Level: undergraduate, Mentor: Sarah Farnsley, 2019, Individual Studies
213. Nathan Napier, Level: undergraduate, Mentor: Sarah Farnsley, 2019, Individual Studies
214. Alyssa Howard, Level: Undergraduate, Mentor: Amy Brock-Hon, 2020, Review and study on relationship between biocryptogamic crust and petrocalcic materials
215. Lauren Gossett, Level: Undergraduate, Mentor: Amy Brock-Hon, 2020, XRD analysis of materials from Nevada
216. Camille Smith, Level: Undergraduate, Mentor: Amy Brock-Hon, 2020, SEM analysis of playette materials from Nevada
217. William Stuart, Level: Undergraduate, Mentor: Azad Hossain, 2020, Independent Study

218. Andrew Delaney, Level: Undergraduate, Mentor: Azad Hossain, 2020, Independent Study
219. Caleb Mathias, Level: Undergraduate, Mentor: Azad Hossain, 2020, GERS Laboratory Research
220. Jacob Burleson, Level: Undergraduate, Mentor: Azad Hossain, 2020, GERS Laboratory Research
221. Serena Hollis, Level: Undergraduate, Mentor: Azad Hossain, 2020, NSF REU (iCompBio)
222. Mariah Ivey, Level: Undergraduate, Mentor: Azad Hossain, 2020, Independent Study
223. Shannon Tattitch, Level: Undergraduate, Mentor: Azad Hossain, 2020, Independent Study
224. Abbie Faxon, Level: Undergraduate, Mentor: Azad Hossain, 2020, Geology Seminar
225. Braxton Anzalone, Level: Undergraduate, Mentor: Azad Hossain, 2020, GERS Laboratory Research
226. Megan Roy, Level: Undergraduate, Mentor: David Giles, 2020, Individual Studies: Methicillin Resistant *Staphylococcus aureus* (MRSA) in Healthcare settings
227. Carina Houck, Level: Undergraduate, Mentor: David Giles, 2020, Individual Studies: Fatty Acid and Piscidin Dynamics in *Vibrio cholerae*
228. Isabel Gray, Level: Undergraduate, Mentor: David Giles, 2020, Honors Thesis: Fatty Acid Mediated Biofilm Formation in *Vibrio cholerae*
229. Elizabeth Allen, Level: Undergraduate, Mentor: David Giles, 2020, Honors Thesis: Fatty Acid and Piscidin Dynamics in *Vibrio cholerae*
230. David Smith, Level: Undergraduate, Mentor: David Giles, 2020, Honors Thesis: Fatty Acid Responses in *Vibrio alginolyticus* and *Vibrio fischeri*
231. Allen Lin, Level: Undergraduate, Mentor: David Giles, 2020, Honors Thesis: Fatty Acid Responses in *Aeromonas salmonicida*
232. Olivia Chester, Level: Undergraduate, Mentor: David Giles, 2020, Research: Fatty Acid and Piscidin Dynamics in *Vibrio cholerae*
233. Tim Simmons, Level: Undergraduate, Mentor: David Giles, 2020, Research: Fatty Acid Responses in *Escherichia coli* and *Vibrio* species
234. Morgan Lowe, Level: Undergraduate, Mentor: Fernando Alda, 2020, Individual Studies
235. Juliet Wimberly, Level: Undergraduate, Mentor: Fernando Alda, 2020, Individual Studies
236. Taya de Blonk, Level: Undergraduate, Mentor: Fernando Alda, 2020, Individual Studies
237. Grace Carlino, Level: Undergraduate, Mentor: Francesca Leasi, 2020, Individual Studies: Molecular assessment of meiofauna in Hamilton County
238. Veronica Hafner, Level: Undergraduate, Mentor: Francesca Leasi, 2020, Individual Studies: Literature search for biogeography of meiofauna
239. Caleb Hendren, Level: Undergraduate, Mentor: Francesca Leasi, 2020, Individual Studies: Molecular assessment of meiofauna in Hamilton County
240. Chloe Lemoine, Level: Undergraduate, Mentor: Francesca Leasi, 2020, Individual Studies: Literature search for biogeography of meiofauna
241. Ethan Nguyen, Level: Undergraduate, Mentor: Francesca Leasi, 2020, Individual Studies: Literature search for biogeography of meiofauna
242. Laurel Pelren, Level: Undergraduate, Mentor: Francesca Leasi, 2020, Individual Studies: Molecular assessment of meiofauna in Hamilton County
243. Jenna Brackett, Level: Undergraduate, Mentor: Henry Spratt, 2020, Bacterial contamination of surfaces in Veterinary rehabilitation clinics
244. John Eden, Level: Undergraduate, Mentor: Henry Spratt, 2020, Bacterial contamination of surfaces in a Neonatal Intensive Care Unit in a local hospital
245. Greyson Dukes, Level: Undergraduate, Mentor: Hill Craddock, 2020, DHON Thesis: Assessing lichen diversity along the Lucayan Trail, San Salvador Island, Bahamas

246. Colton Jones, Level: Undergraduate, Mentor: Hill Craddock, 2020, DHON Thesis: A contribution to the characterization of the diversity of ectomycorrhizal fungi associated with American chestnut at the UTC Fortwood Street nursery
247. Peyden Valentine, Level: Undergraduate, Mentor: Hill Craddock, 2020, DHON Thesis: A contribution to the macrofungi of Cloudland Canyon State Park
248. Evelyn Odle, Level: Undergraduate, Mentor: Hill Craddock, 2020, DHON Thesis: A small stem assay for chestnut blight resistance in hybrid American chestnut trees
249. Hannah Crawford, Level: Undergraduate, Mentor: Hill Craddock, 2020, DHON Thesis: Canopy openness as a predictor of growth for *Castanea dentata* seedlings in the Cumberland Uplands of Tennessee
250. Diana Sevier, Level: Undergraduate, Mentor: Hill Craddock, 2020, DHON Thesis (committee member)
251. Brooke Reichard, Level: Undergraduate, Mentor: Hope Klug, 2020, Independent studies evolution project
252. Braley Gentry, Level: Undergraduate, Mentor: Jennifer Boyd, 2020, Visualizing connectivity of ecological and evolutionary concepts—An exploration of research on plant species rarity
253. Brittany Long, Level: Undergraduate, Mentor: Jennifer Boyd, 2020, Rarity research botanical garden outreach
254. Evann Bailey, Level: Undergraduate, Mentor: Jennifer Boyd, 2020, DHON Committee: The effects of urbanization on insect morphology: a meta-analysis
255. Katie Tays, Level: Undergraduate, Mentor: Jennifer Boyd, 2020, Rarity research growth chamber experiments
256. Leslie Artry, Level: Undergraduate, Mentor: Jennifer Boyd, 2020, Rarity research botanical garden outreach
257. Thomas Wiegand, Level: Undergraduate, Mentor: Jennifer Boyd, 2020, DHON Advisor: Visualizing connectivity of ecological and evolutionary concepts—An exploration of research on plant species rarity
258. Camille Shipp, Level: Undergraduate, Mentor: Joey Shaw, 2020, URTOPS Thesis: National Park Herbarium Specimens at UTC
259. Daisy McMillan, Level: Undergraduate, Mentor: Joey Shaw, 2020, Undergraduate Research: Herbarium Studies
260. Dakila Ledesma, Level: Undergraduate, Mentor: Joey Shaw, 2020, Undergraduate Research Student: HerbASAP Development, Performant Barcodes, Herbarium Studies, AI recognition of Herbarium Specimens
261. Diana Sevier, Level: Undergraduate, Mentor: Joey Shaw, 2020, UHON Thesis: Ethnobotanical study of human uses of pteridophytes in Tennessee
262. Mallory Anderson, Level: Undergraduate, Mentor: Joey Shaw, 2020, Undergraduate Research: Floras of Tennessee, Revision of Vernon Bates Work
263. Miles Malicote, Level: Undergraduate, Mentor: Joey Shaw, 2020, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
264. Olivia Masterson, Level: Undergraduate, Mentor: Joey Shaw, 2020, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
265. Renae Johnson, Level: Undergraduate, Mentor: Joey Shaw, 2020, URTOPS Thesis: National Park Herbarium Specimens at UTC
266. Ronice Dube, Level: Undergraduate, Mentor: Joey Shaw, 2020, URTOPS Research Work Study: National Park Herbarium Specimens at UTC
267. Ronice Dube, Level: Undergraduate, Mentor: Joey Shaw, 2020, URTOPS Research Work Study: National Park Herbarium Specimens at UTC
268. Sydney Joseph, Level: Undergraduate, Mentor: Joey Shaw, 2020, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair

269. Tanaja Beckner, Level: Undergraduate, Mentor: Joey Shaw, 2020, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
270. Tesros Cherian, Level: Undergraduate, Mentor: John Tucker, 2020, DHON Thesis committee member, Community Based Participatory Research Methods and the Soil Lead Contamination of South Chattanooga
271. Jessica White, Level: Undergraduate, Mentor: Jonathan Mies, 2020, Hurricane-generated microseisms: power assessments
272. Madison Roberts, Level: Undergraduate, Mentor: Loren Hayes, 2020, Artiodactyla mating systems (NSF IRES)
273. Carter Jones, Level: undergraduate, Mentor: Sean Richards, 2020, Placental collection and analysis for metal analysis
274. Elizabeth Plunk, Level: undergraduate, Mentor: Sean Richards, 2020, Endocrine-Disrupting Air Pollutants and Their Effects on the Hypothalamus-Pituitary-Gonadal Axis
275. Jerrica Madden, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2020, Insect curation
276. Gavin Page, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2020, DHON: Troglotauna of Van Buren and White County: A Survey of Four Caves in the Mideastern Cumberland Plateau
277. Carmen Black, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2020, DHON: An Analysis of the Pollinators of *Echinacea purpurea* in Relation to their Perceived Efficiency and Color Preferences
278. Molly Acuff, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2020, Insect curation
279. Breanna McDevitt, Level: Undergraduate, Mentor: Thomas Wilson, 2020, Reseach
280. Joseph Broome, Level: Undergraduate, Mentor: Tim Gaudin, 2020, First record of extinct mylodontid ground sloth (*Glossotherium tropicorum*) from tar pits of Trinidad
281. Thomas Scaife, Level: Undergraduate, Mentor: Tim Gaudin, 2020, Description of the skull of the early Miocene ground sloth *Schismotherium*.
282. Katie Smith, Level: Undergraduate, Mentor: Tim Gaudin, 2020, Description of septomaxilla in adult *Choloepus hoffmanni*
283. Haley Head, Level: Undergraduate, Mentor: Tim Gaudin, 2020, Description of Pleistocene/Holocene vertebrate faunas from Lookout Mtn., TN.
284. Thomas Scaife, Level: Undergraduate, Mentor: Tim Gaudin, 2020, Description of a juvenile skull of the Holocene ground sloth *Acratocnus* ye from Haiti.
285. Morgan Osborn, Level: Undergraduate, Mentor: Tim Gaudin, 2020, Curatorial Assistant in Mammal collection of UTC Natural History Museum
286. Lucas Dunning, Level: Undergraduate, Mentor: Tim Gaudin, 2020, Curatorial Assistant in Mammal collection of UTC Natural History Museum
287. Aayushi Shah, Level: Undergraduate, Mentor: Tim Gaudin, 2020, Curatorial Assistant in Mammal collection of UTC Natural History Museum
288. Emma Madewell, Level: Undergraduate, Mentor: Thomas Wilson, 2020, Turtle Survival Alliance
289. Randi Mathisen, Level: Undergraduate, Mentor: Thomas Wilson, 2020, Turtle Survival Alliance
290. Randi Mathisen, Level: Undergraduate, Mentor: Thomas Wilson, 2020, Independent Study- Team Salamander
291. Abigal Stainbrook, Level: Undergraduate, Mentor: Thomas Wilson, 2020, Turtle Survival Alliance
292. Jeniel Patel, Level: Undergraduate, Mentor: Thomas Wilson, 2020, Turtle Survival Alliance

293. Riley Holcraft, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Internship Supervisor
294. Adria Osborne, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Internship Supervisor
295. Sarah Smith, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Internship Supervisor
296. Shannon Tattitch, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Internship Supervisor
297. Dana Stopinski, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Internship Supervisor
298. Allyson Wills, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Internship Supervisor
299. Lillian Cloer, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Independent Study
300. Sam Henry, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Independent Study
301. Riley Holcraft, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Independent Study
302. Leah Jackson, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Independent Study
303. Casper Kittle, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Independent Study
304. Gabby McCallister, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Independent Study
305. Lily Cooper, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Internship Supervisor
306. Daniel Holt, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Internship Supervisor
307. Sarah Hooper, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Internship Supervisor
308. Angela Shomo, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Internship Supervisor
309. Hunter Phillips, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Independent Study
310. Braxton Reker, Level: undergraduate, Mentor: Bradley Reynolds, 2020, Independent Study
311. Aylis Jeavons, Level: undergraduate, Mentor: Sarah Farnsley, 2020, Individual Studies
312. Alexandra Basar, Level: undergraduate, Mentor: Sarah Farnsley, 2020, Individual Studies
313. Tim Perkins, Level: Undergraduate, Mentor: Azad Hossain, 2021, Independent Study
314. Braxton Anzalone, Level: Undergraduate, Mentor: Azad Hossain, 2021, GERS Laboratory Research
315. Braxton Anzalone, Level: Undergraduate, Mentor: Azad Hossain, 2021, Independent Study
316. Abbie Faxon, Level: Undergraduate, Mentor: Azad Hossain, 2021, Senior Research
317. Abbie Faxon, Level: Undergraduate, Mentor: Azad Hossain, 2021, DHON Thesis (Major Advisor): Studying Suspended Sediment Concentrations in the South Chickamauga Creek of Chattanooga, TN using Satellite Imagery, Digital Image Processing, and Numeric Modeling
318. Caleb Mathias, Level: Undergraduate, Mentor: Azad Hossain, 2021, GERS Laboratory Research
319. Jacob Burleson, Level: Undergraduate, Mentor: Azad Hossain, 2021, GERS Laboratory Research
320. Gus Lipkin, Level: Undergraduate, Mentor: Azad Hossain, 2021, NSF REU (iCompBio)
321. Shelby Campbell, Level: Undergraduate, Mentor: Azad Hossain, 2021, Research Design

322. Caleb Jordan, Level: undergraduate, Mentor: Callie Adams, 2021, Independent Study
323. Jocelyn Adams, Level: Undergraduate, Mentor: David Giles, 2021, Research: Fatty Acid Assimilation Dynamics in *Vibrio cholerae*
324. Naina Patel, Level: Undergraduate, Mentor: David Giles, 2021, Honors Thesis: Effects of Fatty Acids (PUFAs) on the Antimicrobial Resistance in *Vibrio cholerae*
325. Elizabeth Allen, Level: Undergraduate, Mentor: David Giles, 2021, Honors Thesis: Fatty Acid and Piscidin Dynamics in *Vibrio cholerae*
326. Kayla Redmond, Level: Undergraduate, Mentor: David Giles, 2021, NSF REU: Bioinformatics of Fatty Acid Handling Machinery in Gammaproteobacteria
327. David Smith, Level: Undergraduate, Mentor: David Giles, 2021, Honors Thesis: Fatty Acid Responses in *Vibrio alginolyticus* and *Vibrio fischeri*
328. Olivia Chester, Level: Undergraduate, Mentor: David Giles, 2021, Research: Fatty Acid and Piscidin Dynamics in *Vibrio cholerae*
329. Tim Simmons, Level: Undergraduate, Mentor: David Giles, 2021, Individual Studies: Fatty Acid Responses in *Escherichia coli* and *Vibrio* species
330. Carter Jordan, Level: Undergraduate, Mentor: Francesca Leasi, 2021, Individual Studies: Visualization of rotifer distribution using GIS mapping.
331. Daniel See, Level: Undergraduate, Mentor: Henry Spratt, 2021, Bacterial contamination of surfaces in a Neonatal Intensive Care Unit in a local hospital
332. Seth Larue, Level: Undergraduate, Mentor: Henry Spratt, 2021, Quantification of viable plate counts linked to colony counts from line inoculations on bacterial growth media
333. Meredith Rippey, Level: Undergraduate, Mentor: Henry Spratt, 2021, Survival of pathogenic bacteria on "hip kits" used in OT rehabilitation
334. Tiffany Harvey, Level: Undergraduate, Mentor: Henry Spratt, 2021, Efficacy of a new device to deliver disinfectants to kill potentially pathogenic bacteria on shoe soles
335. Elaine Craig, Level: Undergraduate, Mentor: Hope Klug, 2021, Individual studies women in science project
336. Juanita Wade, Level: Undergraduate, Mentor: Hope Klug, 2021, Individual studies evolution project
337. Adreanna Hamilton, Level: Undergraduate, Mentor: Hope Klug, 2021, Individual studies evolution project
338. Monique Christian, Level: Undergraduate, Mentor: Hope Klug, 2021, iComp Bio sexual selection research
339. Nicole Locker, Level: Undergraduate, Mentor: Hope Klug, 2021, Individual studies evolution project
340. Adeline Goss, Level: Undergraduate, Mentor: Jennifer Boyd, 2021, Rarity research growth chamber experiments
341. Gabriella Logsdon, Level: Undergraduate, Mentor: Jennifer Boyd, 2021, *Platanthera integrilabia* field monitoring
342. Jenny O'Neill, Level: Undergraduate, Mentor: Jennifer Boyd, 2021, Rarity research growth chamber experiments
343. Jordan Parish, Level: Undergraduate, Mentor: Jennifer Boyd, 2021, Rarity research growth chamber experiments
344. Katie Tays, Level: Undergraduate, Mentor: Jennifer Boyd, 2021, Rarity research growth chamber experiments
345. Madison Brown, Level: Undergraduate, Mentor: Jennifer Boyd, 2021, *Platanthera integrilabia* field monitoring
346. Rebecca Angel, Level: Undergraduate, Mentor: Jennifer Boyd, 2021, *Platanthera integrilabia* field monitoring
347. Sarah Hagar, Level: Undergraduate, Mentor: Jennifer Boyd, 2021, Rarity research growth chamber experiments

348. Alana Hicks, Level: Undergraduate, Mentor: Joey Shaw, 2021, UHON Thesis: iNaturalist Flora of Curtis B. Henson Cave Preserve
349. Dakila Ledesma, Level: Undergraduate, Mentor: Joey Shaw, 2021, Undergraduate Research Student: HerbASAP Development, Performant Barcodes, Herbarium Studies, AI recognition of Herbarium Specimens
350. Olivia Masterson, Level: Undergraduate, Mentor: Joey Shaw, 2021, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
351. Olivia Masterson, Level: Undergraduate, Mentor: Joey Shaw, 2021, Individual Study: Herbarium Specimen Mounting, Databasing, Digitization, Repair
352. Renae Johnson, Level: Undergraduate, Mentor: Joey Shaw, 2021, URTOPS Thesis: National Park Herbarium Specimens at UTC
353. Samantha Doss Watson, Level: Undergraduate, Mentor: Joey Shaw, 2021, URTOPS Thesis: National Park Herbarium Specimens at UTC
354. Albert Borum, Level: Undergraduate, Mentor: Jonathan Mies, 2021, Preferred orientation of quartz grains in Hesse sandstone
355. Madison Roberts, Level: Undergraduate, Mentor: Loren Hayes, 2021, Mating systems of mammals
356. Madison Townsend, Level: Undergraduate, Mentor: Loren Hayes, 2021, Marine mammal social organization
357. Cristina Castro, Level: Undergraduate, Mentor: Loren Hayes, 2021, NSF IRES - University of Chicago
358. Myndi Tran, Level: Undergraduate, Mentor: Loren Hayes, 2021, NSF IRES - West Virginia Wesleyan
359. Emily Schuster, Level: Undergraduate, Mentor: Margaret Kovach, 2021, Understanding the Molecular Mechanism of ILV1 Stress Sensitivity in Yeast
360. Olivia Denton, Level: undergraduate, Mentor: Sean Richards, 2021, Metabolomics of endometrial cancer data collection
361. Braxton Eden, Level: undergraduate, Mentor: Sean Richards, 2021, Internship supervisor
362. Weston Chambers, Level: undergraduate, Mentor: Sean Richards, 2021, Per-and Polyfluorinated Alkyl Substance (PFAS) Impairment of Reproduction
363. Jaida Hopkins, Level: undergraduate, Mentor: Sean Richards, 2021, Per-and Polyfluorinated Alkyl Substance (PFAS) Impairment of Reproduction
364. Samantha Sweck, Level: undergraduate, Mentor: Sean Richards, 2021, The Diagnosis, Clinical Course, Treatment, and Prevention of the Rabies Virus
365. Mary Davis, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2021, Insect curation
366. Jillian Saraney, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2021, Insect curation
367. Ajla Kojic, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2021, Insect databasing
368. Shelby Erwin, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2021, Insect databasing
369. Miranda Linkous, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2021, Insect databasing
370. Louanne Maes, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2021, Insect databasing
371. Abbie Faxon, Level: Undergraduate, Mentor: Tahmina Shirmeen, 2021, DHON Thesis Committee Member
372. Tabitha Wilson, Level: Undergraduate, Mentor: Thomas Wilson, 2021, Research
373. Katie Smith, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Description of septomaxilla in adult *Choloepus hoffmanni*

374. Haley Head, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Description of Pleistocene/Holocene vertebrate faunas from Lookout Mtn., TN.
375. Thomas Scaife, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Description of a juvenile skull of the Holocene ground sloth *Acratocnus* ye from Haiti.
376. Arly Benitez, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Description of the pes and metacarpus of the early Miocene extinct anteater *Protamandua rothi*, based on micro-CT scans of specimen
377. Micayla Hobson, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Description of the skull of the early Miocene extinct anteater *Protamandua rothi*, based on micro-CT scans of specimen
378. Madison McKinney, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Description of the pes and metacarpus of the early Miocene extinct anteater *Protamandua rothi*, based on micro-CT scans of specimen
379. Evie Kennedy, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Description of the skull of the early Miocene extinct anteater *Protamandua rothi*, based on micro-CT scans of specimen
380. Emily Richards, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Independent study to interview researchers of orca (*Orcinus orca*) populations in Puget Sound, WA
381. Emily Richards, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Animal husbandry and enrichment internship at Reflection Riding Nature Center and Arboretum
382. Aayushi Shah, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Curatorial Assistant in Mammal collection of UTC Natural History Museum
383. Lucas Dunning, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Curatorial Assistant in Mammal collection of UTC Natural History Museum
384. Madison McKinney, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Curatorial Assistant in Mammal collection of UTC Natural History Museum
385. Claire Schofield, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Curatorial Assistant in Mammal collection of UTC Natural History Museum
386. Jazz Holcomb, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Curatorial Assistant in Mammal collection of UTC Natural History Museum
387. Sarah Sisemore, Level: Undergraduate, Mentor: Tim Gaudin, 2021, Curatorial Assistant in Mammal collection of UTC Natural History Museum
388. Emma Madewell, Level: Undergraduate, Mentor: Thomas Wilson, 2021, Turtle Survival Alliance
389. Hannah Baker, Level: Undergraduate, Mentor: Thomas Wilson, 2021, Turtle Survival Alliance
390. Molly Mayes, Level: Undergraduate, Mentor: Thomas Wilson, 2021, Turtle Survival Alliance
391. Abigail Stainbrook, Level: Undergraduate, Mentor: Thomas Wilson, 2021, Turtle Survival Alliance
392. Jeniel Patel, Level: Undergraduate, Mentor: Thomas Wilson, 2021, Turtle Survival Alliance
393. Caitlin Baird, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
394. Giron Caldwell, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
395. Esme Hamilton, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
396. Morgan Leek, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
397. Lexi Alan, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Independent Study

398. Austin Averill, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Independent Study
399. Aurora Cotton-Suda, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Independent Study
400. McKaylah Hicks, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Independent Study
401. Nicole Rogers, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Independent Study
402. Angelica Urquizo, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Independent Study
403. Lauren Solomon, Level: undergraduate, Mentor: Ethan Carver, 2021, Honors Thesis: Examining the intersections of art and science through photomicrography
404. Audrey Creighton, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
405. Kohl Fuller, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
406. D'lyn Keiser, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
407. Gabby McCallister, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
408. Marcus Morris, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
409. Emma Mullican, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
410. Claire Mullin, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
411. Alysia Reid, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
412. Jesse Swafford, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
413. Derik Verkest, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
414. Randy Allen, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Independent Study
415. Daisy McMillion, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Independent Study
416. Jacob Melton, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Independent Study
417. Nick Kelly, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Independent Study
418. Randy Allen, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
419. Luke Mainello, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
420. Angelique Peterson, Level: undergraduate, Mentor: Bradley Reynolds, 2021, Internship Supervisor
421. Caleb Jordan, Level: undergraduate, Mentor: Sarah Farnsley, 2021, Individual Studies
422. Claire Reticker, Level: undergraduate, Mentor: Sarah Farnsley, 2021, UHON: Discrepancies Amongst UTC Students' Diets and Their Understanding of Their Role in Environmental Activism
423. Quillen Thornton, Level: Undergraduate, Mentor: Amy Brock-Hon, 2022, Construction of 3D models from petrocalcic materials

424. Amber Newbille, Level: Undergraduate, Mentor: Amy Brock-Hon, 2022, Construction of 3D models from petrocalcic materials
425. Sam Doss-Watson, Level: Undergraduate, Mentor: Amy Brock-Hon, 2022, Construction of 3D models from petrocalcic materials
426. Heather Qualls, Level: Undergraduate, Mentor: Amy Brock-Hon, 2022, Map organization
427. Heather Qualls, Level: Undergraduate, Mentor: Amy Brock-Hon, 2022, Mapping of Cumberland Plateau Depressions
428. Amber Newbille, Level: Undergraduate, Mentor: Amy Brock-Hon, 2022, Mapping of Cumberland Plateau Depressions
429. Quillen Thornton, Level: Undergraduate, Mentor: Amy Brock-Hon, 2022, Mapping of Cumberland Plateau Depressions
430. Sera Thomas, Level: Undergraduate, Mentor: Amy Brock-Hon, 2022, Mapping of Cumberland Plateau Depressions
431. Caden Powers, Level: Undergraduate, Mentor: Amy Brock-Hon, 2022, Mapping of Cumberland Plateau Depressions
432. Braxton Anzalone, Level: Undergraduate, Mentor: Amy Brock-Hon, 2022, Mapping of Cumberland Plateau Depressions
433. Abbie Faxon, Level: Undergraduate, Mentor: Azad Hossain, 2022, Independent Study
434. Hannah Bowman, Level: Undergraduate, Mentor: Azad Hossain, 2022, Independent Study
435. Shelby Campbell, Level: Undergraduate, Mentor: Azad Hossain, 2022, Independent Study
436. William Bordash, Level: Undergraduate, Mentor: Azad Hossain, 2022, Research Project
437. Matthew Mollica, Level: Undergraduate, Mentor: Azad Hossain, 2022, Research Project
438. Matthew Mollica, Level: Undergraduate, Mentor: Azad Hossain, 2022, Independent Study
439. Shelby Campbell, Level: Undergraduate, Mentor: Azad Hossain, 2022, Research Project
440. Shelby Campbell, Level: Undergraduate, Mentor: Azad Hossain, 2022, GERS Laboratory Research
441. Braxton Anzalone, Level: Undergraduate, Mentor: Azad Hossain, 2022, GERS Laboratory Research
442. Braxton Anzalone, Level: Undergraduate, Mentor: Azad Hossain, 2022, Geology Capstone Project
443. Zeltis Beldavs, Level: Undergraduate, Mentor: Azad Hossain, 2022, Independent Study
444. Patrick Basham, Level: Undergraduate, Mentor: Azad Hossain, 2022, GERS Laboratory Research
445. Anyliah M. Whitfield King, Level: Undergraduate, Mentor: Azad Hossain, 2022, NSF REU (iCompBio)
446. Heather Dayton, Level: Undergraduate, Mentor: David Aborn, 2022, Internship advisor: Greenhouse caretaker at Crabtree Farms
447. Ashlyn Mann, Level: Undergraduate, Mentor: David Giles, 2022, Individual Studies: Cellular Biology Preparation and Microbiology Assistant on Several Projects
448. Benjamin House, Level: Undergraduate, Mentor: David Giles, 2022, Honors Thesis: Fatty Acid Responses in *Aeromonas salmonicida*
449. Naina Patel, Level: Undergraduate, Mentor: David Giles, 2022, Honors Thesis: Effects of Fatty Acids (PUFAs) on the Antimicrobial Resistance in *Vibrio cholerae*
450. Meredith Grant, Level: Undergraduate, Mentor: David Giles, 2022, Research: Fatty Acid Responses in *Aeromonas hydrophila*
451. Olivia Chester, Level: Undergraduate, Mentor: David Giles, 2022, Research: Fatty Acid and Piscidin Dynamics in *Vibrio cholerae*

452. Gillian Morton, Level: Undergraduate, Mentor: David Giles, 2022, Fatty Acid Responses in *Aeromonas hydrophila*
453. Martina Leach, Level: Undergraduate, Mentor: DeAnna Beasley, 2022, Microclimate variability on urban greenways
454. Sydney Gibson, Level: Undergraduate, Mentor: DeAnna Beasley, 2022, Microclimate conditions and decomposition in urban green infrastructure
455. Ashley Preast, Level: Undergraduate, Mentor: DeAnna Beasley, 2022, The ecological function of urban bioretention gardens: A study of decomposition
456. Sebastian Jimenez, Level: Undergraduate, Mentor: Fernando Alda, 2022, Individual Studies
457. Breann Larson, Level: Undergraduate, Mentor: Fernando Alda, 2022, Individual Studies
458. Joseph Watson, Level: Undergraduate, Mentor: Fernando Alda, 2022, Individual Studies
459. Emma Mabry, Level: Undergraduate, Mentor: Francesca Leasi, 2022, Individual Studies: Sediment analysis
460. Seth Larue, Level: Undergraduate, Mentor: Henry Spratt, 2022, Honors Thesis
461. Meredith Rippy, Level: Undergraduate, Mentor: Henry Spratt, 2022, Honors Thesis
462. Daniel See, Level: Undergraduate, Mentor: Henry Spratt, 2022, Honors Thesis
463. Ashely George, Level: Undergraduate, Mentor: Henry Spratt, 2022, Survival of potentially pathogenic bacteria on different types of plastic and rubber surfaces used in healthcare settings
464. Ezza Zahid, Level: Undergraduate, Mentor: Henry Spratt, 2022, Characterization of *Staphylococcus* species found on surfaces of a Neonatal Intensive Care Unit of a local hospital
465. Avery Gibson, Level: Undergraduate, Mentor: Henry Spratt, 2022, Development of a novel technique to detect bacterial biofilms on porcelain surfaces that are similar to those used in teeth implant
466. Mitchell Hibbs, Level: Undergraduate, Mentor: Hope Klug, 2022, Mate choice research
467. Ranna Dorani, Level: Undergraduate, Mentor: Hope Klug, 2022, Parental care and sexual selection research
468. Janki Patel, Level: Undergraduate, Mentor: Jannatul Ferdoush, 2022, Understanding the overexpression of transcription factors in cancer cells
469. Annabree Corlew, Level: Undergraduate, Mentor: Jennifer Boyd, 2022, DHON Advisor: Investigating the utility of high-throughput phenotyping for ecological applications
470. Cora Flemming, Level: Undergraduate, Mentor: Jennifer Boyd, 2022, Rarity research growth chamber experiments
471. Jessica Anchanattu, Level: Undergraduate, Mentor: Jennifer Boyd, 2022, Rarity research growth chamber experiments
472. Leslie Eselgroth, Level: Undergraduate, Mentor: Jennifer Boyd, 2022, Rarity research growth chamber experiments
473. Noura Elsaed, Level: Undergraduate, Mentor: Jennifer Boyd, 2022, Rarity research common garden experiments
474. Uma Plambeck, Level: Undergraduate, Mentor: Jennifer Boyd, 2022, Rarity research growth chamber experiments
475. Alana Hicks, Level: Undergraduate, Mentor: Joey Shaw, 2022, UHON Thesis: iNaturalist Flora of Curtis B. Henson Cave Preserve.
476. Alex Harb, Level: Undergraduate, Mentor: Joey Shaw, 2022, Individual Study: National Park Herbarium Specimens at UTC
477. Dakila Ledesma, Level: Undergraduate, Mentor: Joey Shaw, 2022, Undergraduate Research Student: HerbASAP Development, Performant Barcodes, Herbarium Studies, AI recognition of Herbarium Specimens
478. Ethan Bull, Level: Undergraduate, Mentor: Joey Shaw, 2022, Individual Study: National Park Herbarium Specimens at UTC

479. Grayson Davis, Level: Undergraduate, Mentor: Joey Shaw, 2022, Individual Study: Herbarium Studies
480. Maya Burks, Level: Undergraduate, Mentor: Joey Shaw, 2022, Individual Study: National Park Herbarium Specimens at UTC
481. Samantha Doss Watson, Level: Undergraduate, Mentor: Joey Shaw, 2022, URTOPS Thesis: National Park Herbarium Specimens at UTC
482. Katherine Green, Level: Undergraduate, Mentor: John Tucker, 2022, Tennessee Interbasin Water Transfer Act Analysis
483. Dillon Champion, Level: Undergraduate, Mentor: John Tucker, 2022, Tennessee Interbasin Water Transfer Act Analysis
484. Abdol Abazid, Level: Undergraduate, Mentor: Loren Hayes, 2022, DHON: Microbes along an urban gradient
485. Madison Roberts, Level: Undergraduate, Mentor: Loren Hayes, 2022, Mating systems of mammals
486. Olivia Denton, Level: undergraduate, Mentor: Sean Richards, 2022, Metabolomics of endometrial cancer and endometriosis data collection
487. Marlee Sanders, Level: undergraduate, Mentor: Sean Richards, 2022, BGE Honors College Department Thesis
488. Ailene Li, Level: undergraduate, Mentor: Sean Richards, 2022, Metabolomics of endometrial cancer and endometriosis data collection
489. Shauna Crawford, Level: undergraduate, Mentor: Sean Richards, 2022, Metabolomics of endometrial cancer and endometriosis data collection
490. Bahar Folad, Level: undergraduate, Mentor: Sean Richards, 2022, Metabolomics of endometrial cancer and endometriosis data collection
491. Storm Walker, Level: undergraduate, Mentor: Sean Richards, 2022, Metabolomics of endometrial cancer and endometriosis data collection
492. Zoe Sasser, Level: undergraduate, Mentor: Sean Richards, 2022, Brock Scholar Student Research Fellowship Project
493. Noura Elsaed, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2022, Insect curation
494. Angelica Urquiza, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2022, Insect curation
495. Carmen Harvey, Level: Undergraduate, Mentor: Thomas Wilson, 2022, Research
496. Molly Mayes, Level: Undergraduate, Mentor: Thomas Wilson, 2022, Turtle Survival Alliance
497. Emma Madewell, Level: Undergraduate, Mentor: Thomas Wilson, 2022, Turtle Survival Alliance
498. Lilli Allen, Level: Undergraduate, Mentor: Thomas Wilson, 2022, Independent Study- Geospatial
499. Hunter Burnheimer, Level: Undergraduate, Mentor: Thomas Wilson, 2022, Independent Study Research- Geospatial
500. Jacob Goss, Level: Undergraduate, Mentor: Thomas Wilson, 2022, Independent Study Research- Geospatial
501. Stone Seagraves, Level: Undergraduate, Mentor: Thomas Wilson, 2022, Independent Study Research- Geospatial
502. Jillian Kruck, Level: Undergraduate, Mentor: Thomas Wilson, 2022, Independent Study- Team Salamander
503. Denver Rogers, Level: Undergraduate, Mentor: Thomas Wilson, 2022, Independent Study- Team Salamander
504. Sarah Sisemore, Level: Undergraduate, Mentor: Thomas Wilson, 2022, Turtle Survival Alliance

- 505. Bliss Murphy, Level: Undergraduate, Mentor: Thomas Wilson, 2022, Turtle Survival Alliance
- 506. McKenzie Ringer, Level: Undergraduate, Mentor: Thomas Wilson, 2022, Turtle Survival Alliance
- 507. Dominick Hazeltine, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 508. Rachel Johnson, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 509. Jessica Laubacher, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 510. Gabby Logsdon, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 511. Emily Mathis, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 512. Julia Prins, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 513. Elaine Pulliam, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 514. Claire Stamper, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 515. Brody Helton, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Independent Study
- 516. Michaela Hyde, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Independent Study
- 517. Seth Little, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Independent Study
- 518. Emma Mabry, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Independent Study
- 519. Anna Claire O'Neill, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Independent Study
- 520. Henry Avans, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 521. Emma Covington, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 522. McKaylah Hicks, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 523. Matthew Moseley, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 524. Sarah Pimental, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 525. Anna V. Smith, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 526. Henry Avans, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
- 527. Madison Cassella, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Independent Study
- 528. Alex Lawless, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Independent Study
- 529. Matthew Phillips, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Independent Study
- 530. Cole White, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Independent Study

531. Lauren Solomon, Level: undergraduate, Mentor: Ethan Carver, 2022, Honors Thesis: Examining the intersections of art and science through photomicrography
532. Morgan Chipperfield, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Internship Supervisor
533. Carter Woehlert, Level: undergraduate, Mentor: Bradley Reynolds, 2022, Independent Study
534. Lauren Solomon, Level: undergraduate, Mentor: Ethan Carver, 2022, Honors Thesis: Examining the intersections of art and science through photomicrography
535. Michael Beasley, Level: undergraduate, Mentor: Sarah Farnsley, 2022, Individual Studies
536. Patrick Cuttle, Level: undergraduate, Mentor: Sarah Farnsley, 2022, Individual Studies
537. Jalen Prather, Level: undergraduate, Mentor: Sarah Farnsley, 2022, Individual Studies
538. Quillen Thornton, Level: Undergraduate, Mentor: Amy Brock-Hon, 2023, Finalizing geologic map of the Overton NE, NV 7.5 minute quadrangle
539. Amber Newbille, Level: Undergraduate, Mentor: Ashley Manning-Berg, 2023, Precipitation of amorphous silica from Proterozoic artificial seawater at low-temperatures
540. Dakota Bell, Level: Undergraduate, Mentor: Ashley Manning-Berg, 2023, Identifying taphonomic changes to microorganisms during bacterial composition and verifying decomposition pathways of microbial mats and mixtures
541. Emma Wu, Level: Undergraduate, Mentor: Azad Hossain, 2023, NSF REU (iCompBio)
542. Maya Santos, Level: Undergraduate, Mentor: Azad Hossain, 2023, Independent Study
543. Breann Larson, Level: Undergraduate, Mentor: Azad Hossain, 2023, Independent Study
544. Breann Larson, Level: Undergraduate, Mentor: Azad Hossain, 2023, GERS Laboratory Research
545. Patrick Basham, Level: Undergraduate, Mentor: Azad Hossain, 2023, GERS Laboratory Research
546. Braxton Anzalone, Level: Undergraduate, Mentor: Azad Hossain, 2023, Geology Capstone Project
547. Zeltis Beldavs, Level: Undergraduate, Mentor: Azad Hossain, 2023, GERS Laboratory Research
548. Allie English, Level: Undergraduate, Mentor: David Aborn, 2023, Internship advisor: Native plant apprentice at Reflection Riding Arboretum and Nature Center
549. Johanna Lansing, Level: Undergraduate, Mentor: David Aborn, 2023, Internship advisor: Conservation education intern at Disney's Animal Kingdom Them Park
550. Morgan Griffin, Level: Undergraduate, Mentor: David Aborn, 2023, Individual Studies Advisor: Tree Swallow nest monitoring assistant
551. Saksham Saksena, Level: Undergraduate, Mentor: David Giles, 2023, NSF REU: Bioinformatics of Fatty Acid Handling Machinery in Gammaproteobacteria
552. Christina Harris, Level: Undergraduate, Mentor: David Giles, 2023, Honors Thesis: Fatty Acid and Piscidin Dynamics in *Vibrio cholerae*
553. Abdol Munim-Abazid, Level: Undergraduate, Mentor: David Giles, 2023, NSF REU: Microbial Diversity of a Generalist Ant on an Urban-Rural Gradient
554. Meredith Grant, Level: Undergraduate, Mentor: David Giles, 2023, Research: Fatty Acid Responses in *Aeromonas hydrophila*
555. Benjamin House, Level: Undergraduate, Mentor: David Giles, 2023, Research: Fatty Acid Responses in *Aeromonas salmonicida*
556. Gillian Morton, Level: Undergraduate, Mentor: David Giles, 2023, Research: Fatty Acid Responses in *Aeromonas hydrophila*
557. Jake Slowinski, Level: Undergraduate, Mentor: DeAnna Beasley, 2023, Terrestrial Invertebrate Diversity in Urban Bioretention Gardens

558. Griselda Valdez, Level: Undergraduate, Mentor: DeAnna Beasley, 2023, NSF-REU Collaborative Site: The Socio-Ecological Role of Greenways in Urban Systems - An Interdisciplinary Approach
559. Josephine Saikali, Level: Undergraduate, Mentor: DeAnna Beasley, 2023, NSF-REU Collaborative Site: The Socio-Ecological Role of Greenways in Urban Systems - An Interdisciplinary Approach
560. Olivia Lovett, Level: Undergraduate, Mentor: DeAnna Beasley, 2023, NSF-REU Collaborative Site: The Socio-Ecological Role of Greenways in Urban Systems - An Interdisciplinary Approach
561. Vivienne Raczkowski, Level: Undergraduate, Mentor: DeAnna Beasley, 2023, NSF-REU Collaborative Site: The Socio-Ecological Role of Greenways in Urban Systems - An Interdisciplinary Approach
562. Brooke Bellmar, Level: Undergraduate, Mentor: DeAnna Beasley, 2023, NSF-REU Collaborative Site: The Socio-Ecological Role of Greenways in Urban Systems - An Interdisciplinary Approach
563. Abby Jack, Level: Undergraduate, Mentor: DeAnna Beasley, 2023, NSF-REU Collaborative Site: The Socio-Ecological Role of Greenways in Urban Systems - An Interdisciplinary Approach
564. Cade Hansen, Level: Undergraduate, Mentor: DeAnna Beasley, 2023, NSF-REU Collaborative Site: The Socio-Ecological Role of Greenways in Urban Systems - An Interdisciplinary Approach
565. Milo Williams Thompson, Level: Undergraduate, Mentor: DeAnna Beasley, 2023, NSF-REU Collaborative Site: The Socio-Ecological Role of Greenways in Urban Systems - An Interdisciplinary Approach
566. Hanna Mohammed, Level: Undergraduate, Mentor: DeAnna Beasley, 2023, NSF-REU Collaborative Site: The Socio-Ecological Role of Greenways in Urban Systems - An Interdisciplinary Approach
567. Kylie Orf, Level: Undergraduate, Mentor: DeAnna Beasley, 2023, NSF-REU Collaborative Site: The Socio-Ecological Role of Greenways in Urban Systems - An Interdisciplinary Approach
568. Miranda Lighter, Level: Undergraduate, Mentor: DeAnna Beasley, 2023, Using Bike Transects to Monitor Flying Insect Diversity on Urban Greenways
569. Emily Cloud, Level: Undergraduate, Mentor: DeAnna Beasley, 2023, Using Bike Transects to Monitor Flying Insect Diversity on Urban Greenways
570. Zachary Hendren, Level: Undergraduate, Mentor: Francesca Leasi, 2023, Individual Studies: Meiofauna culture and DNA extraction
571. Ashely George, Level: Undergraduate, Mentor: Henry Spratt, 2023, Honors Thesis
572. Ezza Zahid, Level: Undergraduate, Mentor: Henry Spratt, 2023, Honors Thesis
573. Avery Gibson, Level: Undergraduate, Mentor: Henry Spratt, 2023, Development of a novel technique to detect bacterial biofilms on porcelin surfaces that are similar to those used in teeth implant
574. Meredith Rippy, Level: Undergraduate, Mentor: Henry Spratt, 2023, Development of a novel biosensor to detect Staphylococcus aureus using aptamers
575. Mackenzie Smith, Level: Undergraduate, Mentor: Henry Spratt, 2023, Bacterial contamination of surfaces in Veterinary hosiptal ICU
576. Faith Redding, Level: Undergraduate, Mentor: Henry Spratt, 2023, Bacterial contamination of surfaces in newly constructed Veterinary hosiptal
577. Finn Basler, Level: Undergraduate, Mentor: Henry Spratt, 2023, The use of biochar as a means to reduce CO2 emissions
578. Sarah Cardwell, Level: Undergraduate, Mentor: Henry Spratt, 2023, Bacterial contamination of surfaces in newly constructed Veterinary hosiptal

579. Trish Nguyen, Level: Undergraduate, Mentor: Hill Craddock, 2023, DHON Thesis: A small stem assay using hypovirulent *Cryphonectria parasitica* to screen *Castanea dentata* backcross F2 families may set the stage for long-term survival
580. Kaitlyn Harden, Level: Undergraduate, Mentor: Hill Craddock, 2023, DHON Thesis: Oxalic acid leaf disk soak assay is a new possibility in screening for blight resistance in *Castanea* species
581. Mallory Anderson, Level: Undergraduate, Mentor: Hill Craddock, 2023, DHON Thesis (committee member)
582. Alyssa Jesse Hugo, Level: Undergraduate, Mentor: Jannatul Ferdoush, 2023, Understanding the overexpression of transcription factors in cancer cells
583. Keyle Brandt, Level: Undergraduate, Mentor: Jennifer Boyd, 2023, Mapping the Signal Mountain Honor Trees
584. Annabree Corlew, Level: Undergraduate, Mentor: Jennifer Boyd, 2023, DHON Advisor: Investigating the utility of high-throughput phenotyping for ecological applications
585. Julia Prins, Level: Undergraduate, Mentor: Jennifer Boyd, 2023, Curation of rarity literature base
586. Sophia Gibby, Level: Undergraduate, Mentor: Jennifer Boyd, 2023, Drafting manuscript: Inbreeding depression and weak Allee effect elucidate persistence of small populations of endangered *Pityopsis ruthii*
587. Alex Nation, Level: Undergraduate, Mentor: Jennifer Boyd, 2023, Mapping the Signal Mountain Honor Trees
588. Bailee Lessenberry, Level: Undergraduate, Mentor: Joey Shaw, 2023, Individual Study: National Park Herbarium Specimens at UTC
589. Matthais Terpstra, Level: Undergraduate, Mentor: Joey Shaw, 2023, Individual Study: National Park Herbarium Specimens at UTC
590. Ryland Jones, Level: Undergraduate, Mentor: Joey Shaw, 2023, Summarizing Watch List Species for Tennessee
591. Dillon Champion, Level: Undergraduate, Mentor: John Tucker, 2023, Tennessee Interbasin Water Transfer Act Analysis
592. Austin Stiltner, Level: Undergraduate, Mentor: John Tucker, 2023, Analysis of Sackett v. EPA, limiting EPA wetland regulatory authority under the section 404 of the Clean Water Act
593. Emily Patton, Level: Undergraduate, Mentor: John Tucker, 2023, DHON Director: How legal scholarship on mountaintop removal practices...illuminate the relationship between environmental law and Appalachian identity.
594. Rhian Schliwa, Level: Undergraduate, Mentor: John Tucker, 2023, EPA CUPP Chattanooga Lead Project Experiential Learning
595. Katherine Green, Level: Undergraduate, Mentor: John Tucker, 2023, EPA CUPP Chattanooga Lead Project Experiential Learning
596. Gabby Logsdon, Level: Undergraduate, Mentor: John Tucker, 2023, EPA CUPP Chattanooga Lead Project Experiential Learning
597. Mackenzie Ringer, Level: Undergraduate, Mentor: John Tucker, 2023, EPA CUPP Chattanooga Lead Project Experiential Learning
598. Madison Roberts, Level: Undergraduate, Mentor: Loren Hayes, 2023, DHON Mating systems of mammals
599. Madison Roberts, Level: Undergraduate, Mentor: Loren Hayes, 2023, NSF IRES: Degu social organization
600. Tiffany Reid, Level: Undergraduate, Mentor: Loren Hayes, 2023, Meta analysis of social instability
601. Marlee Sanders, Level: undergraduate, Mentor: Sean Richards, 2023, BGE Honors College Department Thesis

602. Ailene Li, Level: undergraduate, Mentor: Sean Richards, 2023, Metabolomics of endometrial cancer and endometriosis data collection
603. Bahar Folad, Level: undergraduate, Mentor: Sean Richards, 2023, Metabolomics of endometrial cancer and endometriosis data collection
604. Tarik Dedovic, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2023, Insect databasing
605. Mallory Anderson, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2023, DHON: Species Diversity of Coleoptera Populations in an Urban Garden in Chattanooga, Tennessee
606. Grace Ann Dunavant, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2023, Insect databasing
607. Jeffrey Moser, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2023, Insect curation
608. Sydney Carr, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2023, Insect SEM photography
609. Cecilia Abello, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2023, Insect curation
610. Maria Pacheco, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2023, Insect curation
611. Lauren Solomon, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2023, Insect photography
612. Kevin O'Malley, Level: Undergraduate, Mentor: Stylianos Chatzimanolis, 2023, Insect curation
613. Carig Sanders, Level: Undergraduate, Mentor: Tim Gaudin, 2023, 3D printing of STL files based on CT scans of Eocene fossil edentates *Eurotamandua joresi* and *Metacheiromys marshi* from Senckenberg Forschungsinstitut (Frankfurt, Germany); and, digital 3D reconstructions of the skeleton of the early Miocene extinct anteater
614. Lauren Dunn, Level: Undergraduate, Mentor: Tim Gaudin, 2023, Description of the skull of the early Miocene extinct anteater *Protamandua rothi*, based on micro-CT scans of specimen
615. Katherine Morris, Level: Undergraduate, Mentor: Tim Gaudin, 2023, Description of the pes and metacarpus of the early Miocene extinct anteater *Protamandua rothi*, based on micro-CT scans of specimen
616. Litzy Perez, Level: Undergraduate, Mentor: Tim Gaudin, 2023, Description of the pes and metacarpus of the early Miocene extinct anteater *Protamandua rothi*, based on micro-CT scans of specimen
617. Megan Ferrell, Level: Undergraduate, Mentor: Tim Gaudin, 2023, Curatorial Assistant in Mammal collection of UTC Natural History Museum
618. Mika Claybrook, Level: Undergraduate, Mentor: Tim Gaudin, 2023, Curatorial Assistant in Mammal collection of UTC Natural History Museum
619. Sarah Sisemore, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Turtle Survival Alliance
620. Emma Madewell, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Turtle Survival Alliance
621. Jillian Kruck, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Independent Study-Team Salamander
622. Gabby Logsdan, Level: Undergraduate, Mentor: Thomas Wilson, 2023, The Wildlife Society Conclave Competition Team
623. Tabitha Wilson, Level: Undergraduate, Mentor: Thomas Wilson, 2023, The Wildlife Society Conclave Competition Team
624. McKenzie Ringer, Level: Undergraduate, Mentor: Thomas Wilson, 2023, The Wildlife Society Conclave Competition Team

- 625. Sarah Sisemore, Level: Undergraduate, Mentor: Thomas Wilson, 2023, The Wildlife Society Conclave Competition Team
- 626. Cassie Bonnor, Level: Undergraduate, Mentor: Thomas Wilson, 2023, The Wildlife Society Conclave Competition Team
- 627. Bliss Murphy, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Turtle Survival Alliance
- 628. Tabitha Wilson, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Turtle Survival Alliance
- 629. Hope Fazo, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Research
- 630. Sarah Sisemore, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Research
- 631. Michale Fava, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 632. Imani Gardner, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 633. Morgan Griffin, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 634. Miranda Lighter, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 635. Seth Little, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 636. Carter Woehlert, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 637. Zach Anderson, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 638. Dominick Hazeltine, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 639. Katie Hemauer, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 640. Autumn Love, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 641. Emma Madewell, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 642. Nicholas Myers, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 643. Juliana Mynatt, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 644. Austin Stilner, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 645. Mimi White, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 646. Anna Wright, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Amphibian Ecology and Conservation Project
- 647. Miranda Lighter, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Research Co-Supervisor
- 648. McKenzie Ringer, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Turtle Survival Alliance
- 649. Bliss Murphy, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Research Biodiversity
- 650. Lauren Hull, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Turtle Survival Alliance

651. Lauren Hull, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Research Biodiversity
652. Tabitha Wilson, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Research Biodiversity
653. Justin Spencer, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Research Biodiversity
654. Justin Spencer, Level: Undergraduate, Mentor: Thomas Wilson, 2023, Turtle Survival Alliance
655. Skye Chancellor, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Internship Supervisor
656. Sophia Dieckhaus, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Internship Supervisor
657. Marcus Hollo, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Internship Supervisor
658. Aaron Johnson, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Internship Supervisor
659. Kristen Larkin, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Internship Supervisor
660. Jazz Holcomb, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Departmental Thesis
661. Austin Ash, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Independent Study
662. Briana Eckert, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Independent Study
663. Katie Hemauer, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Independent Study
664. Michael Minnick, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Independent Study
665. Sophia Sporsen, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Independent Study
666. Ashley Street, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Independent Study
667. Joseph Watson, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Independent Study
668. Anna Wright, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Independent Study
669. Patrick Basham, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Internship Supervisor
670. Connor Bassham, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Internship Supervisor
671. Morgan Chipperfield, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Internship Supervisor
672. Collin Esslinger, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Internship Supervisor
673. Alex Garretson, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Internship Supervisor
674. Julia Grubb, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Independent Study
675. Gabby Logsdon, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Independent Study
676. Mackenzie Ringer, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Independent Study
677. Stephen Steinbach, Level: undergraduate, Mentor: Bradley Reynolds, 2023, Independent Study

678. Aaron Johnson, Level: undergraduate, Mentor: Elise Chapman, 2023, Individual Studies
679. Sabrina Kopecky, Level: undergraduate, Mentor: Elise Chapman, 2023, Individual Studies
680. Mackenzie Davenport, Level: Undergraduate, Mentor: Hope Klug, 2018-2019, The evolution of filial cannibalism and offspring abandonment when offspring mortality is density dependent
681. Chris Cronnon, Level: Undergraduate, Mentor: Hope Klug, 2018-2019, Reproductive behavior of an endangered fish species
682. Zachary Sheckley, Level: Undergraduate, Mentor: Hope Klug, 2018-2019, The link between life history and parental care
683. Destinee Jones, Level: Undergraduate, Mentor: Hope Klug, 2018-2019, Using big data to address complex questions in evolutionary ecology
684. Rebecca Gibbs (née Braswell), Level: Undergraduate, Mentor: Hope Klug, 2018-2019, Making Online Evolution more accessible & animal enrichment at the Chattanooga Nature Center
685. Chelsea Langley, Level: Undergraduate and Post-Bac, Mentor: Hope Klug, 2019-2021, Parental care and sexual selection research
686. Brendell Jones, Level: Undergraduate, Mentor: Ashley Manning-Berg, 2019-2021, Exploring stromatolitic structures in the Knox Group of NW Georgia
687. Hannah Archer, Level: Undergraduate, Mentor: Ashley Manning-Berg, 2019-2021, Experimental silicification of extant microorganisms analogs of Proterozoic microfossils
688. Brianna Taylor, Level: Undergraduate, Mentor: Francesca Leasi, 2019-2021, Research: Tardigrade distribution in the Southeast
689. Jesse Moore, Level: Undergraduate, Mentor: Jodi Caskey, 2019-2021, UHON Thesis: Mentally restorative areas for students: Impacts of nature on psychophysiological state
690. Noura Elsaed, Level: Undergraduate, Mentor: Francesca Leasi, 2020-2021, Individual Studies: Molecular assessment of meiofauna in Hamilton County
691. Jessica Cline, Level: Undergraduate, Mentor: Francesca Leasi, 2020-2022, Honors Thesis: Effects of dissolved and suspended solids on the biodiversity of local freshwater meiofauna
692. Taya deBlonk, Level: Undergraduate and Post-Bac, Mentor: Hope Klug, 2020-2023, Parental care and sexual selection research
693. Isimeme Naomi Udu, Level: Undergraduate and Post-Bac, Mentor: Hope Klug, 2020-2023, Parental care and sexual selection research
694. Ameerah Turner, Level: Undergraduate, Mentor: Ashley Manning-Berg, 2021-2022, Monitoring the effects of bacterial decomposition on coccoidal and filamentous microorganisms to identify changes in decomposition pathways for these microbes
695. Luke Qualey, Level: Undergraduate, Mentor: Francesca Leasi, 2021-2022, Individual Studies: Molecular assessment of meiofauna in Hamilton County
696. Elizabeth Lam, Level: Undergraduate, Mentor: Ashley Manning-Berg, 2021-present, Experimental decomposition of extant microorganisms analogs of Proterozoic microfossils to determine taphonomic morphologies and to identify microbial mat taphonomies through decomposition
697. Evan Ritchey, Level: Undergraduate, Mentor: Ashley Manning-Berg, 2022-2023, Departmental Honors Thesis: Deciphering the paragenetic sequence of the silicified stromatolites of the Knox Group of NW
698. Caden Powers, Level: Undergraduate, Mentor: Ashley Manning-Berg, 2022-2023, Experimental degradation of tires as a way to identify tire particles included in microplastics collected from local streams and rivers
699. Samuel (Madison) Thompson, Level: Undergraduate, Mentor: Ashley Manning-Berg, 2022-2023, Investigating potential algal mat depositions in the Bangor Limestone of Raccoon Mountain at Raccoon Mountain Caverns, Chattanooga, Tennessee

700. Matthew Mollica, Level: Undergraduate, Mentor: Ashley Manning-Berg, 2022-2023, Exploration of the effects of urbanization on surface and cave water in Raccoon Mountain Caverns, Chattanooga, Tennessee
701. Gabrielle Wakefield, Level: Undergraduate, Mentor: Francesca Leasi, 2022-2023, Honors Thesis: Biodiversity shifts in lentic ecosystems
702. Gianni Rasnick, Level: Undergraduate, Mentor: Hope Klug, 2022-2023, Parental care and sexual selection research
703. Carter Jordan, Level: Undergraduate, Mentor: Hope Klug, 2022-2023, Parental care and sexual selection research
704. Julia Mathew, Level: Undergraduate, Mentor: Jannatul Ferdoush, 2022-2023, Understanding the overexpression of transcription factors in cancer cells
705. Selin Kaplanoglu, Level: Undergraduate, Mentor: Jannatul Ferdoush, 2022-present, DHON: Understanding the overexpression of transcription factors in cancer cells
706. Quillen Thornton, Level: Undergraduate, Mentor: Ashley Manning-Berg, 2022-present, 1) Investigating microplastic contamination along wild cave tours and commercial cave tours in Raccoon Mountain Cave. (2) Investigating the source of elevated sulfate concentrations in Raccoon Mountain Cave subsurface waters, Chattanooga, Tennessee
707. Morgan Osborn, Level: Undergraduate, Mentor: Jannatul Ferdoush, 2023-present, DHON: Understanding the overexpression of transcription factors in cancer cells
708. Matthew Ogle, Level: Undergraduate, Mentor: Jannatul Ferdoush, 2023-present, Understanding the overexpression of transcription factors in cancer cells
709. Joud Solaiman, Level: Undergraduate, Mentor: Jannatul Ferdoush, 2023-present, Understanding the overexpression of transcription factors in cancer cells
710. Rizwaan Abdul Karim, Level: Undergraduate, Mentor: Jannatul Ferdoush, 2023-present, Understanding the overexpression of transcription factors in cancer cells
711. Bailey Bashore, Level: Undergraduate, Mentor: Ashley Manning-Berg, 2023-present, Identification and quantification of microplastics collected in stormwater drains during rain events
712. Samantha Doss-Watson, Level: Undergraduate, Mentor: Ashley Manning-Berg, 2023-present, Precipitation of amorphous silica from Proterozoic artificial seawater at low-temperatures and influence of microbial mats

Appendix 4-M Undergraduate Student Presentations

1. Thomas Wiegand, Undergraduate, Mentor: Jennifer Boyd, 2018, Wiegand T, Gentry B, McCoy Z, Odell J, Odell H, Bonsall M, Klug H, Boyd JN. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity. Poster. SoCon Undergraduate Research Forum (SURF). Wofford College, Spartanburg, SC. November 2018.
2. Braley Gentry, Undergraduate, Mentor: Jennifer Boyd, 2018, Wiegand T, Gentry B, McCoy Z, Odell J, Odell H, Bonsall M, Klug H, Boyd JN. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity. Poster. SoCon Undergraduate Research Forum (SURF). Wofford College, Spartanburg, SC. November 2018.
3. Holly Odell, Undergraduate, Mentor: Jennifer Boyd, 2018, Wiegand T, Gentry B, McCoy Z, Odell J, Odell H, Bonsall M, Klug H, Boyd JN. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity. Poster. SoCon Undergraduate Research Forum (SURF). Wofford College, Spartanburg, SC. November 2018.
4. Hao Brooks, Undergraduate, Mentor: DeAnna Beasley, 2018, Brooks, H*, Guzman Hernandez, I*, and Beasley, D.E. (2018). Changes in ant biodiversity across an urban gradient. Association of Southeastern Biologists regional conference, Myrtle Beach, SC.
5. Itzel Guzman Hernandez, Undergraduate, Mentor: DeAnna Beasley, 2018, Guzman Hernandez, I*, Brooks, H*. and Beasley, D.E. (2018). Ant diet preference in urban habitats. Association of Southeastern Biologists regional conference, Myrtle Beach, SC.
6. Kyle Barton, Undergraduate, Mentor: David Giles, 2018, Barton K, Duong A, Harris B, Giles D. Effects of environmental conditions on *Vibrio cholerae* virulence factors in static and continuous culture. UTC Summer Research Symposium. Poster presentation.
7. Rachel Peters, Undergraduate, Mentor: David Giles, 2018, Peters R, Herndon J, Hobby C, Morrow C, Symes SJK and Giles DK. Exogenous fatty acids alter phospholipid composition and influence virulence-associated phenotypes in *Klebsiella pneumoniae*. Association of Southeastern Biologists Meeting. Myrtle Beach, SC. Oral presentation.
8. Rachel Hofer, Undergraduate, Mentor: David Giles, 2018, Hofer R, Symes S and Giles DK. Lipid modification in *Aeromonas salmonicida* through exogenous polyunsaturated fatty acid incorporation. Southeastern Regional Meeting of the ACS (SERMACS). Augusta, GA. Poster Presentation.
9. Jessica Ammon, Undergraduate, Mentor: David Giles, 2018, Ammon J, Smith C, Spratt H, Levine D and Giles DK. Molecular monitoring of methicillin-resistant *Staphylococcus aureus* (MRSA) in a hospital setting: Correlative study of patient and environmental isolates. Association of Southeastern Biologists Meeting. Myrtle Beach, SC. Poster presentation.
10. Emily Lindsay, Undergraduate, Mentor: David Giles, 2018, Lindsay EN and Giles DK. Identification of Genes Involved in Fatty Acid-Mediated Chemotaxis in *Vibrio cholerae*. Association of Southeastern Biologists Meeting. Myrtle Beach, SC. Poster presentation.
11. Joshua Herndon, Undergraduate, Mentor: David Giles, 2018, Herndon JL, Symes SJK and Giles DK. Exogenous polyunsaturated fatty acids (PUFAs) promote changes in growth, phospholipid composition, membrane permeability and virulence phenotypes in *Escherichia coli*. 2018. Association of Southeastern Biologists Meeting. Myrtle Beach, SC. Poster presentation
12. Hayley Beitel, Undergraduate, Mentor: Azad Hossain, 2018, Beitel, H.R., Churnet, H.G., Hossain, A., and Mies, J.W., 2018, Characterization of metamorphic zones in the Tennessee Blue Ridge using GIS and digital image processing, 2018 annual meeting of GSA Southeastern Section. 12–13 April, Knoxville, Tennessee.
13. Hannah Springer, Undergraduate, Mentor: Azad Hossain, 2018, Springer, H. H., and Hossain, A., 2018, Developing a model to map the potential areas for landslide hazards in Hamilton County,

TN using GIS and remote sensing, 2018 annual meeting of GSA Southeastern Section. 12–13 April, Knoxville, Tennessee.

14. William Adair, Undergraduate, Mentor: Azad Hossain, 2018, Adair, W.A., Beitel, H.R., Hamid, Z. A., Hossain, A., and Mies, J.W., 2018, Exploring the potential of remote sensing and GIS for geological mapping of Woodall Shoals, GA-SC, 2018 annual meeting of GSA Southeastern Section. 12–13 April, Knoxville, Tennessee.
15. Hayley Beitel, Undergraduate, Mentor: Azad Hossain, 2018, Adair, W.A., Beitel, H.R., Hamid, Z. A., Hossain, A., and Mies, J.W., 2018, Exploring the potential of remote sensing and GIS for geological mapping of Woodall Shoals, GA-SC, 2018 annual meeting of GSA Southeastern Section. 12–13 April, Knoxville, Tennessee.
16. Z. A. Hamid, Undergraduate, Mentor: Azad Hossain, 2018, Adair, W.A., Beitel, H.R., Hamid, Z. A., Hossain, A., and Mies, J.W., 2018, Exploring the potential of remote sensing and GIS for geological mapping of Woodall Shoals, GA-SC, 2018 annual meeting of GSA Southeastern Section. 12–13 April, Knoxville, Tennessee.
17. Team Salamander, Undergraduate, Mentor: Thomas Wilson, 2018, Hendricks*, T., Team Salamander* and T.P. Wilson. 2018. Comparative Application of Minimally Invasive Identification Methods in *Plethodon dorsalis* and Microhabitat Analysis. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 22, 2018.
18. Thomas Wiegand, Undergraduate, Mentor: Jennifer Boyd, 2019, Wiegand T, Gentry B, McCoy Z, Odell J, Odell H, Bonsall M, Klug H, Boyd JN. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity. Poster. World Congress on Undergraduate Research (WorldCUR). Carl Von Ossietzky Universität, Oldenburg, Germany. May 2019.
19. Braley Gentry, Undergraduate, Mentor: Jennifer Boyd, 2019, Wiegand T, Gentry B, McCoy Z, Odell J, Odell H, Bonsall M, Klug H, Boyd JN. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity. Poster. World Congress on Undergraduate Research (WorldCUR). Carl Von Ossietzky Universität, Oldenburg, Germany. May 2019.
20. Holly Odell, Undergraduate, Mentor: Jennifer Boyd, 2019, Wiegand T, Gentry B, McCoy Z, Odell J, Odell H, Bonsall M, Klug H, Boyd JN. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity. Poster. World Congress on Undergraduate Research (WorldCUR). Carl Von Ossietzky Universität, Oldenburg, Germany. May 2019.
21. Thomas Wiegand, Undergraduate, Mentor: Jennifer Boyd, 2019, Wiegand T, Gentry B, McCoy Z, Odell J, Odell H, Bonsall M, Klug H, Boyd JN. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity. Poster. National Conference on Undergraduate Research (NCUR). Kennesaw State University, Kennesaw, GA. April 2019.
22. Braley Gentry, Undergraduate, Mentor: Jennifer Boyd, 2019, Wiegand T, Gentry B, McCoy Z, Odell J, Odell H, Bonsall M, Klug H, Boyd JN. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity. Poster. National Conference on Undergraduate Research (NCUR). Kennesaw State University, Kennesaw, GA. April 2019.
23. Holly Odell, Undergraduate, Mentor: Jennifer Boyd, 2019, Wiegand T, Gentry B, McCoy Z, Odell J, Odell H, Bonsall M, Klug H, Boyd JN. Visualizing connectivity of ecological and evolutionary concepts with network analysis: an exploration of research on species rarity. Poster. National Conference on Undergraduate Research (NCUR). Kennesaw State University, Kennesaw, GA. April 2019.
24. Caleb Mathias, Undergraduate, Mentor: Amy Brock-Hon, 2019, Mathias, C.A., Spivey, K., Collyer, N., Brock-Hon, A.L., McCarragher, S., 2019. Geology of Chattanooga: Engaging the

Community with its Foundation: Geological Society of America Abstracts with Programs, v. 51, n. 3.

25. Katie Spivey, Undergraduate, Mentor: Amy Brock-Hon, 2019, Mathias, C.A., Spivey, K., Collyer, N., Brock-Hon, A.L., McCarragher, S., 2019. Geology of Chattanooga: Engaging the Community with its Foundation: Geological Society of America Abstracts with Programs, v. 51, n. 3.
26. Aaren Isabel, Undergraduate, Mentor: Fernando Alda, 2019, Isabel A., Alda F. First historical database of exotic freshwater fish species in Tennessee. (Poster presentation). SURF SoCon Undergraduate Research Forum, Spartanburg, SC, USA. November 2nd-3rd 2019.
27. Olivia Morrison, Undergraduate, Mentor: Margaret Kovach, 2019, Morrison, O. & Kovach, M. (2019). The Effects of E-Cigarette Alkaloids on Gene Expression and Cell Viability in Lung Cells. (Poster) National Collegiate Honors Council Conference, New Orleans, LA.
28. Olivia Morrison, Undergraduate, Mentor: Margaret Kovach, 2019, Morrison, O. & Kovach, M. (2019). The Effects of E-Cigarette Alkaloids on Gene Expression and Cell Viability in Lung Cells. (Poster) Southern Conference Undergraduate Research Forum, Spartanburg, SC.
29. Autumn Miller, Undergraduate, Mentor: Francesca Leasi, 2019, Miller A, Leasi F Marine rotifers from the United States. ReSEARCH Dialogues. University of Tennessee at Chattanooga. April 9-10, 2019.
30. Autumn Miller, Undergraduate, Mentor: Francesca Leasi, 2019, Leasi F, Miller A, De Smet M. Effect of salinity and habitat on rotifer communities from the United States and description of two new species. International Meiofauna Conference, Evora, Portugal. July 7-12, 2019.
31. Eric Siv, Undergraduate, Mentor: David Giles, 2019, Siv E, Rojas E, Harris B, Wang J, Giles DK. An Examination of Allee Effects in *Vibrio cholerae*. Association of Southeastern Biologists Meeting. Memphis, TN. Poster presentation.
32. Isabel Gray, Undergraduate, Mentor: David Giles, 2019, Gray I and Giles DK. The search for *Vibrio cholerae* genes involved in fatty acid mediated biofilm formation. Association of Southeastern Biologists Meeting. Memphis, TN. Poster presentation.
33. Kwame Forbes, Undergraduate, Mentor: David Giles, 2019, Forbes K, Alda F, Leasi F, Giles DK. Phylogenetic distribution of exogenous fatty acid acquisition and membrane incorporation proteins in Gram-negative bacteria. UTC Undergraduate Research Poster Symposium in Interdisciplinary Computational Biology (NSF REU Capstone). Chattanooga, TN. Poster Presentation.
34. Jacob Burleson, Undergraduate, Mentor: Azad Hossain, 2019, Burleson, J., York, A., Mathias, C., and Hossain, A., 2019, Exploring the Potential of GIS and Remote Sensing Techniques to Study the Impacts of Drought on Plant-Moisture Content in Hamilton County, Tennessee, 2019 annual meeting of GSA Southeastern Section. 28–29 March, Charleston, South Carolina.
35. Austin York, Undergraduate, Mentor: Azad Hossain, 2019, Burleson, J., York, A., Mathias, C., and Hossain, A., 2019, Exploring the Potential of GIS and Remote Sensing Techniques to Study the Impacts of Drought on Plant-Moisture Content in Hamilton County, Tennessee, 2019 annual meeting of GSA Southeastern Section. 28–29 March, Charleston, South Carolina.
36. Caleb Mathias, Undergraduate, Mentor: Azad Hossain, 2019, Burleson, J., York, A., Mathias, C., and Hossain, A., 2019, Exploring the Potential of GIS and Remote Sensing Techniques to Study the Impacts of Drought on Plant-Moisture Content in Hamilton County, Tennessee, 2019 annual meeting of GSA Southeastern Section. 28–29 March, Charleston, South Carolina.
37. Kenneth Bonnette, Undergraduate, Mentor: Azad Hossain, 2019, Bonnette, K. Firat, C., and Hossain, A., 2019, Application of Remote Sensing Technology to Study Coal Ash Spill in River Water, 2019 annual meeting of GSA Southeastern Section. 28–29 March, Charleston, South Carolina.
38. Connor Firat, Undergraduate, Mentor: Azad Hossain, 2019, Bonnette, K. Firat, C., and Hossain, A., 2019, Application of Remote Sensing Technology to Study Coal Ash Spill in River Water, 2019 annual meeting of GSA Southeastern Section. 28–29 March, Charleston, South Carolina.

39. Stephan Dohse, Undergraduate, Mentor: Azad Hossain, 2019, Dohse, S., Hossain, A., Mies, J., and Jones, K., 2019, Geological Mapping of Woodall Shoals, Ga-Sc Using Remote Sensing and Digital Image Processing techniques, 4th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga.
40. Austin York, Undergraduate, Mentor: Azad Hossain, 2019, York, A., Burleson, J., and Hossain, A., 2019, Investigating the impact of 2016 Southeastern Drought on Vegetation in Hamilton County, TN using GIS and Remote Sensing, 4th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga.
41. Jacob Burleson, Undergraduate, Mentor: Azad Hossain, 2019, York, A., Burleson, J., and Hossain, A., 2019, Investigating the impact of 2016 Southeastern Drought on Vegetation in Hamilton County, TN using GIS and Remote Sensing, 4th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga.
42. William Adair, Undergraduate, Mentor: Azad Hossain, 2019, Hossain, A., Blanton, R., and Adair, W., 2019, Application of Remote Sensing Technology for Surface Water Quality Studies in Southeast Tennessee, 4th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga.
43. Caleb Mathias, Undergraduate, Mentor: Azad Hossain, 2019, Hossain, A., Blanton, R., and Mathias, C., 2019, Quantitative Remote Sensing of Surface Water Quality in Southeast Tennessee. AGU Fall Meeting, 9-13 December 2019, San Francisco, CA.
44. Caleb Mathias, Undergraduate, Mentor: Azad Hossain, 2019, Hossain, A., Blanton, R., and Mathias, C., 2019, Surface Water Quality Monitoring Using Remote Sensing Technology in Chattanooga. SWPBA 46th Annual Meeting in Chattanooga, TN October 14th to 17th, 2019.
45. Caleb Mathias, Undergraduate, Mentor: Azad Hossain, 2019, Hossain, A., Blanton, R., and Mathias, C., 2019, Estimating Surface Water Quality Using Remote Sensing Technology, Research Symposium at Chattanooga State Community College, November 15, 2019.
46. Caleb Mathias, Undergraduate, Mentor: Azad Hossain, 2019, Hossain, A., Blanton, R., and Mathias, C., 2019, 2020, Quantitative Remote Sensing of Surface Water Quality in Southeast Tennessee Utilizing Planet Dove Imagery, 69th Annual Southeastern / 55th Annual Northeastern Section Meeting – 2020, 20-22 March 2020, Reston, Virginia (Abstract accepted). Conference cancelled due to COVID-19.
47. Team Salamander, Undergraduate, Mentor: Thomas Wilson, 2019, Childers*, T., Team Salamander, and T.P. Wilson. 2019. *Plethodon dorsalis*: Microhabitat Analysis and Individual Identification. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 14-17, 2019, Black Mountain, NC.
48. Cullen Harris, Undergraduate, Mentor: Thomas Wilson, 2019, Harris*, C., Team Salamander and T.P. Wilson. 2020. Prevalence of *Ophidiomyces ophidioicola* in Tennessee Snake Populations. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 14-17, 2019, Black Mountain, NC.
49. Team Salamander, Undergraduate, Mentor: Thomas Wilson, 2019, Harris*, C., Team Salamander and T.P. Wilson. 2020. Prevalence of *Ophidiomyces ophidioicola* in Tennessee Snake Populations. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 14-17, 2019, Black Mountain, NC.
50. Team Salamander, Undergraduate, Mentor: Thomas Wilson, 2019, Head*, R, Team Salamander, and T.P. Wilson. 2019. An ongoing assessment of habitat and species richness at Sequatchie Cave at Sequatchie Cave State Natural Area in Marion County, TN National Speleological Society, 2019 Biospeleology Session, Wednesday, June 19th
51. Team Salamander, Undergraduate, Mentor: Thomas Wilson, 2019, Head*, R, Team Salamander, and T.P. Wilson. 2019. An ongoing assessment of habitat and species richness at Sequatchie Cave at Sequatchie Cave State Natural Area in Marion County. The Wildlife Society Annual Meeting, Reno NV, Sept. 29 – Oct. 3, 2019.

52. Diana Lee, Undergraduate, Mentor: Jennifer Boyd, 2020, Rogers, W, Lee D, Platero D, Gentry B, Calles S, Rochford M, Odell J, Anderson JT, Boyd JN, Cruse-Sanders J. Reasons for rarity? Using a common garden approach to investigate the response of rare *Pityopsis ruthii* (Ruth's golden aster) to potential habitat change. Talk. BOTANY. Virtual meeting. August 2020.
53. Derek Platero, Undergraduate, Mentor: Jennifer Boyd, 2020, Rogers, W, Lee D, Platero D, Gentry B, Calles S, Rochford M, Odell J, Anderson JT, Boyd JN, Cruse-Sanders J. Reasons for rarity? Using a common garden approach to investigate the response of rare *Pityopsis ruthii* (Ruth's golden aster) to potential habitat change. Talk. BOTANY. Virtual meeting. August 2020.
54. Braley Gentry, Undergraduate, Mentor: Jennifer Boyd, 2020, Rogers, W, Lee D, Platero D, Gentry B, Calles S, Rochford M, Odell J, Anderson JT, Boyd JN, Cruse-Sanders J. Reasons for rarity? Using a common garden approach to investigate the response of rare *Pityopsis ruthii* (Ruth's golden aster) to potential habitat change. Talk. BOTANY. Virtual meeting. August 2020.
55. Sophia Calles, Undergraduate, Mentor: Jennifer Boyd, 2020, Rogers, W, Lee D, Platero D, Gentry B, Calles S, Rochford M, Odell J, Anderson JT, Boyd JN, Cruse-Sanders J. Reasons for rarity? Using a common garden approach to investigate the response of rare *Pityopsis ruthii* (Ruth's golden aster) to potential habitat change. Talk. BOTANY. Virtual meeting. August 2020.
56. Tiffany Harvey, Undergraduate, Mentor: Fernando Alda, 2020, Harvey T¶, Alda F. Revised phylogenetic hypothesis of Neotropical electric fishes using complete mitochondrial genomes (Poster presentation). National Collegiate Honors Council NCHC20. October 8th-9th2020.
57. Taya de Blonk, Undergraduate, Mentor: Fernando Alda, 2020, De Blonk T¶, Alda F. Assembly and phylogenomic analysis of complete mitochondrial genomes: a comparative study. iCompBio 2020 Summer REU. The University of Tennessee at Chattanooga, Chattanooga TN, USA. July 29th-30th2020
58. W Hooten, Undergraduate, Mentor: Stephanie DeVries, 2020, DeVries, S.L., *Hooten, W. (2020). A C++ tool to estimate land-use impacts on groundwater nitrate concentrations observed at high-capacity pumping wells in an unconfined glacial aquifer." Fall Meeting of the American Geophysical Union.
59. Jacob Burleson, Undergraduate, Mentor: Azad Hossain, 2020, Hossain, A., and Burleson, J., 2020, Developing a model to map the potential areas for landslide hazards in Hamilton County, TN using geospatial technology, 5th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga., April 14-15, 2020. Abstract accepted. Conference cancelled due to COVID-19.
60. Caleb Mathias, Undergraduate, Mentor: Azad Hossain, 2020, Hossain, A., Blanton, R., and Mathias, C., 2020, Surface water quality estimation in Southeast Tennessee using Sentinel - 2 satellite imagery, 5th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga., April 14-15, 2020. Abstract accepted. Conference cancelled due to COVID-19.
61. Caleb Mathias, Undergraduate, Mentor: Azad Hossain, 2020, Mathias, C., and Hossain, A., 2020, Bathymetric Digital Elevation Model for the Tennessee River, 5th Annual UTC Research Dialogue, April 9-10, 2019. The University of Tennessee at Chattanooga., April 14-15, 2020. Abstract accepted. Conference cancelled due to COVID-19.
62. Caleb Mathias, Undergraduate, Mentor: Azad Hossain, 2020, Mathias, C., and Hossain, A., 2020, Developing a Bathymetric Digital Elevation Model for the Tennessee River, Chattanooga Development Symposium 2020, November 10, 2020.
63. Cullen Harris, Undergraduate, Mentor: Thomas Wilson, 2020, Harris*, C. and T.P. Wilson. 2020. Presence and prevalence of *Ophidiomyces ophidiicola* in Tennessee snake populations: an initial assessment. UTC Research Dialogues
64. Team Salamander, Undergraduate, Mentor: Thomas Wilson, 2020, Childers*, T., Team Salamander, and T.P. Wilson. 2020. PLETHODON DORSALIS (COMPLEX): MICROHABITAT ANALYSIS. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 27, 2020.

65. Team Salamander, Undergraduate, Mentor: Thomas Wilson, 2020, Kelehear*, S., Hunt, N., Team Salamander, and T.P. Wilson. 2020. USING GEOSPATIAL ANALYSIS TO MODEL FOR THE CRYPTIC SALAMANDER HEMIDACTYLIUM SCUTATUM IN TENNESSEE. Southeastern Partners in Amphibian and Reptile Conservation Annual Meeting, Poster, February 27, 2020.
66. Jeffrey Yurek, Undergraduate, Mentor: Jennifer Boyd, 2021, Brzyski J, Boyd JN, Cruse-Sanders J, Baskauf C, Anderson J, Yurek J. Are rare species constrained by their acclimatory and evolutionary ability? A congeneric comparison using Echinacea. Talk. Reasons for Rarity Colloquium. Botany 2021. Virtual meeting. July 2021.
67. Tiffany Harvey, Undergraduate, Mentor: Fernando Alda, 2021, Harvey T¶, Alda F. Differential selective pressures in mitochondrial protein coding genes between electric and non-electric fishes. Poster Communication. NCHC Annual Conference, Lake Buena Vista FL, USA. October 27th-31st 2021
68. Tiffany Harvey, Undergraduate, Mentor: Fernando Alda, 2021, Harvey T¶, Alda F. Differential selective pressures in mitochondrial protein coding genes between electric and non-electric fishes. iCompBio 2021 Summer REU. The University of Tennessee at Chattanooga, Chattanooga TN, USA. July 28th-29th 2021.
69. Taya de Blonk, Undergraduate, Mentor: Fernando Alda, 2021, De Blonk T¶*, Wimberly J¶*, Schönhuth S, Neely D, Mayden R, Blum MJ, Alda F. Phylogeography of Stonerollers across North America (Campostoma: Cyprinidae). Poster Communication. UTC ReSEARCH Dialogues. University of Tennessee at Chattanooga, Chattanooga TN, USA. April 12th-14th 2021. *These authors contributed equally to this work.
70. Juliet Wimberly, Undergraduate, Mentor: Fernando Alda, 2021, De Blonk T¶*, Wimberly J¶*, Schönhuth S, Neely D, Mayden R, Blum MJ, Alda F. Phylogeography of Stonerollers across North America (Campostoma: Cyprinidae). Poster Communication. UTC ReSEARCH Dialogues. University of Tennessee at Chattanooga, Chattanooga TN, USA. April 12th-14th 2021. *These authors contributed equally to this work.
71. Lauren Gossett, Undergraduate, Mentor: Stephanie DeVries, 2021, *Gossett, L., and DeVries, S. (2021). Microplastics in the Tennessee River: Are small streams a major source?" GSA Connects 2021, Portland, Oregon, October 12, 2021. Awarded "Best Student Poster" by the Sigma Gamma Epsilon Earth Science Honor Society.
72. W Hooten, Undergraduate, Mentor: Stephanie DeVries, 2021, DeVries, S.L., *Hooten, W. (2021). A C++ tool to estimate land-use impacts on groundwater nitrate concentrations observed at high-capacity pumping wells in an unconfined glacial aquifer." UTC Scholar ReSEARCH Dialogues
73. R B Donaldson, Undergraduate, Mentor: Stephanie DeVries, 2021, *Donaldson, R.B., DeVries, S.L. (2021). A geochemical analysis of acid mine drainage in the Freudenberg Creek Watershed. UTC Scholar ReSEARCH Dialogues.
74. Jessica Cline, Undergraduate, Mentor: Francesca Leasi, 2021, Cline J, Leasi F Effects of dissolved and suspended solids on the biodiversity of freshwater meiofauna from the Tennessee River. 56th National Collegiate Honors Council Annual Conference. Orlando, FL. Oct 27-31, 2021
75. David Smith, Undergraduate, Mentor: David Giles, 2021, Smith D, Houck C, Giles D. Fatty acid-mediated effects on membrane remodeling, virulence phenotypes, and antimicrobial resistance in *Vibrio alginolyticus* and *Vibrio fischeri*. Association of Southeastern Biologists Oral Presentation for Virtual Meeting. Also presented for UTC Research Dialogues.
76. Elizabeth Allen, Undergraduate, Mentor: David Giles, 2021, Allen E, Cotten, M, Giles D. Linoleic acid affects membrane permeability and antimicrobial activity of fish piscidins on *Vibrio cholerae*. Association of Southeastern Biologists Oral Presentation for Virtual Meeting. Also presented for UTC Research Dialogues.
77. Carina Houck, Undergraduate, Mentor: David Giles, 2021, Houck C, Giles D, Cotten M. Fishing for New Antimicrobials: Synergism between Fatty Acids and Piscidin Treatment. Association of

Southeastern Biologists Oral Presentation for Virtual Meeting. Also presented for UTC Research Dialogues.

78. Benjamin House, Undergraduate, Mentor: David Giles, 2021, House BJ, Symes SJ, Giles DK. Exogenous Polyunsaturated Fatty acids (PUFAs) Promote changes in Phospholipid Composition in *Aeromonas salmonicida*. UTC Department of Chemistry and Physics Poster Session.
79. Kayla Redmond, Undergraduate, Mentor: David Giles, 2021, Redmond K, Giles D. Investigating the diversity of Gram negative bacterial fatty acid transport proteins (FadLs) using protein modeling. Undergraduate Research Virtual Symposium in Interdisciplinary Computational Biology (NSF REU Capstone). Chattanooga, TN. Oral Presentation.
80. Caleb Mathias, Undergraduate, Mentor: Azad Hossain, 2021, Hossain, A., and Mathias, C., 2021, Remote Sensing of Water Quality in the Tennessee River Using Sentinel-2 Imagery, GSA Southeastern Section - 70th Annual Meeting – 2021, April 1-2, 2021, Online Meeting. GSA Abstract #362338.
81. Caleb Mathias, Undergraduate, Mentor: Azad Hossain, 2021, Hossain, A. and Mathias, C., 2021, Remote Sensing of Water Quality Using Planet Dove Imagery, 6th Annual UTC Research Dialogue, April 12-15, 2021. The University of Tennessee at Chattanooga.
82. Caleb Mathias, Undergraduate, Mentor: Azad Hossain, 2021, Hossain, A., and Mathias, C., 2021, Remote Sensing of Water Quality in the Tennessee River Using Sentinel-2 Imagery, GSA Southeastern Section - 70th Annual Meeting – 2021, April 1-2, 2021, Online Meeting. GSA Abstract #362338.
83. Annabree Corlew, Undergraduate, Mentor: Jennifer Boyd, 2022, Wiegand T, Corlew A, Rogers W, Cruse-Sanders J, Boyd J. Investigating associations between phenotypic plasticity and geographic distribution in *Helianthus*. Poster. Botany 2022. Anchorage, AK. July 2022.
84. Taya de Blonk, Undergraduate, Mentor: Fernando Alda, 2022, Alda F, de Blonk T¶, Wimberly J¶, Schönhuth S, Neely DA, Mayden RL, Blum MJ. Poster Communication. Joint Meeting of Ichthyologists and Herpetologists, Spokane WA, USA. July 27th-30th2022
85. Juliet Wimberly, Undergraduate, Mentor: Fernando Alda, 2022, Alda F, de Blonk T¶, Wimberly J¶, Schönhuth S, Neely DA, Mayden RL, Blum MJ. Poster Communication. Joint Meeting of Ichthyologists and Herpetologists, Spokane WA, USA. July 27th-30th2022.
86. C Powers, Undergraduate, Mentor: Stephanie DeVries, 2022, *Powers, C., Manning-Berg, A., and DeVries, S. Exploring a potential method to identify and quantify tire particles from other microplastics. GSA Connects 2022, Denver, CO, October 11, 2022.
87. Mollica M, Undergraduate, Mentor: Stephanie DeVries, 2022, *Mollica, M., *Thorton, Q, Manning-Berg, A., and DeVries, S. Assessing anthropogenic effects on water quality in Raccoon Mountain Caverns, Chattanooga, TN. GSA Connects 2022, Denver, CO, October 11, 2022.
88. Thorton Q, Undergraduate, Mentor: Stephanie DeVries, 2022, *Mollica, M., *Thorton, Q, Manning-Berg, A., and DeVries, S. Assessing anthropogenic effects on water quality in Raccoon Mountain Caverns, Chattanooga, TN. GSA Connects 2022, Denver, CO, October 11, 2022.
89. Cole White, Undergraduate, Mentor: Stephanie DeVries, 2022, *White, C., and DeVries, S. (2022). "Transport of colloidal microplastics through porous media," GSA NC/SE Sectional Meeting, Cincinnati, OH, April 7, 2022.
90. Lauren Gossett, Undergraduate, Mentor: Stephanie DeVries, 2022, *Gossett, L., and DeVries, S. (2022). "Microplastics in a small stream: storm response in a tributary to the Tennessee River," GSA NC/SE Sectional Meeting, Cincinnati, OH, April 7, 2022.
91. Ashley Preast, Undergraduate, Mentor: DeAnna Beasley, 2022, Preast, A.* and Beasley, D.E. (2022). Ecosystem function of urban bioretention gardens: A study of decomposition. UTC Research Dialogues.
92. Sydney Gibson, Undergraduate, Mentor: DeAnna Beasley, 2022, Leach, M* and Beasley, D.E. (2022). The use of a mobile weather station in measuring microclimate variation along urban greenways. UTC Research Dialogues.

93. Noura Elsaheed, Undergraduate, Mentor: Francesca Leasi, 2022, Leasi F, Cline J, Elsaheed N, Qualey L. First report of meiofauna biodiversity from the Tennessee River. 83rd Annual Meeting of Association of Southeastern Biologists. Little Rock (AK). March 30 - April 2, 2022.
94. Luke Qualey, Undergraduate, Mentor: Francesca Leasi, 2022, Leasi F, Cline J, Elsaheed N, Qualey L. First report of meiofauna biodiversity from the Tennessee River. 83rd Annual Meeting of Association of Southeastern Biologists. Little Rock (AK). March 30 - April 2, 2022.
95. Jessica Cline, Undergraduate, Mentor: Francesca Leasi, 2022, Leasi F, Cline J, Elsaheed N, Qualey L. First report of meiofauna biodiversity from the Tennessee River. 83rd Annual Meeting of Association of Southeastern Biologists. Little Rock (AK). March 30 - April 2, 2022.
96. Jessica Cline, Undergraduate, Mentor: Francesca Leasi, 2022, Cline J, Leasi F. The Effects of Dissolved and Suspended Solids on Freshwater Meiofauna. ReSEARCH Dialogues. University of Tennessee at Chattanooga. April 12-13, 2022.
97. Noura Elsaheed, Undergraduate, Mentor: Francesca Leasi, 2022, Leasi F, Cline J, Elsaheed N, Qualey L. First report of meiofauna biodiversity from the Tennessee River. ReSEARCH Dialogues. University of Tennessee at Chattanooga. April 12-13, 2022.
98. Luke Qualey, Undergraduate, Mentor: Francesca Leasi, 2022, Leasi F, Cline J, Elsaheed N, Qualey L. First report of meiofauna biodiversity from the Tennessee River. ReSEARCH Dialogues. University of Tennessee at Chattanooga. April 12-13, 2022.
99. Jessica Cline, Undergraduate, Mentor: Francesca Leasi, 2022, Leasi F, Cline J, Elsaheed N, Qualey L. First report of meiofauna biodiversity from the Tennessee River. ReSEARCH Dialogues. University of Tennessee at Chattanooga. April 12-13, 2022.
100. Benjamin House, Undergraduate, Mentor: David Giles, 2022, House B, Giles D, Symes S. Quantifying the Uptake of Exogenous PUFAs in *Vibrio cholerae*. UTC Chemistry and Physics Undergraduate Research Program. Oral presentation.
101. Olivia Chester, Undergraduate, Mentor: David Giles, 2022, Chester O, Giles DK. The Effects of Polyunsaturated Fatty Acids in the Presence of Piscidins on *Vibrio cholerae*. Association of Southeastern Biologists Annual Meeting. Little Rock, AR. Also presented at UTC Research Dialogues. Poster presentation.
102. Naina Patel, Undergraduate, Mentor: David Giles, 2022, Patel N, Giles DK. Polyunsaturated fatty acids affect membrane permeability and antimicrobial activity of polymyxin B and colistin on *Vibrio cholerae*. Association of Southeastern Biologists Annual Meeting. Little Rock, AR. Also presented at UTC Research Dialogues. Poster presentation.
103. Shleby Campbell, Undergraduate, Mentor: Azad Hossain, 2022, Hossain, A., Campbell, S., and Mies, J., 2022, Investigating Seasonal Variation of Urban Heat Island Effect in the City of Chattanooga, TN Using Remote Sensing, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
104. Shleby Campbell, Undergraduate, Mentor: Azad Hossain, 2022, Campbell, S., and Hossain, A., 2022, Application of Remote Sensing to Study the Potential Impact of 2020 Wildfire Events on the Glaciers of Mount Baker, Washington, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
105. Abbie Faxon, Undergraduate, Mentor: Azad Hossain, 2022, Faxon, A., Hossain, A., Mies, J., and Shirmeen, T., 2022, Studying Suspended Sediment Concentrations in the South Chickamauga Creek using Satellite Imagery and Numeric Modeling, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
106. Abbie Faxon, Undergraduate, Mentor: Azad Hossain, 2022, Faxon, A., Hossain, A., Mies, J., and Shirmeen, T., 2022, Studying Suspended Sediment Concentrations in the South Chickamauga Creek of Chattanooga, TN using Satellite Imagery, Digital Image Processing, and Numeric Modeling. NCUR 2022 @Home on April 4-8, 2022.
107. William Bordash, Undergraduate, Mentor: Azad Hossain, 2022, Bordash, W., Hossain, A., and Mies, J., 2022, Remote Sensing of Volcanic Eruption Characteristics in the Galapagos Islands, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.

108. Braxton Anzalone, Undergraduate, Mentor: Azad Hossain, 2022, Anzalone, B., and Hossain, A., 2022, Evaluating the Performance of NDSSI, NDTI, and NSMI in the Tennessee River Using Ground Measurements of Turbidity, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
109. Hannah Bowman, Undergraduate, Mentor: Azad Hossain, 2022, Bowman, H., Hossain, A., Breetzke, D., 2022, Application of Geospatial Technology to Map the Potential Locations of Chert in the Daniel Boone National Forest, Kentucky, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
110. Matthew Mollica, Undergraduate, Mentor: Azad Hossain, 2022, Mollica, M., and Hossain, A., 2022, Spatio-temporal Analysis of Snowpack on the Rocky Mountains Using GIS, ASPRS 2022 Annual Conference, Virtual, March 21-25, 2022.
111. Shleby Campbell, Undergraduate, Mentor: Azad Hossain, 2022, Hossain, A., Campbell, S., and Mies, J., 2022, Urban Heat Island Effect in the City of Chattanooga, TN, UTC Research Dialogues 2022, April 12-13, 2022.
112. Jacob Burleson, Undergraduate, Mentor: Azad Hossain, 2022, Hossain, A., Burleson, J., Springer, H., Welborn, R., and Mies, J., 2022, Landslide Hazards in Hamilton County, TN, UTC Research Dialogues 2022, April 12-13, 2022.
113. Shleby Campbell, Undergraduate, Mentor: Azad Hossain, 2022, Campbell, S., and Hossain, A., 2022, Application of Remote Sensing to Study the Potential Impact of Wildfire on Glaciers, UTC Research Dialogues 2022, April 12-13, 2022.
114. Abbie Faxon, Undergraduate, Mentor: Azad Hossain, 2022, Faxon, A., Hossain, A., Mies, J., and Shirmeen, T., 2022, Evaluating the Performance of PlanetScope Imagery to Study Suspended Sediment Concentrations in the South Chickamauga Creek of Chattanooga, TN, UTC Research Dialogues 2022, April 12-13, 2022.
115. Braxton Anzalone, Undergraduate, Mentor: Azad Hossain, 2022, Anzalone, B., and Hossain, A., 2022, Mapping Relative Variation of Suspended Sediment Concentration in the Tennessee River Using Remote Sensing, UTC Research Dialogues 2022, April 12-13, 2022.
116. Carmen Harvey, Undergraduate, Mentor: Thomas Wilson, 2022, Jejal Reddy Bathi, Carmen Harvey, Ignatius Fomunung, Mbakisya Onyango, M.K.H. Sabbir, Yu Liang, and Thomas Wilson. 2022. Database of Green Infrastructure in Transportation Projects Planning: Current Guidance and Standards by Transportation Agencies, The Transportation Research Board (TRB) 102nd Annual Meeting, Washington, D.C , USA (2022)
117. Team Salamander, Undergraduate, Mentor: Thomas Wilson, 2022, Cobb*, N.R., Hunt, N.R. Team Salamander*, and T.P. Wilson. 2022. Green Salamander (*Aneides aeneus*) Abundance and Proximity to Hiking Trails in the Greater Chattanooga Area. Annual Meeting-
118. Association of Southeastern Biologists, Little Rock AR.
119. Team Salamander, Undergraduate, Mentor: Thomas Wilson, 2022, Gaylord*, E. M., Hunt, N.R., Team Salamander*, and T. P. Wilson. 2022. Developing a Predictive Geospatial Habitat Model for Green Salamanders (*Aneides aeneus*) in East Tennessee. Annual Meeting- Association of Southeastern Biologists, Little Rock AR.
120. Team Salamander, Undergraduate, Mentor: Thomas Wilson, 2022, Jeremiah Rhodes, Nyssal Hunt, Team Salamander and Thomas Wilson. 2022. Comparing Anuran Diversity and Abundance in Natural and Artificial Wetlands in Tennessee. UTC Research Dialogues.
121. Amber Newbille, Undergraduate, Mentor: Amy Brock-Hon, 2023, Newbille, A., Anzalone, B., Powers, C., Qualls, H., Thomas, S., Brock-Hon, A., Hon, K., McCarragher, S., Meese, P., 2023. Investigation of the morphology of a large sandstone depression on the Cumberland Plateau of Tennessee using geomorphic mapping and GPR
122. Braxton Anzalone, Undergraduate, Mentor: Amy Brock-Hon, 2023, Newbille, A., Anzalone, B., Powers, C., Qualls, H., Thomas, S., Brock-Hon, A., Hon, K., McCarragher, S., Meese, P., 2023. Investigation of the morphology of a large sandstone depression on the Cumberland Plateau of Tennessee using geomorphic mapping and GPR

123. Caden Powers, Undergraduate, Mentor: Amy Brock-Hon, 2023, Newbille, A., Anzalone, B., Powers, C., Qualls, H., Thomas, S., Brock-Hon, A., Hon, K., McCarragher, S., Meese, P., 2023. Investigation of the morphology of a large sandstone depression on the Cumberland Plateau of Tennessee using geomorphic mapping and GPR
124. Heather Qualls, Undergraduate, Mentor: Amy Brock-Hon, 2023, Newbille, A., Anzalone, B., Powers, C., Qualls, H., Thomas, S., Brock-Hon, A., Hon, K., McCarragher, S., Meese, P., 2023. Investigation of the morphology of a large sandstone depression on the Cumberland Plateau of Tennessee using geomorphic mapping and GPR
125. Sera Thomas, Undergraduate, Mentor: Amy Brock-Hon, 2023, Newbille, A., Anzalone, B., Powers, C., Qualls, H., Thomas, S., Brock-Hon, A., Hon, K., McCarragher, S., Meese, P., 2023. Investigation of the morphology of a large sandstone depression on the Cumberland Plateau of Tennessee using geomorphic mapping and GPR
126. Julia Mathew, Undergraduate, Mentor: Jannatul Ferdoush, 2023, Mathew J. and Ferdoush J. (2023). Understanding the overexpression of TAF12 in cancer cell. UTC SPRING RESEARCH AND ARTS CONFERENCE
127. Morgan Osborn, Undergraduate, Mentor: Jannatul Ferdoush, 2023, Osborn M. and Ferdoush J. (2023). Elucidation of the upregulation of TAF2 (TATA-Box Binding Protein Associated Factor 2) in cancer cell. UTC SPRING RESEARCH AND ARTS CONFERENCE
128. Gabrielle Wakefield, Undergraduate, Mentor: Francesca Leasi, 2023, Wakefield G, Bryant K, Leasi F. Preserving lentic freshwater biodiversity in Hamilton County: an assessment of anthropogenic impacts and conservation strategies. Spring Research and Arts Conference. University of Tennessee at Chattanooga. April 12, 2023.
129. Kyle Bryant, Undergraduate, Mentor: Francesca Leasi, 2023, Wakefield G, Bryant K, Leasi F. Preserving lentic freshwater biodiversity in Hamilton County: an assessment of anthropogenic impacts and conservation strategies. Spring Research and Arts Conference. University of Tennessee at Chattanooga. April 12, 2023.
130. Patrick Basham, Undergraduate, Mentor: Azad Hossain, 2023, Bassham, P., Stein, J., Cox, M., and Hossain, A., 2023, Tree Canopy & Impervious Surface Coverage Change on Signal Mountain and Walden from 2010-2021, ASPRS 2023 International Technical Symposium, June 12-16, 2023, Virtual.
131. Jared Stein, Undergraduate, Mentor: Azad Hossain, 2023, Bassham, P., Stein, J., Cox, M., and Hossain, A., 2023, Tree Canopy & Impervious Surface Coverage Change on Signal Mountain and Walden from 2010-2021, ASPRS 2023 International Technical Symposium, June 12-16, 2023, Virtual.
132. Morris Cox, Undergraduate, Mentor: Azad Hossain, 2023, Bassham, P., Stein, J., Cox, M., and Hossain, A., 2023, Tree Canopy & Impervious Surface Coverage Change on Signal Mountain and Walden from 2010-2021, ASPRS 2023 International Technical Symposium, June 12-16, 2023, Virtual.
133. Breann Larson, Undergraduate, Mentor: Azad Hossain, 2023, Hossain, A., and Larson, B., 2023, Spatio-Temporal Analysis of Suspended Sediment Concentration in Lake Pontchartrain Using Remote Sensing, ASPRS 2023 International Technical Symposium, June 12-16, 2023, Virtual.
134. Breann Larson, Undergraduate, Mentor: Azad Hossain, 2023, Larson, B. and Hossain, A., 2023, Qualitative Analysis of Algal Blooms in Lake Pontchartrain Using Remote Sensing, ASPRS Mid-South Conference 2023, April 21, 2023, Oak Ridge National Laboratory, Knoxville, TN.
135. Michelle White, Undergraduate, Mentor: Thomas Wilson, 2023, Michelle D. White, Nicole Cobb, Miranda Lighter, Autumn Love, and Thomas Wilson. 2023. Recommending Manual Frog Call Surveys to Monitor Weather Climate Phenomena at UTC: A Student-Centered Approach. UTC Research and Arts Conference

136. Miranda Lighter, Undergraduate, Mentor: Thomas Wilson, 2023, Michelle D. White, Nicole Cobb, Miranda Lighter, Autumn Love, and Thomas Wilson. 2023. Recommending Manual Frog Call Surveys to Monitor Weather Climate Phenomena at UTC: A Student-Centered Approach. UTC Research and Arts Conference
137. Autumn Love, Undergraduate, Mentor: Thomas Wilson, 2023, Michelle D. White, Nicole Cobb, Miranda Lighter, Autumn Love, and Thomas Wilson. 2023. Recommending Manual Frog Call Surveys to Monitor Weather Climate Phenomena at UTC: A Student-Centered Approach. UTC Research and Arts Conference
138. Austin Stitner, Undergraduate, Mentor: Thomas Wilson, 2023, Crystal Allen, Austin Stitner, Katie Hemauer, Morgan Griffin, and Thomas Wilson. 2023. Prevalent Amphibian Diseases of the Southeastern United States & How Humans Can Minimize Their Transmission. UTC Research and Arts Conference
139. Katie Hemauer, Undergraduate, Mentor: Thomas Wilson, 2023, Crystal Allen, Austin Stitner, Katie Hemauer, Morgan Griffin, and Thomas Wilson. 2023. Prevalent Amphibian Diseases of the Southeastern United States & How Humans Can Minimize Their Transmission. UTC Research and Arts Conference
140. Morgan Griffin, Undergraduate, Mentor: Thomas Wilson, 2023, Crystal Allen, Austin Stitner, Katie Hemauer, Morgan Griffin, and Thomas Wilson. 2023. Prevalent Amphibian Diseases of the Southeastern United States & How Humans Can Minimize Their Transmission. UTC Research and Arts Conference
141. Imani Gardner, Undergraduate, Mentor: Thomas Wilson, 2023, Imani Gardner, Nelson Goodman, Hunter Smith, Dominick Hazeltine, and Thomas Wilson. 2023. Atrazine! Why So Mean? Atrazine as a Stressor to Frog Reproduction and Life History. UTC Research and Arts Conference
142. Dominick Hazeltine, Undergraduate, Mentor: Thomas Wilson, 2023, Imani Gardner, Nelson Goodman, Hunter Smith, Dominick Hazeltine, and Thomas Wilson. 2023. Atrazine! Why So Mean? Atrazine as a Stressor to Frog Reproduction and Life History. UTC Research and Arts Conference
143. Seth Little, Undergraduate, Mentor: Thomas Wilson, 2023, Seth Little, Brianna Millican, Emma Madewell, and Thomas Wilson. 2023. Amphibian Pet Trade Affecting Appalachian Mountain Biodiversity: A Public Service Announcement. UTC Research and Arts Conference
144. Emma Madewell, Undergraduate, Mentor: Thomas Wilson, 2023, Seth Little, Brianna Millican, Emma Madewell, and Thomas Wilson. 2023. Amphibian Pet Trade Affecting Appalachian Mountain Biodiversity: A Public Service Announcement. UTC Research and Arts Conference
145. Carter Woehlert, Undergraduate, Mentor: Thomas Wilson, 2023, Avriel Null, Carter Cook, Nicholas Myers, and Thomas Wilson. 2023. Effects Of Introduced Predatory Fish Species On Amphibian Populations: A Literature Review. UTC Research and Arts Conference
146. Nicholas Myers, Undergraduate, Mentor: Thomas Wilson, 2023, Avriel Null, Carter Cook, Nicholas Myers, and Thomas Wilson. 2023. Effects Of Introduced Predatory Fish Species On Amphibian Populations: A Literature Review. UTC Research and Arts Conference
147. James Zach Anderson, Undergraduate, Mentor: Thomas Wilson, 2023, Rachel Rose, Hannah Fallon, James Anderson, Micheal Fava, Juliana Mynatt, and Thomas Wilson. 2023. Gaps in Current Wetland Mitigation Policies for Southern Appalachian Amphibians. UTC Research and Arts Conference
148. Micheal Fava, Undergraduate, Mentor: Thomas Wilson, 2023, Rachel Rose, Hannah Fallon, James Anderson, Micheal Fava, Juliana Mynatt, and Thomas Wilson. 2023. Gaps in Current Wetland Mitigation Policies for Southern Appalachian Amphibians. UTC Research and Arts Conference
149. Juliana Mynat, Undergraduate, Mentor: Thomas Wilson, 2023, Rachel Rose, Hannah Fallon, James Anderson, Micheal Fava, Juliana Mynatt, and Thomas Wilson. 2023. Gaps in

Current Wetland Mitigation Policies for Southern Appalachian Amphibians. UTC Research and Arts Conference

Appendix 4-N Undergraduate Student Publications

1. Reed Boeger, Undergraduate, Mentor: David Giles, 2018, Turgeson, A., R. Boeger, D. K. Giles and B. Harris. 2018. Introducing biochemistry and cellular biology to chemical engineering students by cultivating a bacterial pathogen in a bioreactor. American Society for Engineering Education-Southeastern Section 2018 Conference Proceedings.
2. Lyssa Baker, Undergraduate, Mentor: David Giles, 2018, Baker, L. Y., C. R. Hobby, A. W. Siv, W. C. Bible, M. S. Glennon, D. M. Anderson, S. J. Symes and D. K. Giles. 2018. *Pseudomonas aeruginosa* responds to exogenous polyunsaturated fatty acids (PUFAs) by modifying phospholipid composition, membrane permeability, and phenotypes associated with virulence. BMC Microbiology 18:117. doi: 10.1186/s12866-018-1259-9
3. Chelsea Hobby, Undergraduate, Mentor: David Giles, 2018, Baker, L. Y., C. R. Hobby, A. W. Siv, W. C. Bible, M. S. Glennon, D. M. Anderson, S. J. Symes and D. K. Giles. 2018. *Pseudomonas aeruginosa* responds to exogenous polyunsaturated fatty acids (PUFAs) by modifying phospholipid composition, membrane permeability, and phenotypes associated with virulence. BMC Microbiology 18:117. doi: 10.1186/s12866-018-1259-10
4. Andrew Siv, Undergraduate, Mentor: David Giles, 2018, Baker, L. Y., C. R. Hobby, A. W. Siv, W. C. Bible, M. S. Glennon, D. M. Anderson, S. J. Symes and D. K. Giles. 2018. *Pseudomonas aeruginosa* responds to exogenous polyunsaturated fatty acids (PUFAs) by modifying phospholipid composition, membrane permeability, and phenotypes associated with virulence. BMC Microbiology 18:117. doi: 10.1186/s12866-018-1259-11
5. William Bible, Undergraduate, Mentor: David Giles, 2018, Baker, L. Y., C. R. Hobby, A. W. Siv, W. C. Bible, M. S. Glennon, D. M. Anderson, S. J. Symes and D. K. Giles. 2018. *Pseudomonas aeruginosa* responds to exogenous polyunsaturated fatty acids (PUFAs) by modifying phospholipid composition, membrane permeability, and phenotypes associated with virulence. BMC Microbiology 18:117. doi: 10.1186/s12866-018-1259-12
6. Michael Glennon, Undergraduate, Mentor: David Giles, 2018, Baker, L. Y., C. R. Hobby, A. W. Siv, W. C. Bible, M. S. Glennon, D. M. Anderson, S. J. Symes and D. K. Giles. 2018. *Pseudomonas aeruginosa* responds to exogenous polyunsaturated fatty acids (PUFAs) by modifying phospholipid composition, membrane permeability, and phenotypes associated with virulence. BMC Microbiology 18:117. doi: 10.1186/s12866-018-1259-13
7. Sarah Morgenthaler, Undergraduate, Mentor: Amy Brock-Hon, 2019, Investigation of limestone and dolomite clast alteration in petrocalcic horizons, southern Nevada, USA: Geoderma, v. 342, p. 42-54.
8. Hannah Hightower, Undergraduate, Mentor: Stylianos Chatzimanolis, 2019, Chatzimanolis, S and H. J. Hightower. 2019. *Peripus*, a new genus of Xanthopygina (Coleoptera: Staphylinidae) from South America. Zootaxa: 4648(2): 371-383
9. Anna Collier, Undergraduate, Mentor: David Giles, 2019, Spratt, H. G., D. Levine, J. Bage, D. K. Giles and A.G. Collier. 2019. Topical lotions utilized in outpatient rehabilitation clinics as a potential source of bacterial contamination. Physiotherapy Theory and Practice. 35:163-170.
10. Chelsea Hobby, Undergraduate, Mentor: David Giles, 2019, Hobby, C. R., J. L. Herndon, C. A. Morrow, S. J. K. Symes and D. K. Giles. 2019. Exogenous fatty acids alter phospholipid composition, membrane permeability, capacity for biofilm formation and antimicrobial peptide susceptibility in *Klebsiella pneumoniae*. MicrobiologyOpen: e00635.
11. Joshua Herndon, Undergraduate, Mentor: David Giles, 2019, Hobby, C. R., J. L. Herndon, C. A. Morrow, S. J. K. Symes and D. K. Giles. 2019. Exogenous fatty acids alter phospholipid composition, membrane permeability, capacity for biofilm formation and antimicrobial peptide susceptibility in *Klebsiella pneumoniae*. MicrobiologyOpen: e00635.
12. Colton Morrow, Undergraduate, Mentor: David Giles, 2019, Hobby, C. R., J. L. Herndon, C. A. Morrow, S. J. K. Symes and D. K. Giles. 2019. Exogenous fatty acids alter phospholipid

composition, membrane permeability, capacity for biofilm formation and antimicrobial peptide susceptibility in *Klebsiella pneumoniae*. *MicrobiologyOpen*: e00635.

13. Thomas Wiegand, Undergraduate, Mentor: Jennifer Boyd, 2020, Wiegand T.P., Gentry B., McCoy Z., Tannis C., Klug H., Bonsall M.B., Boyd J.N. 2020. Visualizing connectivity of ecological and evolutionary concepts – an exploration of research on plant species rarity. *Ecology and Evolution* 10: 9037-90447. DOI: 10.1002/ece3.6633
14. Braley Gentry, Undergraduate, Mentor: Jennifer Boyd, 2020, Wiegand T.P., Gentry B., McCoy Z., Tannis C., Klug H., Bonsall M.B., Boyd J.N. 2020. Visualizing connectivity of ecological and evolutionary concepts – an exploration of research on plant species rarity. *Ecology and Evolution* 10: 9037-90447. DOI: 10.1002/ece3.6633
15. Hannah Hightower, Undergraduate, Mentor: Stylianos Chatzimanolis, 2020, Chatzimanolis, S, W. G. Cofer, H. J. Hightower, M. K. Roy and J. L. Sanders. 2020. New records of beetles (Coleoptera) from the Tennessee Valley of Southeastern USA. *The Coleopterists Bulletin* 74(3): 605-618.
16. William Cofer, Undergraduate, Mentor: Stylianos Chatzimanolis, 2020, Chatzimanolis, S, W. G. Cofer, H. J. Hightower, M. K. Roy and J. L. Sanders. 2020. New records of beetles (Coleoptera) from the Tennessee Valley of Southeastern USA. *The Coleopterists Bulletin* 74(3): 605-618.
17. Megan Roy, Undergraduate, Mentor: Stylianos Chatzimanolis, 2020, Chatzimanolis, S, W. G. Cofer, H. J. Hightower, M. K. Roy and J. L. Sanders. 2020. New records of beetles (Coleoptera) from the Tennessee Valley of Southeastern USA. *The Coleopterists Bulletin* 74(3): 605-618.
18. Elizabeth Plunk, Undergraduate, Mentor: Sean Richards, 2020, Plunk EC*, Richards SM. Endocrine-Disrupting Air Pollutants and Their Effects on the Hypothalamus-Pituitary-Gonadal Axis. *International Journal of Molecular Sciences*. 2020; 21(23):9191. <https://doi.org/10.3390/ijms21239191>
19. Joshua Herndon, Undergraduate, Mentor: David Giles, 2020, Herndon J. L., R. E. Peters, R. N. Hofer, T. B. Simmons, S. J. K. Symes and D. K. Giles. 2020. Exogenous polyunsaturated fatty acids (PUFAs) promote changes in growth, phospholipid composition, membrane permeability and virulence phenotypes in *Escherichia coli*. *BMC Microbiol.* 20:305. doi: 10.1186/s12866-020-01988-0
20. Rachel Peters, Undergraduate, Mentor: David Giles, 2020, Herndon J. L., R. E. Peters, R. N. Hofer, T. B. Simmons, S. J. K. Symes and D. K. Giles. 2020. Exogenous polyunsaturated fatty acids (PUFAs) promote changes in growth, phospholipid composition, membrane permeability and virulence phenotypes in *Escherichia coli*. *BMC Microbiol.* 20:305. doi: 10.1186/s12866-020-01988-1
21. Rachel Hofer, Undergraduate, Mentor: David Giles, 2020, Herndon J. L., R. E. Peters, R. N. Hofer, T. B. Simmons, S. J. K. Symes and D. K. Giles. 2020. Exogenous polyunsaturated fatty acids (PUFAs) promote changes in growth, phospholipid composition, membrane permeability and virulence phenotypes in *Escherichia coli*. *BMC Microbiol.* 20:305. doi: 10.1186/s12866-020-01988-2
22. Timothy Simmons, Undergraduate, Mentor: David Giles, 2020, Herndon J. L., R. E. Peters, R. N. Hofer, T. B. Simmons, S. J. K. Symes and D. K. Giles. 2020. Exogenous polyunsaturated fatty acids (PUFAs) promote changes in growth, phospholipid composition, membrane permeability and virulence phenotypes in *Escherichia coli*. *BMC Microbiol.* 20:305. doi: 10.1186/s12866-020-01988-3
23. Jessica White, Undergraduate, Mentor: Jonathan Mies, 2021, *Mies, J. W. and White, Jessica (student), 2021, The arcuate geometry of Onslow Bay, North Carolina, its influence on hurricane-induced microseisms, and potential relations to coastal processes, *Geological Society of America Abstracts with Programs*, v. 53, n. 6, doi: 10.1130/abs/2021AM-365017.
24. Jaida Hopkins, Undergraduate, Mentor: Sean Richards, 2021, *Hopkins, Jaida, Sweck, Samantha*, Richards, Sean. "The Diagnosis, Clinical Course, Treatment, and Prevention of the Rabies Virus" In *Rabies Virus at the Beginning of 21st Century*, edited by Sergey Tkachev.

London: IntechOpen, 2021. 10.5772/intechopen.97691. Available from:
<https://www.intechopen.com/online-first/76642>

25. Samantha Sweck, Undergraduate, Mentor: Sean Richards, 2021, *Hopkins, Jaida, Sweck, Samantha*, Richards, Sean. "The Diagnosis, Clinical Course, Treatment, and Prevention of the Rabies Virus" In Rabies Virus at the Beginning of 21st Century, edited by Sergey Tkachev. London: IntechOpen, 2021. 10.5772/intechopen.97691. Available from:
<https://www.intechopen.com/online-first/76642>
26. Jaida Hopkins, Undergraduate, Mentor: Sean Richards, 2021, *Chambers, Weston S., Jaida G. Hopkins*, and Sean M. Richards. 2021. A Review of Per-and Polyfluorinated Alkyl Substance (PFAS) Impairment of Reproduction. *Frontiers in Toxicology*: Vol 3.
<https://doi.org/10.3389/ftox.2021.732436>
27. Weston Chambers, Undergraduate, Mentor: Sean Richards, 2021, *Chambers, Weston S., Jaida G. Hopkins*, and Sean M. Richards. 2021. A Review of Per-and Polyfluorinated Alkyl Substance (PFAS) Impairment of Reproduction. *Frontiers in Toxicology*: Vol 3.
<https://doi.org/10.3389/ftox.2021.732436>
28. Dakila Ledesma, Undergraduate, Mentor: Sean Richards, 2021, Ledesma D*, Symes S, Richards S. Advancements within modern machine learning methodology: Impacts and prospects for biomarker discovery. *Current Medicinal Chemistry*. 2021 Feb. DOI:
10.2174/0929867328666210208111821.
29. David Smith, Undergraduate, Mentor: David Giles, 2021, Smith D. S., C. Houck, A. Lee, T. B. Simmons, O. N. Chester, A. Esdaile, S. J. K. Symes and D. K. Giles. 2021. Polyunsaturated fatty acids cause physiological and behavioral changes in *Vibrio alginolyticus* and *Vibrio fischeri*. *Microbiologyopen* 10:e1237. doi: 10.1002/mbo3.1237.
30. Carina Houck, Undergraduate, Mentor: David Giles, 2021, Smith D. S., C. Houck, A. Lee, T. B. Simmons, O. N. Chester, A. Esdaile, S. J. K. Symes and D. K. Giles. 2021. Polyunsaturated fatty acids cause physiological and behavioral changes in *Vibrio alginolyticus* and *Vibrio fischeri*. *Microbiologyopen* 10:e1237. doi: 10.1002/mbo3.1237.
31. Timothy Simmons, Undergraduate, Mentor: David Giles, 2021, Smith D. S., C. Houck, A. Lee, T. B. Simmons, O. N. Chester, A. Esdaile, S. J. K. Symes and D. K. Giles. 2021. Polyunsaturated fatty acids cause physiological and behavioral changes in *Vibrio alginolyticus* and *Vibrio fischeri*. *Microbiologyopen* 10:e1237. doi: 10.1002/mbo3.1237.
32. Olivia Chester, Undergraduate, Mentor: David Giles, 2021, Smith D. S., C. Houck, A. Lee, T. B. Simmons, O. N. Chester, A. Esdaile, S. J. K. Symes and D. K. Giles. 2021. Polyunsaturated fatty acids cause physiological and behavioral changes in *Vibrio alginolyticus* and *Vibrio fischeri*. *Microbiologyopen* 10:e1237. doi: 10.1002/mbo3.1237.
33. Ayanna Esdaile, Undergraduate, Mentor: David Giles, 2021, Smith D. S., C. Houck, A. Lee, T. B. Simmons, O. N. Chester, A. Esdaile, S. J. K. Symes and D. K. Giles. 2021. Polyunsaturated fatty acids cause physiological and behavioral changes in *Vibrio alginolyticus* and *Vibrio fischeri*. *Microbiologyopen* 10:e1237. doi: 10.1002/mbo3.1237.
34. Caleb Mathias, Undergraduate, Mentor: Azad Hossain, 2021, Hossain, A. Mathias, C. and Blanton, R., 2021, Remote Sensing of Turbidity in the Tennessee River Using Landsat 8 Satellite, *Remote Sensing*, 2021, 13, 3785. <https://doi.org/10.3390/rs13183785>.
35. William Stuart, Undergraduate, Mentor: Azad Hossain, 2021, Hossain, A., Stuart, W., Mies, J., and Brock-Hon, A., 2021, Investigating Urban Heat Island (UHI) Impact for the City of Chattanooga, Tennessee Using GIS and Remote Sensing, in "Handbook of Climate Change Mitigation and Adaptation", Maximilian Lackner MBA. (editor), Springer International Publishing. https://doi.org/10.1007/978-1-4614-6431-0_136-1.
36. Tabitha Wilson, Undergraduate, Mentor: Thomas Wilson, 2021, Wilson, T. P., Reynolds, B.R., Nyok P., Chauhun, R., Wilson, P. J., Wilson, T. M., and Team Salamander. 2021. Turtles All the Way Down: An Update on the Asian Turtle Crisis with New Directions. *Education about Asia* 26(1), 28-33.

37. Team Salamander, Undergraduate, Mentor: Thomas Wilson, 2021, Wilson, T. P., Reynolds, B.R., Nyok P., Chauhun, R., Wilson, P. J., Wilson, T. M., and Team Salamander. 2021. Turtles All the Way Down: An Update on the Asian Turtle Crisis with New Directions. *Education about Asia* 26(1), 28-33.
38. Weston Chambers, Undergraduate, Mentor: Sean Richards, 2022, Elizabeth C. Plunk*, Weston S. Chambers*, and Sean M. Richards. 2022. *Systems Biology In Metabolomics Perspectives, From Theory to Practical Application*. Elsevier. Pages 3-25. 1st Edition - April 1, 2022
39. Elizabeth Plunk, Undergraduate, Mentor: Sean Richards, 2022, Elizabeth C. Plunk*, Weston S. Chambers*, and Sean M. Richards. 2022. *Systems Biology In Metabolomics Perspectives, From Theory to Practical Application*. Elsevier. Pages 3-25. 1st Edition - April 1, 2022
40. Jessica Cline, Undergraduate, Mentor: Francesca Leasi, 2022, DNA metabarcoding reveals impacts of anthropogenic stressors on freshwater meiofauna. *Limnologica*, 96: 126005. <https://doi.org/10.1016/j.limno.2022.126005>.
41. Shelbuy Campbell, Undergraduate, Mentor: Azad Hossain, 2022, Campbell, S., and Hossain, A., 2022, Application of Remote Sensing to Study the Potential Impacts of 2020 Wildfire Events on the Glaciers of Mount Baker, Washington, *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, Volume XLVI-M-2-2022, pp 131-134, Proceeding ASPRS 2022 Annual Conference, 6–8 February & 21–25 March 2022, Denver, Colorado, USA & virtual.
42. Hao Brooks, Undergraduate, Mentor: DeAnna Beasley, 2023, Brooks, H.B.*, Guzman-Hernandez, I.*, and Beasley, D.E. (2023). Ant diversity in a temperate urban environment. *BIOS*. 93(4): 117 – 123. <https://doi.org/10.1654/BIOS-D-20-00018>
43. Itzel Guzman Hernandez, Undergraduate, Mentor: DeAnna Beasley, 2023, Brooks, H.B.*, Guzman-Hernandez, I.*, and Beasley, D.E. (2023). Ant diversity in a temperate urban environment. *BIOS*. 93(4): 117 – 123. <https://doi.org/10.1654/BIOS-D-20-00018>
44. Rachel Hofer, Undergraduate, Mentor: David Giles, 2023, Hofer R.N., A. Lin, B.J. House, C.N. Purvis, B.J. Harris, S.J.K. Symes and D.K. Giles. 2023. Exogenous polyunsaturated fatty acids (PUFAs) influence permeability, antimicrobial peptide resistance, biofilm formation, and membrane phospholipid structure in A-layer and non-A-layer strains of *Aeromonas salmonicida*. *J Fish Dis* 46(1):31-45. doi: 10.1111/jfd.13715.
45. Allen Lin, Undergraduate, Mentor: David Giles, 2023, Hofer R.N., A. Lin, B.J. House, C.N. Purvis, B.J. Harris, S.J.K. Symes and D.K. Giles. 2023. Exogenous polyunsaturated fatty acids (PUFAs) influence permeability, antimicrobial peptide resistance, biofilm formation, and membrane phospholipid structure in A-layer and non-A-layer strains of *Aeromonas salmonicida*. *J Fish Dis* 46(1):31-45. doi: 10.1111/jfd.13715.
46. Benjamin House, Undergraduate, Mentor: David Giles, 2023, Hofer R.N., A. Lin, B.J. House, C.N. Purvis, B.J. Harris, S.J.K. Symes and D.K. Giles. 2023. Exogenous polyunsaturated fatty acids (PUFAs) influence permeability, antimicrobial peptide resistance, biofilm formation, and membrane phospholipid structure in A-layer and non-A-layer strains of *Aeromonas salmonicida*. *J Fish Dis* 46(1):31-45. doi: 10.1111/jfd.13715.
47. Christopher Purvis, Undergraduate, Mentor: David Giles, 2023, Hofer R.N., A. Lin, B.J. House, C.N. Purvis, B.J. Harris, S.J.K. Symes and D.K. Giles. 2023. Exogenous polyunsaturated fatty acids (PUFAs) influence permeability, antimicrobial peptide resistance, biofilm formation, and membrane phospholipid structure in A-layer and non-A-layer strains of *Aeromonas salmonicida*. *J Fish Dis* 46(1):31-45. doi: 10.1111/jfd.13715.
48. Kwame Forbes, Undergraduate, Mentor: David Giles, 2023, Saksena S., K. Forbes, N. Rajan and D. Giles. 2023. Phylogenetic investigation of Gammaproteobacteria proteins involved in exogenous long-chain fatty acid acquisition and assimilation. *Biochem Biophys Rep* 35: 101504.
49. Saksham Saksena, Undergraduate, Mentor: David Giles, 2023, Saksena S., K. Forbes, N. Rajan and D. Giles. 2023. Phylogenetic investigation of Gammaproteobacteria proteins involved in exogenous long-chain fatty acid acquisition and assimilation. *Biochem Biophys Rep* 35: 101504.

Appendix 5-A

Asset Description	Cap.date
Millipore Sigma Direct-Q 3 UV Water Filtration Sys	10/4/2023
P/N S5898 Frantz Magnetic Barrier Laboratory	9/28/2023
Thermo Sci TDE500 -40 Freezer	8/31/2023
Dell Mobile Precision Workstation 3581 CTO	8/31/2023
14in MacBook Pro, 2023	8/20/2023
14in MacBook Pro, 2023	8/20/2023
14in MacBook Pro, 2023	8/20/2023
Mac Mini Desktop, M2 Pro, 2023	8/1/2023
Fisher Isotemp Incubator	7/26/2023
IMAC 24" PURPLE	7/1/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
CX33 Compound Microscope	6/22/2023
Precision 5820 Tower XCTO Base	6/15/2023
MacBook Pro 14"	6/15/2023
VWR 10L Incubator Shaker	6/7/2023
VWR Mini Bead Mill Homogenizer	5/31/2023
VWR Advanced Dura Shaker	5/31/2023
Leica DM 750P Microscope	5/28/2023

Apple 14in MacBook Pro M1 (2021)	5/23/2023
LabConco Purifier Logic+ Class II A2 BSC 3ft	5/11/2023
LabConco Purifier Logic+ Class II A2 BSC 4ft	5/9/2023
Leica Cover for Stand Top Incl. Bio Mag.Changer	5/8/2023
RP-4 Shaking Table	4/28/2023
Leica DM750P	4/9/2023
ATS Scientific Receiver 164-167.000 MHz	3/31/2023
Muffle Furnace	1/27/2023
Olympus BX41-TF	12/12/2022
14in MacBook Pro Laptop	11/16/2022
iMac 24"	10/31/2022
Apple 24in iMac desktop, M1, 2021	9/26/2022
Apple 24in iMac desktop, M1, 2021	9/26/2022
Apple 24in iMac desktop, M1, 2021, green	9/26/2022
iMac 24"	8/31/2022
MacBook Pro 14"	7/31/2022
iMac 24"	7/31/2022
iMac 24"	7/31/2022
External Light Source EL 6000	7/1/2022
Biomark IS1001-24V Antenna Control Node	7/1/2022
Biomark IS1001-24V Antenna Control Node	7/1/2022
Top DM6 B, 5-fold, Fluo, 7xM25 Microscope	7/1/2022
Objective N Plan 50x/0.90 Oil	7/1/2022
2022 Ford Expedition XL #6610	6/24/2022
Genesys 50 UV-Visible Spectrophotometer	6/24/2022
Fisher Sonic Dismembrator	6/9/2022
Stuart Shaking Water Bath SBS40	6/7/2022
LabConco Protector Echo Filtered Fume Hood	5/26/2022
MacBook Pro 14"	2/28/2022
ThermoScientific TSX Ultra Low Freezer	1/10/2022
Stuart Reciprocating Shaker SSL2	12/27/2021
Peristaltic Pump Sartorius Stedim Biotech GmbH	11/30/2021
MacBook Pro 13"	11/27/2021
Surface Pro 7+	7/1/2021
Phantom 4 Multispectral System	6/18/2021
RWF 11/13 1100C Chamber Furnace	6/10/2021
Extron DTP CrossPoint 84	6/3/2021
SONY Projector	6/3/2021
2022 Tracker Grizzly 2072CC Boat	5/27/2021
So-Low Freezer U85-22	5/26/2021
WASP LTE Datalogger with String Potentiometer	5/26/2021
MacBook Pro 16"	5/26/2021
Olympus BH2 Polarizing Microscope	5/21/2021
Olympus BH2 Polarizing Microscope	5/21/2021
Accuscope 3076 w/ Boom Stand	5/21/2021
LabRepCo -40 Freezer	5/21/2021
TopoBox Sandbox Kit	5/17/2021
Hydrolab Surveyor HL	5/7/2021
Leica DM750P LED Microscope	5/3/2021
Leica DM6 B	4/30/2021

Leica DMC 4500 Camera	4/30/2021
Entomology Cabinet	4/28/2021
Entomology Cabinet	4/28/2021
Entomology Cabinet	4/28/2021
MacBook Pro 13"	4/27/2021
MacBook Pro 13"	4/27/2021
Servo Precision Sensitive Drill Press	4/27/2021
Leica S9i StereoZoom	4/27/2021
Eppendorf Mastercycler Nexus Gradient	4/27/2021
Spectra/Chrom Fraction Collector CF-2	3/26/2021
MacBook Pro 16"	3/26/2021
Sontek FlowTracker 2 Handheld Display Unit	3/17/2021
Sontek FlowTracker 2 Probe Assembly	3/17/2021
Hach HQ440d pH Meter	2/26/2021
16inch MacBook Pro Laptop Refresh 2/3/2021	2/3/2021
iMac 27"	9/27/2020
Masterflex L/S Digital Dispensing System	7/27/2020
Pika L Hyperspectral Outdoor Kit	7/1/2020
Zeiss Stemi 508 Trinoc-StereoMicroscope	7/1/2020
MacBook Pro 13"	7/1/2020
MacBook Pro 13"	3/27/2020
MacBook Pro 16"	3/27/2020
Aqua TROLL 600, Non-Vented 0-9m	3/13/2020
Prod, Aquion, DG, CM7-SE	3/9/2020
Prod, AS-DV	3/9/2020
YSI Pro Plus Water Quality Meter	2/27/2020
Dell XPS 15 7000 Series-7590	2/27/2020
Herbarium Drying Cabinet	2/25/2020
Satorius Secura Semi-Micro Balance	12/25/2019
AS1310 155 For TRC1300	11/29/2019
MacBook Pro 13.3"	11/27/2019
MacBook Pro 13.3"	11/27/2019
Dell Precision 5820	10/27/2019
MacBook Pro 15"	10/27/2019
Herbarium Storage 10 Cabinet System	9/20/2019
MacBook Pro 15"	8/27/2019
VWR Incubating Mini Shaker	8/27/2019
Eppendorf Vacufuge Concentrator	8/27/2019
Mac Mini	7/27/2019
Dell XPS	7/1/2019
Horiba Water Quality Meter U-5000G	6/10/2019
Biotek 800 TS Microplate Reader	6/3/2019
AnalytikJena UVP GelStudio Imagin System	5/31/2019
Trinoc Microscopew/ Moticam	5/27/2019
Canon EOS Digital Rebl T7i 24MP DSLR Camera	5/27/2019
Luxeo 6Z Trinocular StereoMicroscopewith Tube	5/27/2019
27in iMac w/Retina 5K Display Refresh	5/7/2019
27in iMac w/Retina 5K Display Refresh	5/7/2019
27in iMac w/Retina 5K Display Refresh	5/6/2019
15in MacBook Pro w/Touch Bar - Space Gray Refresh	5/3/2019

[illegible]

Leica DM750 Compound Microscope	3/21/2017
Leica DM750 Compound Microscope	3/21/2017
Leica DM750 Compound Microscope	3/21/2017
Leica DM750 Compound Microscope	3/21/2017
Leica DM750 Compound Microscope	3/21/2017
Eppendorf Centrifuge 5804 R	3/8/2017
Disarticulated Human Skeleton	2/25/2017
Leica DM750 Trinocular Microscope	2/22/2017
CFX Connect RT-PCR	2/14/2017
Sharp LC-70LE661U 70" TV	12/12/2016
Sharp LC-70LE661U 70" TV	12/12/2016
Sharp LC-70LE661U 70" TV	12/12/2016
Electrofisher Combo LR-24	10/24/2016
Dell Mobile Precision 7710 XCTO BAS E	10/6/2016
Bertin Minilys	9/20/2016
iMac 27"	9/1/2016
SC Ultra Low Upright Freezer PV85-22	8/31/2016
MSI WS72 M1000 Mobile Workstation (Laptop)	8/30/2016
YSI H2O Qual Meter: DSS-30 Meter & Handheld	8/17/2016
27" iMac	8/12/2016
iMac 27"	8/5/2016
iMac 27"	7/27/2016
iMac 27"	7/27/2016
Craftsman 5200 Riding Lawn Mower	6/25/2016
BioTek Synergy H1 Microplate Reader	3/15/2016
ThermoScientific Spectronic 200	3/15/2016
Jenoptik Dig Scope Camera	2/23/2016
SHEL LAB Reach-In Lab Incubator	1/14/2016
IsoTemp WJ CO2 Incubator	11/17/2015
Meiji Techno Trinocular Polarizing Microscope	9/14/2015
Meiji Techno Trinocular Polarizing Microscope	9/14/2015
High Definition Video/Digital Camera	9/14/2015
High Definition Video/Digital Camera	9/14/2015
Leica S8 APO Stereozoom	8/5/2015
Leica MC170 HD Camera	6/11/2015
Cannon EOS 5D Mark III Digital Camera Body Kit	5/27/2015
Smart Coater DII-2010SCTR with Au Target	5/18/2015
15 inch MacBook Pro for (T J Gaudin)	5/1/2015
21.5 inch iMac (Z0PE)	3/25/2015
Dell XPS 15 Touch for Dr. Loren Hayes	12/31/2014
Convion model PGR15 Plant Growth Chambers: Boyd	12/15/2014
Convion model PGR15 Plant Growth Chambers: Boyd	12/15/2014
Convion model PGR15 Plant Growth Chambers: Boyd	12/15/2014
Convion model PGR15 Plant Growth Chambers: Boyd	12/15/2014
Convion model E7/2 Plant Growth Chambers: Boyd	10/13/2014
Convion model E7/2 Plant Growth Chambers: Boyd	10/13/2014
LabConco Dishwasher	10/1/2014
Percival Scientific Incubator Model I-30BLL	8/19/2014
Percival Scientific Incubator Model I-30BLL	8/19/2014
BioSafety Cabinet	6/30/2014

[illegible]

Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Compound Microscope (Olympus CX31)	6/20/2011
Stereo Microscope(Olympus SZ-6145TR)	6/20/2011
SH-3000 Swinging Bucket Rotor -Rec'vd 12/30/10	3/25/2011
centrifuge - Allegra X-22	2/18/2011
rotor assembly w/4 buckets SX-4250 (INSIDE 617078)	2/18/2011
Macbook Pro 15"	1/28/2011
seismometer	1/21/2011
Combination nucleic acid workstation	1/6/2011
Leica DM 750 P Polarizing Microscope	10/21/2010
Leica DM 750 P Polarizing Microscope	10/21/2010
Leica DM 750 P Polarizing Microscope	10/21/2010
MacBook Pro, 13-inch	10/1/2010
Soil CO2 Flux Chamber	8/16/2010
Scientific Laboratory Steam Sterilizer	6/21/2010
OLYMPUS BX61 Electron Microscope	4/5/2010
Steam Sterilizer	3/18/2010
StereoMicroscope(Olympus SZ61)	3/3/2010
Confocal Microscope	2/9/2010
Latitude E6500 Laptop	1/14/2010
Combination nucleic acid workstation	9/22/2009
iMac, 24-inch, Intel Core 2 Duo	8/26/2009
VZ-8 Light Document Camera	8/13/2009
Nanodrop 2000C w/cuvette	6/23/2009
Leica DM EP Polarizing Microscope	5/19/2009
iMac, 24-inch, Intel Core 2 Duo	3/6/2009
LI-6400XTR Fluorescence &Gas Exchange System Pkg	12/17/2008

Advanced Co2 Analysis Package (with Flow Meter)	9/22/2008
professional Laser Tech Laser Rangefinder with	9/4/2008
DR2800 SPECTRO W/ATTACHMENTS	7/1/2008
iMac, 24-inch, Intel Core 2 Duo	5/23/2008
Cell Disruption Bomb from Parr Inst	5/21/2008
Velocity Meter	4/18/2008
BioLogic LP System with BioFrac Fraction Collector	3/20/2008
Canon camera (digital camera w/field kit)	3/6/2008
54-Well HotBlock and AirLite HEPA Enclosure	2/13/2008
Olympus SZX10 Stereo Microscope	2/1/2008
Eppendorf Mastercycler Thermal Cycler, Gradient	11/19/2007
Eppendorf Mastercycler Gradient	11/19/2007
Eppendorf Centrifuge (Model 5424)	11/8/2007
Imaging System, Photodoc-it 50	10/31/2007
Optiplex 745 Minitowers	8/1/2007
Optiplex 745 Minitowers	8/1/2007
Revco Ultra low freezer (24.4 cu. ft - upright	6/30/2007
Leica DME Transmitted POL Binocular Microscope	6/28/2007
20 Working Jon Boat (heavy duty; all welded)	6/4/2007
Humminbird 997 SICombo (depth finder)	5/19/2007
Mokai Watercraft	2/8/2007
Unispense Dispenser	12/7/2006
MJ Mini Cycler, 48-Well	10/10/2006
Dell Optiplex GX620 Minitower Computer	8/22/2006
C25 Incubator/Shaker with Universal Platform	7/31/2006
Spotting Scope: Straight Armor	7/14/2006
Buehler Thin Sectioning System	6/28/2006
Savant Speed-Vac Concentration System	5/16/2006
Leica Binocular Microscope	5/3/2006
Leica Binocular Microscope	5/3/2006
Leica Binocular Microscope	5/3/2006
Leica Binocular Microscope	5/3/2006
Bio-Mini Promo, UV/visible spectrophotometer	4/11/2006
24.4 cubic feet, -86 C freezer	4/11/2006
Inspiron 710m Pentium Laptop computer	4/11/2006
BTX 630 Electroporation System	4/7/2006
Sliding Door Refrigerator (38 cubic feet)	3/29/2006
CoolSnapCF Dig Color Camera	3/28/2006
Leica L5 FL (GFP) Stereozoom	2/22/2006
Centrivap DNA Concentrator 115	1/19/2006
EPPENDORF Mastercycler	1/9/2006
Incubated shaker with universal platform	12/12/2005
Plant Water Studus Console, compact model	12/5/2005
Centrifuge - "Brushless" RC-5C Plus Microcomputer	12/2/2005
WESCOR Dew Point Microvoltmeter	12/2/2005
High Speed Micro Centrifuge	11/22/2005
High Speed Micro Centrifuge	11/22/2005
High Speed Micro Centrifuge	11/22/2005
SS-34 Superspeed Fixed-Angle Rotor	11/22/2005
Stereozoom Seapo Trans Light (Microscope)	11/16/2005

SLA-1500 Super-Lite Rotor	11/14/2005
Foto/Convertible Dual It Trans	11/9/2005
Thermo Hybaid PX2 Thermal Cycler Chassis	11/9/2005
CIRAS-2 Portable Photosynthesis System	11/8/2005
Table Top Zebrafish Rack	11/8/2005
Power Supply 4000V 110 V	10/28/2005
Shimadzu Scientific Bio-Mini UV Spectrophotometer	10/27/2005
Fotodyne FOTO/Analyst Apprentice System	10/18/2005
Eppendorf Mastercycler EP Gradient S	10/6/2005
Fotoanalyst/Apprentice System	10/6/2005
Eppendorf Centrifuge 5415-D	10/6/2005
EPPENDORF Instruments Centrifuge, model # 5415D	10/6/2005
Model 400 Benchtop Centrifuge	10/6/2005
Centrifuge w/Free Rotor and Tubes	9/13/2005
GeoXT Standalone System	1/6/2005
Vertical Pipette Puller	11/17/2004
Zoom stereoMicroscopeACCU-SCOPE	7/16/2004
Compound MicroscopePackage #1	6/22/2004
compound Microscopepackage #1	6/22/2004
compound Microscopepackage #1	6/22/2004
compound Microscopepackage #1	6/22/2004
compound Microscopepackage #1	6/22/2004
Multi Probe System w/Barometer	6/14/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
Compound MicroscopePackage #2	6/4/2004
PERCIVAL INCUBATOR	4/20/2004
Trinocular Photo/Observation Tube	4/19/2004
Digital Firewire Camera and SW Kit	4/19/2004

Trinocular HC Photo/Video/Observation Tube	4/19/2004
Trimble Geo XT w/o software	3/30/2004
OptiPlex GX270 Small MiniTower	10/8/2003
Sony VPL-CS5 LCD Projector SVGA 1800 Lumens 5.8	11/27/2002
Dell Latitude C640 Laptops	10/7/2002
Dell Latitude C640 Laptops	10/7/2002
Synergy ABS/FLR w/inc. Reader & KC-4 Software	10/1/2002
Fisher Isotemp Co2 and Three-Gas Incubators	9/13/2002
Biological Safety Cabinet - Class II Type A/B3	8/8/2002
Fluorescence Microscope and Digital Imaging System	7/29/2002
PowerGen Model 125	7/29/2002
Dell Inspiron 8100 Multimedia Mobile Desktop Comp.	7/1/2002
Multi Probe System Instrument	6/30/2002
Balance - Mettler Toledo AG Series Standard Level	6/25/2002
Power Supply 4000V 110V	6/21/2002
Transillum, Variable Intensity 8" x 16"	6/14/2002
Ashcroft Aerobic Type A Chamber, Automatic Airlock	5/2/2001
X-RAY DIFFRACTOMETER	3/10/2000
WATER 2690 ALLIANCE SYSTEMS	8/1/1999
M32 COMPUTER SINGLE SYSTEM 350MHZ W98	8/1/1999
996 PHOTODIODE ARRAY DETECTOR	8/1/1999
LABCONVO FREEZER DRY W/SHELL & PURG 6L	4/1/1999
NIKON ECLIPSE E600 ADVANCED RESEARCH MICROSCOPE	3/1/1999
LEICA DM LSP POLARIZING Microscope(BY8)	6/1/1998
LEICA DM LSP POLARIZING Microscope(BY8)	6/1/1998
LEICA GZ6 STEREO MicroscopeW/TRANSMITTED LIGHT (D	2/1/1998
GPS /BEACON PROXR CBS FOR EDUCATORS	5/1/1997
LEICA LEITZ LABORLUX II POL S MICROSCOPE	9/1/1996
STEROMicroscopeW/ATTACHMENTS (DR GAUDIA)	3/1/1995
LEICO WILD MZ-8 STEROMicroscopeW/ATTACHMENTS	1/1/1995
HACH DREL/2000 WATER TESTING KIT	6/1/1993
HISTOSTAT CRYOSTAT 220V 50HZ	5/1/1989
SINGLE CHANNEL SEISMOGRAPH (BY10) (CABINET)	6/1/1979

Appendix 5-B. Biology, Geology & Environmental Science Ranked Equipment Need List

Biology, Geology & Environmental Science Equipment Needs List – 2018 to 2024. Tables 1- 6 below provide details of the ranked equipment for each year, the year the item was added to the list, the justification, cost, the category (described below), and the course impacted by the equipment.

Table 1.

2024 – Carry Over From 2023

CATEGORIES OF EQUIPMENT:

- I. Equipment needed to maintain course instructional integrity**
- II. Equipment needed to meet existing infrastructure deficiencies**
- III. Equipment needs to meet continuing student/faculty research objectives**

Rank	Fiscal Year Added to List	Quantity	Item	Justification	Cost	Category	Courses impacted
1	2019	12	Student Compound Microscopes – such as Olympus CX33	123 Holt has 12 compound scopes. Adding microscopes to this room will make the teaching spaces usable for more courses.	\$25,603 Total (12 X \$2133.60 includes shipping)	I, II	All labs being taught in 123 Holt
2	2019	12	Student Stereoscopes – such as Accuscope 3075-E-LED	123 Holt has 12 stereoscopes scopes. Adding microscopes to this room will make the teaching spaces usable for more courses.	\$14,460 Total (12 X \$1205.00)	I, II	All labs being taught in 123 Holt

3	<u>2017</u>	1	Equipment Needed to Develop Molecular ID Lab Exercise for Microbiology Teaching Labs	ID of bacterial cultures in research and industry is moving towards molecular techniques. Our micro teaching labs need to evolve to include these techniques Committee discussed that once a skeleton of the labs were written, we could move this item back up to #1. Having something written will help determine exactly what equipment will be needed. (February 9, 2022)	\$12,000 (for all equipment necessary)	I, II, III	BIOL 4220, BIOL 4530, BIOL 4430 ESC 4010, ESC 5030, ESC 4430, ESC 5040
4	<u>2008</u>	1	Total Organic Carbon Analyzer	Modernize/improve microbiology & ESC labs	\$34,000	I, III	BIOL 4220L, 4010L, 4040L, + graduate equivalent courses
5	<u>2006</u>	1	Electric Winch	Safety – self rescue from remote sites	\$3,500	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
6	<u>2006</u>	1	Honda Four Trax 4X4	Access to remote field sites	\$7,243	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
7	<u>2014</u>	1		Needed to replace old, broken unit Radioactive Materials Lab	\$45,771.91	I, II, III	

Liquid Scintillation Counter Equipment Committee wants to know if there are ways to demonstrate the same concepts with using smaller/less expensive instruments. Are there different ways to accomplish the same goals? (Feb 2020) <u>October 25, 2021:</u> Rardy to draft a statement inquiring about any faculty wanting to use radioactive isotopes in the next 5 years. Committee considering decommissioning radioactives lab. <u>Feb. 9, 2022:</u> Rardy would like to get the new Dept Head's input into decommissioning this equipment (& radioactives lab). Cheryl asked him to write something up this semester to ask the Department as a whole, so we would know going into a conversation with the Dept Head if others would use this capability in the Dept. He said he would after Spring Break. As of 10/19/2022, Cheryl hasn't received anything from Rardy.					(Price updated from quote 5/28/21)	BIOL 4430, 4530, ESC 5030, 5040, 5997, 5998, 5999	
10	2024	24	New computers in Holt 399	4 years old, more powerful equipment needed to run GIS software	\$33,908.64	I	
			TOTAL		\$176,486.55		

Table 2.

2023 – Carry Over From 2022

CATEGORIES OF EQUIPMENT:

- I. Equipment needed to maintain course instructional integrity**
- II. Equipment needed to meet existing infrastructure deficiencies**
- III. Equipment needs to meet continuing student/faculty research objectives**

Rank	Fiscal Year Added to List	Quantity	Item	Justification	Cost	Category	Courses impacted
1	2019	12	Student Compound Microscopes – such as Olympus CX33	123 Holt has 12 compound scopes. Adding microscopes to this room will make the teaching spaces usable for more courses.	\$25,603 Total (12 X \$2133.60 includes shipping)	I, II	All labs being taught in 123 Holt
2	2019	12	Student Stereoscopes – such as Accuscope 3075-E-LED	123 Holt has 12 stereoscopes scopes. Adding microscopes to this room will make the teaching spaces usable for more courses.	\$14,460 Total (12 X \$1205.00)	I, II	All labs being taught in 123 Holt
3	<u>2017</u>	1	Equipment Needed to Develop Molecular ID Lab Exercise for Microbiology Teaching Labs	ID of bacterial cultures in research and industry is moving towards molecular techniques. Our micro teaching labs need to evolve to include these techniques Committee discussed that once a skeleton of the labs were written, we could move this item back up to #1. Having something written will help determine exactly what equipment will be needed.	\$12,000 (for all equipment necessary)	I, II, III	BIOL 4220, BIOL 4530, BIOL 4430 ESC 4010, ESC 5030, ESC 4430, ESC 5040

				(February 9, 2022)			
4	<u>2008</u>	1	Total Organic Carbon Analyzer	Modernize/improve microbiology & ESC labs	\$34,000	I, III	BIOL 4220L, 4010L, 4040L, + graduate equivalent courses
5	<u>2006</u>	1	Electric Winch	Safety – self rescue from remote sites	\$3,500	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
6	<u>2006</u>	1	Honda Four Trax 4X4	Access to remote field sites	\$7,243	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
			TOTAL		\$96,806.00		

Table 3.

2022 – Carry Over From 2021

CATEGORIES OF EQUIPMENT:

- I. Equipment needed to maintain course instructional integrity**
- II. Equipment needed to meet existing infrastructure deficiencies**
- III. Equipment needs to meet continuing student/faculty research objectives**

Rank	Fiscal Year Added to List	Quantity	Item	Justification	Cost	Category	Courses impacted
1	2019	12	Student Compound Microscopes – such as Olympus CX33	123 Holt has 12 compound scopes (I'm cleaning them currently). Adding microscopes to this room will make the teaching spaces usable for more courses.	\$25,603.20 Total (12 X \$2133.60 includes shipping)	I, II	All labs being taught in 123 Holt
2	2019	12	Student Stereoscopes – such as Accuscope 3075-E-LED	123 Holt has 12 compound scopes (I'm cleaning them currently). Adding microscopes to this room will make the teaching spaces usable for more courses.	\$14,460.00 Total (12 X \$1205.00)	I, II	All labs being taught in 123 Holt
3	2019	1	Trinocular Teaching Compound & Stereo Microscopes with Camera – such as Olympus CX41 and AU-600	Having trinocular scopes in 123 Holt would help instructors show students how to use microscopes and show students what they are supposed to be viewing in their scopes.	\$3,700	I, II	Any labs in 123 Holt
4	<u>2017</u>	1	Equipment Needed to Develop Molecular ID Lab Exercise for Microbiology Teaching Labs	ID of bacterial cultures in research and industry is moving towards molecular techniques. Our micro	\$12,000 (for all equipment necessary)	I, II, III	BIOL 4220, BIOL 4530, BIOL 4430 ESC 4010, ESC 5030, ESC 4430, ESC 5040

				teaching labs need to evolve to include these techniques			
5	2020	30	30 iPads, 30 iPad protector cases, 30 Logitech crayons, 1 storage cabinet	Will allow enhanced student learning of earth systems and processes by allowing students to interact with real-time data imagery. Supports recommendation of 5-year program review to incorporate more tech into courses.	\$12,680 Total	I, II	GEOL 1110; GEOL 3410; GEOL4080; GEOL 3220; Hydrology; GEOL 3530; GEOL 3540
6	<u>2008</u>	1	Total Organic Carbon Analyzer	Modernize/improve microbiology & ESC labs	\$34,000	I, III	BIOL 4220L, 4010L, 4040L, + graduate equivalent courses
7	<u>2006</u>	1	Electric Winch	Safety – self rescue from remote sites	\$3,500	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
8	<u>2006</u>	1	Honda Four Trax 4X4	Access to remote field sites	\$7,243	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
9	<u>2014</u>	1	Liquid Scintillation Counter	Needed to replace old, broken unit Radioactive Materials Lab	\$45,771.91	I, II, III	BIOL 4430, 4530, ESC 5030, 5040, 5997, 5998, 5999

			TOTAL		\$158,958.11		

Table 4.

2021 – Carry Over From 2020

CATEGORIES OF EQUIPMENT:

- I. Equipment needed to maintain course instructional integrity**
- II. Equipment needed to meet existing infrastructure deficiencies**
- III. Equipment needs to meet continuing student/faculty research objectives**

Rank	Fiscal Year Added to List	Quantity	Item	Justification	Cost	Category	Courses impacted
1	2019	24	Student Compound Microscopes – such as Olympus CX33	123 Holt does not have any compound scopes. Adding microscopes to this room will make the teaching spaces usable for more courses.	\$51,206.40 Total (24 X \$2133.60 includes shipping)	I, II	All labs being taught in 123 Holt
2	2019	24	Student Stereoscopes – such as Accuscope 3075-E-LED	123 Holt does not have any compound scopes. Adding microscopes to this room will make	\$28,920.00 Total (24 X \$1205.00)	I, II	All labs being taught in 123 Holt

				the teaching spaces usable for more courses.			
3	2021	24	Stereomicroscopes (Such as Accuscope 3075)	>1/2 of the Stereoscopes in 228 Holt are Parco Scientific and very old. The optics do not allow the correct IDs of observations of invertebrates and make it impossible for students to complete their labs.	\$28,000	I	Any lab taught in 228 Holt (e.g. BIOL 4085, 407, 4130)
4	2019	1	Trinocular Teaching Compound & Stereo Microscopes with Camera – such as Olympus CX41 and AU-600	Having trinocular scopes in 123 Holt would help instructors show students how to use microscopes and show students what they are supposed to be viewing in their scopes.	\$3,700	I, II	Any labs in 123 Holt
5	<u>2017</u>	1	Equipment Needed to Develop Molecular ID Lab Exercise for Microbiology Teaching Labs	ID of bacterial cultures in research and industry is moving towards molecular techniques. Our micro teaching labs need to evolve to include these techniques	\$12,000 (for all equipment necessary)	I, II, III	BIOL 4220, BIOL 4530, BIOL 4430 ESC 4010, ESC 5030, ESC 4430, ESC 5040

6	2020	1	SOMSO Domestic Cat Model (including musculature)	Help with setting up labs. Only have 12 preserved cats to use in lab practical, but 25 stations, so additional models are useful for practicals. Provides students with valuable study aide.	\$3,678.00	II	Comp Vert Zoo BIOL 4050L Mammalogy BIOL 4140 Func Human Anat BIOL 2060
7	2020	30	30 iPads, 30 iPad protector cases, 30 Logitech crayons, 1 storage cabinet	Will allow enhanced student learning of earth systems and processes by allowing students to interact with real-time data imagery. Supports recommendation of 5-year program review to incorporate more tech into courses.	\$12,680 Total	I, II	GEOL 1110; GEOL 3410; GEOL4080; GEOL 3220; Hydrology; GEOL 3530; GEOL 3540
8	<u>2008</u>	1	Total Organic Carbon Analyzer	Modernize/improve microbiology & ESC labs	\$34,000	I, III	BIOL 4220L, 4010L, 4040L, + graduate equivalent courses
9	<u>2006</u>	1	Electric Winch	Safety – self rescue from remote sites	\$3,500	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
10	<u>2006</u>	1	Honda Four Trax 4X4	Access to remote field sites	\$7,243	III	Field oriented courses In BIOL, ESC, GEOL

11	?	1	UTC Hybrid 4X4 Field Consortium Vehicle	Access to remote field sites (multiple seating required) As of Feb 9, 2022, the vehicle should be delivered in June 2022	\$50,000	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
12	<u>2014</u>	1	Liquid Scintillation Counter	Needed to replace old, broken unit Radioactive Materials Lab	\$45,771.91	I, II, III	BIOL 4430, 4530, ESC 5030, 5040, 5997, 5998, 5999
			TOTAL		\$280,699.31		

Table 5.

2020 – Carry Over From 2019

CATEGORIES OF EQUIPMENT:

I. Equipment needed to maintain course instructional integrity

II. Equipment needed to meet existing infrastructure deficiencies

III. Equipment needs to meet continuing student/faculty research objectives

Rank	Fiscal Year Added to List	Quantity	Item	Justification	Cost	Category	Courses impacted
1	?	1	Multiprobe water quality field kits Purchased via PO 4500055173 April 20, 2021	Modernize/improve environmental science labs Is this really needed still? For what particular courses would it be used for? As of March 18, 2021 – Yes it is needed	\$6,000	I	BIOL 3070 BIOL/ESC 4520 ESC 1500L, 1510L
2	2017	1	Leica Microscope Purchased via PO 4500055005 March 23, 2021	Updating Geology lab abilities	\$5,000	I,II,III	GEOL 1120, 3410, 3420, 3540, 4500, 4800
3	2016	1	Fisher Isotemp Ultra-low (-80 C), undercounter freezer As of March 26, 2021, Nanda did not think it was needed. Requested some hot plates, etc instead. Did not hear back from Rardy. This should be taken off of list	For long-term storage of our bacterial culture collection – many of these cultures should not be stored with other teaching & research materials from diff. disciplines	\$8,884	I, II, III	BIOL 2100, 4220, 4280, 4530, 4430, ESC 4010, 4430, 5030, 5040
4	2017	1	Insect Cabinet for the Natural History Museum Purchased via PO 4500055034 March 2021	The insect teaching collection is at capacity and cannot accommodate any new specimens. These cabinets are vital for the growth and well being of the collection.	\$3,883 (shipping incl.)	I, II, III	BIOL4070, BIOL4130, BIOL4999 (Parasitology)

	-		Equipment Needed to Develop Molecular ID Lab Exercise for Microbiology Teaching Labs	ID of bacterial cultures in research and industry is moving towards molecular techniques. Our micro teaching labs need to evolve to include these techniques Committee would like to know if this is for one lab unit or entire course? Would like to have further justification.	\$12,000 (for all equipment necessary)		BIOL 4220, BIOL 4530, BIOL 4430 ESC 4010, ESC 5030, ESC 4430, ESC 5040
6	2019	10	Microscope Cabinets/Cubbies Purchased via PO 4500055232 April 29, 2021 for 123 Holt	In order to have all teaching labs equipped with microscopes for each student to use during lab, there needs to be a place to store the microscopes. The cubbies purchased in 2017 seem to be working well.	\$9,845.00 (10 X 984.50)	I, II	All labs being taught in 123 Holt, 321 Holt 321 Holt has cabinets to store microscopes already
7	2019	1	Futura PLUS+ Series 9.0 cuft -40 chest freezer Purchased via PO 4500055231 April 28, 2021	Critical for pest control of Natural History Museum and Herbarium collections. Current -40 freezer isn't large enough to accommodate the amt. of specimens that need to be processed before placement in the collections. Committee would like to know if this is still needed.			
8	2019	1	U85-22 -80 Freezer Purchased via PO 4500055200 April 26, 2021	Natural History Museum and Herbarium currently do not have a -80 freezer for long-term maintenance of DNA/biological samples. Needed to establish a permanent freezer collection for future DNA extractions and DNA library.	\$9000 (shipping estimate included)	II, III	All zoology and botany courses

9	2019	35	Student Compound Microscopes – such as Olympus CX33	321 Holt does not have enough compound scopes in the lab for every student to be using one. 123 Holt does not have any compound scopes. Adding microscopes to these rooms will make the teaching spaces usable for more courses.	\$74,676 Total (35 X \$2133.60 includes shipping)	I, II	All labs being taught in 123 Holt and 321 Holt
10	2019	35	Student Stereoscopes – such as Accuscope 3075-E-LED	321 Holt does not have enough compound scopes in the lab for every student to be using one. 123 Holt does not have any compound scopes. Adding microscopes to these rooms will make the teaching spaces usable for more courses.	\$42,175 Total (35 X \$1205.00)	I, II	All labs being taught in 123 Holt and 321 Holt
11	2019	8	Trinocular Teaching Compound Microscopes with Camera – such as Olympus CX41 and AU-600 Purchased Trinocular Scopes for 120 Holt, 321 Holt, and Grote 206, 208, 210 Via Neil Bingham May 21, 2021	Most teaching labs do not have this technology in the room. Having this would help instructors show students how to use microscopes and show students what they are supposed to be viewing in their scopes.	\$16,000 Total (8 x \$2000)	I, II	All labs being taught in about 8 different teaching labs. Mark did not reply soon enough to my inquiry in April 2021 – he would like compound&stereo in 123 Holt when possible
12	2020	1	SOMSO Domestic Cat Model (including musculature)	Help with setting up labs. Only have 12 preserved cats to use in lab practical, but 25 stations, so additional models are useful for practicals. Provides students with valuable study aide.	\$3,678.00	II	Comp Vert Zoo BIOL 4050L Mammalogy BIOL 4140 Func Human Anat BIOL 2060
13	2020	30			\$12,680 Total	I, II	

			30 iPads, 30 iPad protector cases, 30 Logitech crayons, 1 storage cabinet	Will allow enhanced student learning of earth systems and processes by allowing students to interact with real-time data imagery. Supports recommendation of 5-year program review to incorporate more tech into courses.			GEOL 1110; GEOL 3410; GEOL4080; GEOL 3220; Hydrology; GEOL 3530; GEOL 3540
14	<u>2020</u>	1	Front podium stereomicroscope with camera Purchased via P-Card Feb 26, 2021	Observation, description and instruction of live organisms is very difficult without everyone seeing the same images at the same time as the organisms move across views. Having something students can take pictures with, etc. would greatly improve instruction.	\$4,680	II, III	Meiofauna, limnology, entomology, parasitology, etc.
15	<u>2008</u>	1	Total Organic Carbon Analyzer	Modernize/improve microbiology & ESC labs	\$34,000	III	BIOL 4220L, 4010L, 4040L, + graduate equivalent courses
16	<u>2006</u>	1	Electric Winch	Safety – self rescue from remote sites	\$3,500	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
17	<u>2006</u>	1	Honda Four Trax 4X4	Access to remote field sites	\$7,243	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
18	<u>?</u>	1	UTC Hybrid 4X4 Field Consortium Vehicle John Tucker attempted to purchase this in Spring 2021, but there was a shortage of vehicles and	Access to remote field sites (multiple seating required)	\$38,535	III	Field oriented courses In BIOL, ESC, CHEM,

			process was started too late. Need to follow-up on this				GEOL
19	<u>2014</u>	1	Liquid Scintillation Counter	Needed to replace old, broken unit Radioactive Materials Lab Equipment Committee wants to know if there are ways to demonstrate the same concepts with using smaller/less expensive instruments. Are there different ways to accomplish the same goals?	\$34,744	I, II, III	BIOL 4430, 4530, ESC 5030, 5040, 5997, 5998, 5999
20	<u>2016</u>	24	Apple MacBook laptop computers	Est. of a mobile computer lab that could be checked out by BGES faculty	\$38,376 (24 x \$1,599)	I, II, III	Any BGE course, especially: BIOL 3250, 3260, 3350, 3060, 3070
21	2021	24	Stereomicroscopes	NA	NA	NA	Any lab taught in 228 Holt
			TOTAL		\$370,639.00		

Table 6.

2019 – Carry Over From 2018

CATEGORIES OF EQUIPMENT:

- I. Equipment needed to maintain course instructional integrity
- II. Equipment needed to meet existing infrastructure deficiencies
- III. Equipment needs to meet continuing student/faculty research objectives

Rank	Fiscal Year Added to List	Quantity	Item	Justification	Cost	Category	Courses impacted
1	?	1	Multiprobe water quality field kits	Modernize/improve environmental science labs	\$6,000	I	BIOL 3070 BIOL/ESC 4520 ESC 1500L, 1510L
2	?	1	Analytical balances	Modernize/improve toxicology labs	\$6,000	I, II	BIOL/ESC 4380
3	?	2	Electronic balances	Modernize/improve intro biology labs	\$1000 total (2 x \$500)	II	BIOL 1110
	Cheryl decided we didn't need any more in the intro labs – we received some from STEM in Fall 2018						
4	2017	1	Leica Microscope	Updating Geology lab abilities	\$5,000	I,II,III	GEOL 1120, 3410, 3420, 3540, 4500, 4800
5	?	1	Utility building	Space to store teaching & research field equipment	\$1,951	II, III	Field oriented courses In BIOL & ESC

6	<u>2008</u>	1	Total Organic Carbon Analyzer	Modernize/improve microbiology & ESC labs	\$30,000	III	BIOL 4220L, 4010L, 4040L, + graduate equivalent courses
7	<u>2006</u>	1	Electric Winch	Safety – self rescue from remote sites	\$3,500	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
8	<u>2006</u>	1	Honda Four Trax 4X4	Access to remote field sites	\$7,243	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
9	<u>?</u>	1	UTC Hybrid 4X4 Field Consortium Vehicle	Access to remote field sites (multiple seating required)	\$38,535	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
10	<u>2014</u>	1	Liquid Scintillation Counter	Needed to replace old, broken unit Radioactive Materials Lab	\$34,744	I, II, III	BIOL 4430, 4530, ESC 5030, 5040, 5997, 5998, 5999
11	<u>2016</u>	24	Apple MacBook laptop computers	Est. of a mobile computer lab that could be checked out by BGES faculty	\$38,376 (24 x \$1,599)	I, II, III	Any BGE course, especially: BIOL 3250, 3260, 3350, 3060, 3070
12	<u>2016</u>	1	Fisher Isotemp Ultra-low (-80 C), undercounter freezer	For long-term storage of our bacterial culture collection – many of these cultures should not be stored with other teaching & research materials from diff. disciplines	\$8,884	I, II, III	BIOL 2100, 4220, 4280, 4530, 4430, ESC 4010, 4430, 5030, 5040
13	<u>2017</u>	1	Insect Cabinet for the Natural History Museum	The insect teaching collection is at capacity and cannot accommodate any new specimens. These cabinets are vital for the growth and well being of the collection.	\$3,883 (shipping incl.)	I, II, III	BIOL4070, BIOL4130, BIOL4999 (Parasitology)

14	<u>2017</u>	1	Equipment Needed to Develop Molecular ID Lab Exercise for Microbiology Teaching Labs	ID of bacterial cultures in research and industry is moving towards molecular techniques. Our micro teaching labs need to evolve to include these techniques	\$12,000 (for all equipment necessary)	I, II, III	BIOL 4220, BIOL 4530, BIOL 4430 ESC 4010, ESC 5030, ESC 4430, ESC 5040
15	<u>2018</u>	1	Petro Thin Section Machine	Replace the existing thin-section machine which is 13 years old and having troubles being maintained.	\$19,590	I,II,III	Petrology, Sed Stratigraphy, Econ Geol, Hist Geol, Geol of TN
16	<u>2018</u> Purchased May 3, 2019	1	Gel Documentation System	This instrument is used with most molecular assessments of gels demonstrating presence or absence of DNA bands. It is absolutely critical to research and teaching. The old unit is no longer working.	\$12,000	I,II,III	Genetics, Molecular Genetics, and others
17	2019	10	Microscope Cabinets/Cubbies	In order to have all teaching labs equipped with microscopes for each student to use during lab, there needs to be a place to store the microscopes. The cubbies purchased in 2017 seem to be working well.	\$9,845.00 (10 X 984.50)	I, II	All labs being taught in 123 Holt, 321 Holt
18	2019	1	Futura PLUS+ Series 9.0 cuft -40 chest freezer	Critical for pest control of Natural History Museum and Herbarium collections. Current -40 freezer isn't large enough to accommodate the amt. of specimens that need to be processed before placement in the collections.	\$5740 + shipping	I, II, III	All zoology and botany courses
19	2019	1	U85-22 -80 Freezer	Natural History Museum and Herbarium currently do not have a -80 freezer for long-term maintenance of DNA/biological samples. Needed to establish a permanent freezer collection for	\$9000 (shipping estimate included)	II, III	All zoology and botany courses

				future DNA extractions and DNA library.			
20	2019	35	Student Compound Microscopes – such as Olympus CX33	321 Holt does not have enough compound scopes in the lab for every student to be using one. 123 Holt does not have any compound scopes. Adding microscopes to these rooms will make the teaching spaces usable for more courses.	\$74,676 Total (35 X \$2133.60 includes shipping)	I, II	All labs being taught in 123 Holt and 321 Holt
21	2019	35	Student Stereoscopes – such as Accuscope 3075-E-LED	321 Holt does not have enough compound scopes in the lab for every student to be using one. 123 Holt does not have any compound scopes. Adding microscopes to these rooms will make the teaching spaces usable for more courses.	\$42,175 Total (35 X \$1205.00)	I, II	All labs being taught in 123 Holt and 321 Holt
22	2019	8	Trinocular Teaching Compound Microscopes with Camera – such as Olympus CX41 and AU-600	Most teaching labs do not have this technology in the room. Having this would help instructors show students how to use microscopes and show students what they are supposed to be viewing in their scopes.	\$16,000 Total (8 x \$2000)	I, II	All labs being taught in about 8 different teaching labs.
			TOTAL		\$386,142.00		

Table 7.

2018 – Carry Over From 2017

CATEGORIES OF EQUIPMENT:

I. Equipment needed to maintain course instructional integrity

- II. Equipment needed to meet existing infrastructure deficiencies**
III. Equipment needs to meet continuing student/faculty research objectives

Rank	Fiscal Year Added to List	Quantity	Item	Justification	Cost	Category	Courses impacted
1	?	1	Multiprobe water quality field kits	Modernize/improve environmental science labs	\$6,000 total	I	BIOL 3070 BIOL/ESC 4520 ESC 1500L, 1510L
2	2012	1	Clear View Storage Cabinet	Nat. History. Museum – Replacement of old wooden shelves	\$470	I, II, III	BIOL 4070, 4130, 4050, 4090, 4110, 4140, 4170
3	?	5	Analytical balances	Modernize/improve toxicology labs	\$30,000 total (5 x \$6,000)	I, II	BIOL/ESC 4380
4	?	1	UTC Hybrid 4X4 Field Consortium Vehicle	Access to remote field sites (multiple seating required)	\$38,535	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
5	?	6	Electronic balances	Modernize/improve intro biology labs	\$3000 total (6 x \$500)	II	BIOL 1110
6	?	1	Utility building	Space to store teaching & research field equipment	\$1,951	II, III	Field oriented courses In BIOL & ESC

7	<u>2008</u>	1	Total Organic Carbon Analyzer	Modernize/improve microbiology & ESC labs	\$30,000	III	BIOL 4220L, 4010L, 4040L, + graduate equivalent courses
8	<u>?</u>	1	Electric Winch	Safety – self rescue from remote sites	\$3,500	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
9	<u>?</u>	1	Honda Four Trax 4X4	Access to remote field sites	\$7,243	III	Field oriented courses In BIOL, ESC, CHEM, GEOL
10	<u>2017</u>	1	Leica Microscope	Updating Geology lab abilities	\$5,000	I,II,III	GEOL 1120, 3410, 3420, 3540, 4500, 4800
11	<u>2014</u>	1	Liquid Scintillation Counter	Needed to replace old, broken unit in Spratt's lab	\$34,744	I, II, III	BIOL 4430, 4530, ESC 5030, 5040, 5997, 5998, 5999
12	<u>2016</u>	24	Apple MacBook laptop computes	Est. of a mobile computer lab that could be checked out by BGES faculty	\$38,376 (24 x \$1,599)	I, II, III	Any BGE course, especially: BIOL 3250, 3260, 3350, 3060, 3070
13	<u>2016</u>	1	Fisher Isotemp Ultra-low (-80 C), undercounter freezer	For long-term storage of our bacterial culture collection – many of these cultures should not be stored with other teaching & research materials from diff. disciplines	\$8,884	I, II, III	BIOL 2100, 4220, 4280, 4530, 4430, ESC 4010, 4430, 5030, 5040
14	<u>2017</u> Purchased January 22, 2019	1	Eppendorf 5424 Microcentrifuge	Microbiological labs needing to use microcentrifuges must use the Genetics equipment. Increasing number of Microbiology labs require a dedicated unit	\$2,500	I, II, III	BIOL 4220, 4280, 4530, 4430, ESC 4010, 4430, 5030, 5040
15	<u>2017</u>	1			\$17,000	I, II, III	

	Acquired New Brunswick system from STEM February 15, 2019		Eppendorf I 2500 Series, Floor Model Incubating Platform shaker + Accessories	Microbiology labs must use shaking incubators for many culture needs. The units now in the lab are old and too small for growing lab needs.			BIOL 2100, 4220, 4280, 4530, 4430, ESC 4010, 4430, 5030, 5040
16	<u>2017</u>	1	Insect Cabinet for the Natural History Museum	The insect teaching collection is at capacity and cannot accommodate any new specimens. These cabinets are vital for the growth and well being of the collection.	\$3,883 (shipping inc.)	I, II, III	BIOL4070, BIOL4130, BIOL4999 (Parasitology)
17	<u>2017</u>	1	Equipment Needed to Develop Molecular ID Lab Exercise for Microbiology Teaching Labs	ID of bacterial cultures in research and industry is moving towards molecular techniques. Our micro teaching labs need to evolve to include these techniques	\$12,000 (for all equipment necessary)	I, II, III	BIOL 4220, BIOL 4530, BIOL 4430 ESC 4010, ESC 5030, ESC 4430, ESC 5040
18	<u>2018</u>	1	Petro Thin Section Machine	Replace the existing thin-section machine which is 13 years old and having troubles being maintained.	\$19,590	I,II,III	Petrology, Sed Stratigraphy, Econ Geol, Hist Geol, Geol of TN
19	<u>2018</u>	1	Gel Documentation System	This instrument is used with most molecular assessments of gels demonstrating presence or absence of DNA bands. It is absolutely critical to research and teaching. The old unit is no longer working.	\$12,000	I,II,III	Genetics, Molecular Genetics, and others
20	2019	10	Microscope Cabinets/Cubbies Ask if geology teaching labs would need something like this.	In order to have all teaching labs equipped with microscopes for each student to use during lab, there needs to be a place to store the microscopes. Ones purchased in 2017 seem to be working well.	\$9,845.00 (10 X 4984.50)	I, II	All labs being taught in 123 Holt, 228 Holt and 330 Holt

21	2019	11	Futura PLUS+ Series 9.0 cuft -40 chest freezer	Critical for pest control of Natural History Museum and Herbarium collections. Current -40 freezer isn't large enough to accommodate the amt. of specimens that need to be processed before placement in the collections.	\$5740 + shipping (Qty=1)	I, II, III	All zoology and botany courses
22	2019	12	U85-22 -80 Freezer	Natural History Museum and Herbarium currently do not have a -80 freezer for long-term maintenance of DNA/biological samples. Needed to establish a permanent freezer collection for future DNA extractions and DNA library.	\$9000 (shipping estimate included) (Qty=1)	II, III	All zoology and botany courses
			TOTAL		\$317,475		

Appendix 5-C

Last Name	First Name	Purpose	Manufacturer	Model	Type	Purchase Date
Tucker	John	Secondary	Dell	Inspiron 8100	Laptop	1-Jul-02
Barbosa	Jose	Lab	Dell	Latitude C640	Laptop	7-Oct-02
Wilson	Thomas	Lab	Dell	Latitude C640	Laptop	7-Oct-02
Spratt	Henry		Dell	Optiplex GX270	Desktop	8-Oct-03
Bramblett	Jeremy	Secondary	Dell	Inspiron 710	Laptop	11-Apr-06
		Dept-Equipment	Dell	Optiplex GX620	Desktop	22-Aug-06
Shaw	Joey	Lab	Dell	Optiplex 745	Desktop	1-Aug-07
Shaw	Joey	Lab	Dell	Optiplex 745	Desktop	1-Aug-07
Tucker	John	Secondary	Apple	iMac 24"	Desktop	23-May-08
Spratt	Henry	Secondary	Apple	iMac 24"	Desktop	6-Mar-09
		Dept	Apple	iMac 24"	Desktop	26-Aug-09
Craddock	Hill	Secondary	Dell	Latitude E6500	Laptop	14-Jan-10
Richards	Sean	Secondary	Apple	MacBook Pro 13"	Laptop	1-Oct-10
Tucker	John	Secondary	Apple	MacBook Pro 15"	Laptop	28-Jan-11
Klug	Hope	Lab	Apple	iMac 27"	Desktop	19-Sep-11
Hayes	Loren	Lab	Dell	Latitude E6520	Laptop	17-Jan-12
Klug	Hope	Lab	Apple	iMac 27"	Desktop	22-Mar-12
Spratt	Henry	Lab	Apple	iMac 27"	Desktop	20-Mar-13
Barbosa	Jose	Lab	Apple	iMac 27"	Desktop	5-Apr-13
Boyd	Jennifer	Secondary	Apple	MacBook Air 13"	Laptop	7-May-13
Carver	Ethan	Secondary	Apple	iMac 27"	Desktop	16-Jul-13
Spratt	Henry	Secondary	Apple	iMac 27"	Desktop	16-Jun-14
Hayes	Loren	Secondary	Dell	XPS 15"	Laptop	31-Dec-14
Murphy	Cheryl	Chemical Inventory Compt	Apple	iMac 21.5"	Desktop	25-Mar-15
Gaudin	Timothy	Primary	Apple	MacBook Pro 15"	Laptop	1-May-15
Chatzimanolis	Stylios	Lab	Apple	iMac 27"	Desktop	7-Jul-16

Brock-Hon	Amy	Secondary	Apple	iMac 27"	Desktop	8-Jul-16
Beasley	DeAnna	Secondary	Apple	iMac 27"	Desktop	5-Aug-16
Taylor	Jennifer	Secondary	Apple	iMac 27"	Desktop	12-Aug-16
Hossain	Azad	Secondary	MSI	WS72 6QJ-026US 17.3"	Laptop	30-Aug-16
		Lab	Apple	iMac 27"	Desktop	1-Sep-16
Hossain	Azad	Secondary	Dell	Mobile Precision 7710	Laptop	6-Oct-16
Kinnear	Katherine	Secondary	Apple	iMac 27"	Desktop	17-May-17
Beasley	DeAnna	Lab	Apple	iMac 21.5"	Desktop	6-Jun-17
Boyd	Jennifer	Secondary	Apple	MacBook Pro 13"	Laptop	7-Dec-17
Boyd	Jennifer	Lab	Apple	MacBook Pro 13"	Laptop	30-Apr-18
Boyd	Jennifer	Lab	Apple	MacBook Pro 13"	Laptop	30-Apr-18
Boyd	Jennifer	Lab	Apple	MacBook Pro 13"	Laptop	30-Apr-18
Klug	Hope	Lab	Apple	MacBook Pro 13"	Laptop	30-Apr-18
Qin	Hong	Lab	Apple	MacBook Pro 13"	Laptop	30-Apr-18
Sharma	Ritu	Lab	Apple	MacBook Pro 15"	Laptop	3-May-18
Tucker	John	Primary	Apple	MacBook Pro 13"	Laptop	11-Jun-18
Gaudin	Timothy	Secondary	Apple	iMac 27"	Desktop	22-Jun-18
Leasi	Francesca	Primary	Apple	iMac 27"	Desktop	23-Aug-18
		Dept	Apple	iMac 27"	Desktop	18-Feb-19
Adams	Callie	Primary	Apple	MacBook Pro 15"	Laptop	3-May-19
Bramblett	Jeremy	Secondary	Apple	iMac 27"	Desktop	6-May-19
Hayes	Loren	Primary	Apple	iMac 27"	Desktop	7-May-19
Salazar	Wendy	Primary	Apple	iMac 27"	Desktop	7-May-19
Chatzimanolis	Stylianios	Lab	Apple	Mac Mini	Destop	27-Jul-19
Jarvis	Caitlin	Primary	Apple	MacBook Pro 15"	Laptop	21-Aug-19
Hayes	Loren	Lab	Apple	MacBook Pro 15"	Laptop	23-Sep-19
Shaw	Joey	Lab	Dell	Precision 5820	Desktop	23-Sep-19
Leasi	Francesca	Lab	Apple	MacBook Pro 13"	Laptop	20-Nov-19
Boyd	Jennifer	Primary-prior	Apple	MacBook Pro 13"	Laptop	27-Nov-19
		Dept	Dell	XPS 15 7000 Series-7590		27-Feb-20
Leasi	Francesca	Office	Apple	MacBook Pro 15"	Laptop	19-Mar-20

		Dept	Apple	MacBook Pro 13"	Laptop	27-Mar-20
Hossain	Azad	Lab	Dell	XPS 15"	Desktop	15-May-20
Bramblett	Jeremy	Primary	Apple	iMac 27"	Desktop	27-Sep-20
Richards	Sean	Secondary	Apple	MacBook Pro 16"	Laptop	3-Feb-21
Shaw	Joey	Primary	Apple	MacBook Pro 16"	Laptop	15-Mar-21
Boyd	Jennifer	Primary	Apple	MacBook Pro 13"	Laptop	22-Mar-21
Klug	Hope	Primary	Apple	MacBook Pro 13"	Laptop	30-Mar-21
Manning-Berg	Ashley	Secondary	Microsofft	Surface Pro 7+	Tablet	20-Apr-21
Hayes	Loren	Lab	Apple	MacBook Pro 16"	Laptop	17-May-21
Locke	Kelly	Primary	Apple	MacBook Pro 13"	Laptop	26-May-21
		Geology Teaching Computer	Apple	MacBook Pro 13"	Laptop	22-Oct-21
		Dept	Apple	MacBook Pro 14"	Laptop	13-Jan-22
Klug	Hope	Lab	Apple	iMac 24"	Desktop	25-May-22
Klug	Hope	Lab	Apple	iMac 24"	Desktop	25-May-22
Ferdoush	Jannatul	Primary	Apple	MacBook Pro 14"	Laptop	1-Jun-22
Murphy	Cheryl	Primary	Apple	iMac 24"	Desktop	25-Aug-22
Beasley	DeAnna	Primary	Apple	iMac 24"	Desktop	26-Sep-22
Brock-Hon	Amy	Primary	Apple	iMac 24"	Desktop	26-Sep-22
Giles	David	Primary	Apple	MacBook Pro 14", 2021	Laptop	26-Sep-22
Taylor	Jennifer	Secondary	Apple	iMac 24"	Desktop	26-Sep-22
Richards	Sean	Primary?	iMac	24"	Desktop	31-Oct-22
Spratt	Henry	Primary	Apple	MacBook Pro 14", 2021	Laptop	16-Nov-22
Giles	David	Lab	Apple	iMac 24"	Desktop	24-May-23
Taylor	Jennifer	Primary	Apple	MacBook Pro 14"	Laptop	26-May-23
Manning-Berg	Ashley	Lab	Dell	Precision 5820 Tower XCTO Base	Desktop	7-Jun-23
Hossain	Azad	Lab	Dell	Precision Workstation 3581	Laptop	22-Aug-23
Hayes	Loren	Research Computer	Apple	Mac Mini A2626	Desktop	7-Sep-23
Craddock	Hill	Lab	Apple	iMac 27"	Desktop	Spring 2017

Appendix 5-D

Department of Biology, Geology and Environmental Science

Chemical Hygiene Plan

Revised: July 2023

Table of Contents

List of Department and University Contacts.....	2
Purpose of the Chemical Hygiene Plan.....	3
Personnel Responsibilities.....	4
Applicable Areas.....	5
Standard Operating Procedures.....	7
Chemical Labeling.....	12
Laboratory Safety Controls.....	13
Hazardous Waste Disposal.....	16
Record Keeping.....	17
Training.....	18
Chemicals Requiring Approval For Use.....	19
Medical Consultations and Examinations.....	20
Radiation Safety.....	21
Glossary.....	24
References.....	25
Biosafety.....	26
Biohazard Waste.....	27

I. LIST OF DEPARTMENT AND UNIVERSITY CONTACTS

In case of imminent danger to life and safety, **dial 911** from any campus phone, or 423-425-HELP (4357) from any cell phone. Do not dial 911 from a cell phone, as this is routed to the Hamilton County Dispatch, which must then reroute the call to UTC and will result in a delayed response.

Contact	Position	Office/Location	Phone Number	Email
Jessica Sanders	Dept. Chemical Hygiene & Safety Officer; Dept. Emergency Management Officer	214 Holt	423-362-9088	Jessica-Sanders@utc.edu
Dr. Gretchen Potts	Head, Dept. BGES	215 Holt	423-425-4341	Gretchen-Potts@utc.edu
Mr. Robert Mullins	UTC Health & Safety Supervisor	103 Admin. Services	423-425-5820	Robert-Mullins@utc.edu
Mr. Tim Pridemore	UTC Emergency Management Specialist	103 Admin. Services	423-425-2297	Tim-Pridemore@utc.edu
Office of Safety and Risk Management (main office)		103 Admin. Services	423-425-5741	
Mr. Jack Pitkin	UTC Radiation Safety Officer	215A Grote	423-425-4518	Jack-Pitkin@utc.edu
Poison Control Center			800-222-1222	

In case of emergency, the faculty member in charge of the room or area where the situation exists should be contacted. This information is required to be posted on the door placard outside of all laboratory rooms in the Department of Biology, Geology & Environmental Science.

II. PURPOSE OF THE CHEMICAL HYGIENE PLAN

(29 CFR 1910. 1450 (e)) The development and implementation of a written Chemical Hygiene Plan (CHP) is the foundation of compliance required by the Occupational Safety and Health Administration (OSHA) as stated in the publication Occupational Exposure to Hazardous Chemicals in Laboratories (Federal Register, January 31, 1990, pages 3327-3335, part of CFR 1910) (https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=Standards&p_id=10106).

These rules have also been adopted by the Tennessee Occupational Safety and Health Administration (TOSHA). Additionally, The University of Tennessee at Chattanooga shall be subject to any rules on this subject adopted by TOSHA at a subsequent time.

This rule and standard apply to all persons, including University employees, students, and visitors, authorized to be present in laboratories maintained by the Department of Biology, Geology and Environmental Science (BGE). All persons subject to the CHP shall be informed of the locations of the CHP, the availability of Safety Data Sheets (SDS), and other pertinent reference materials relating to their health and safety while in the laboratory. Application of the CHP follows University of Tennessee Policies on Safety and Health, Subject H, Laboratory Safety.

The CHP shall be reviewed and evaluated for its effectiveness annually by the Department Chemical Hygiene Officer (CHO) and the Chief Chemical Hygiene Officer for the University of Tennessee at Chattanooga (UTC).

The University of Tennessee at Chattanooga is committed to providing a safe working environment and believes employees have a right to know about health hazards associated with their work. All employees have access to pertinent safety information through their supervisory staff. When safety concerns arise, employees are encouraged to contact their supervisor.

It is important that employees assume responsibility for laboratory safety. The people who work in each laboratory are best able to detect potential hazards. So that employees can make knowledgeable decisions about the personal risks of employment, this Chemical Hygiene Plan includes policies, procedures, and responsibilities designed to encourage an awareness of potential hazards in the workplace and to train employees in the development of appropriate, safe working conditions. A training program has been designed for the benefit and protection of all laboratory employees.

III. PERSONNEL RESPONSIBILITIES

A. University Chemical Hygiene Officer

The University CHO for UTC coordinates the Campus Chemical Hygiene Program within University guidelines and has the responsibility to:

- Perform periodic reviews, at least annually, of department CHPs and help prepare revisions to keep the CHP current relative to changes in regulations and University safety policy.
- Conduct annual safety inspections of the laboratories and report their findings to the Departmental CHO. As part of these inspections, the University CHO will test emergency equipment, including fume hoods, eyewash stations and safety showers.
- Coordinate the necessary activities required to ensure that an adequate emergency reaction response capability exists within each department.
- Coordinate a program to ensure that all hazardous materials information resources required by regulations are available to department employees and that the contents of these materials are current.
- Oversee training of department employees to ensure compliance with safety regulations. Laboratory employees should have adequate job orientation so that they may protect themselves against the potential adverse effects of exposure to hazardous chemicals.
- Coordinate necessary medical consultations to satisfy the requirement of the medical consultation and medical examination sections of the standard.
- Coordinate the arrangements of all required employee monitoring to satisfy the requirements of the employee exposure determination section of the standard.
- Coordinate the implementation of the approval procedure for those substances that are designated as requiring prior approval before use.
- Coordinate all other activities that are shown to be necessary to ensure compliance with all aspects of the standard.

To assure compliance with the University of Tennessee Safety Policies, the University CHO has the authority to initiate actions closing down a laboratory if the safety requirements of the Departmental CHP are not met.

B. Department Chemical Hygiene Officer

The Department CHO has the primary responsibility of ensuring the implementation of the provisions of the Chemical Hygiene Program within the Department and perform duties to include:

- Know and understand the requirements of the OSHA Laboratory Standard regulation (29CFR 1910.1450) and the Department CHP.
- Work with Laboratory Supervisors and other employees to develop and implement appropriate chemical hygiene policies and practices.
- Monitor the proper procurement, use and disposal of chemicals in the Department.
- Inform Laboratory Supervisors of chemical-related health and safety requirements and assist with the selection of appropriate safety controls, including laboratory and other workplace practices and procedures, training, and personal protective equipment.
- Seek ways to improve the CHP.
- Know the current legal requirements concerning regulated substances.
- See that appropriate audits are maintained.
- Conduct periodic inspections and take immediate steps to abate hazards that may pose a risk to life or safety upon discovery of such hazards.
- Certify the performance of protective equipment.
- Conduct hazard assessments upon request.
- Annually review and evaluate the effectiveness of the CHP and make updates as appropriate.

C. Laboratory Supervisors

Safety responsibilities for a specific laboratory rest with the faculty or staff member designated by the Department CHO and approved by the Department Head. The designated person must:

- Work with the Department CHO and other employees to develop and implement appropriate chemical hygiene policies and practices.
- Monitor the proper procurement, use, and disposal of chemicals in the laboratory.
- See that appropriate audits are maintained.
- Help project directors develop precautions and adequate facilities.
- Seek ways to improve the CHP.
- Provide regular chemical hygiene and housekeeping inspections including routine inspections of emergency equipment.
- Know the current legal requirements concerning regulated chemicals and the need for protective equipment.
- The laboratory supervisor has the overall responsibility to ensure that students and employees working in their laboratory:
 1. Understand and follow the chemical hygiene rules.
 2. Have working protective equipment available.
 3. Are provided with adequate training.

D. Laboratory Employees, Students and Visitors

All laboratory employees, students and visitors working in the laboratory must:

- Receive training at the time of their initial assignment to a work area where hazardous chemicals are present.
- Conduct each laboratory operation in accordance with the institutional chemical hygiene procedures.
- Develop good personal chemical hygiene habits.
- Follow exactly his or her supervisor's safety instructions, provided it does not conflict with established safety guidelines.
- Be aware of the hazards of the chemicals they are working with and how to handle those chemicals in a safe manner.
- Report any spills, accidents, or conditions that could lead to an accident involving hazardous chemicals to the Laboratory Supervisor or Department CHO.

IV. APPLICABLE AREAS

The rules, regulations, and guidelines set forth in this Chemical Hygiene Plan shall apply to all teaching and research laboratories and any spaces that contain hazardous chemicals within the Department of Biology, Geology and Environmental Science at University of Tennessee at Chattanooga.

V. STANDARD OPERATING PROCEDURES

General precautions for handling all laboratory chemicals should include minimizing exposure because few laboratory chemicals are without hazard. Any mixture of hazardous chemicals is assumed to be more toxic than the most toxic component.

A. Procedures for Working with Chemicals

1. Accidents and spills.

In all cases, consult the SDS for the respective chemicals. The SDS may be found in the SDS notebook within the laboratory. Safety Data Sheets can also be found in the master SDS file, located in 214 Holt.

- **Eye contact:** Promptly flush eyes with water for 15 minutes and seek medical attention.
- **Ingestion:** Consult the SDS or Poison Control Center. Each chemical will affect the body differently. Seek immediate medical attention.
- **Skin contact:** Promptly flush the affected area with water for 15 minutes. In case of a spill over a large portion of the body, use the safety shower. Remove affected clothing. If symptoms persist after washing, seek medical attention.
- **Clean-up:** *The Department CHO is to be immediately notified of any large spills.* Promptly clean up spills using appropriate spill control materials and personal protective equipment. Dispose of clean-up materials properly. If possible, spill containment and remediation should be performed by the Laboratory Supervisor. If there is any question about how to clean a spill, consult the chemicals' SDS and the Department CHO. In case of severe health hazards, notify the Department CHO, who will contact the UTC CHO, as necessary.

2. Avoid unnecessary exposure to hazardous chemicals.

- Never eat, drink, smoke, vape or apply cosmetics in areas where laboratory chemicals are present.
- Storing, handling, or consuming food or beverages in a laboratory or chemical storage area is prohibited. The use of laboratory glassware, utensils, or refrigerators for foodstuff that will be consumed is also prohibited.
- Ensure that appropriate eye protection is worn by all persons, including students and visitors, in areas where chemicals are stored or used.
- Wear appropriate gloves when the potential for contact with toxic chemicals exists. Inspect the gloves before each use, wash before removal (where appropriate), and replace as needed.
- Use properly fitted respiratory equipment when air contaminant concentrations are not sufficiently restricted by fume hoods. Inspect the respirator before each use.
- Do not smell or taste chemicals.
- Use only those chemicals for which an adequate ventilation system is available. Apparatus that discharges toxic chemicals (vacuum pumps, distillation columns, etc.) should be vented into local exhaust devices.
- Do not use mouth suction for pipetting or to start a siphon.
- Use protective and emergency apparel and equipment when appropriate.
- If contact lenses are worn in the laboratory, inform the Laboratory Supervisor so special precautions can be taken in the event of eye injury.
- Remove laboratory coats immediately upon contamination and dispose of properly.
- Wash areas of exposed skin before leaving the laboratory.

3. Follow standard laboratory safety protocols.

- All chemicals should be properly labeled and stored.
 - *Keep all oxidizing agents at least 10' away from flammables and solvents.* All chemicals should be stored in secure containers within enclosed cabinets, if possible.
 - Flammables and acids should be stored in authorized, appropriate storage cabinets.
 - Store flammable solvents and acids separately.
 - Keep all large quantity containers within appropriate storage cabinets. After removing the needed amount from a large container, return the container to the appropriate storage cabinet.
 - All chemicals should be monitored monthly to ensure effective status and continued safety measures. For example, picric acid crystals should be kept moist. *Immediately request disposal of expired chemicals.*
 - Keep the work area clean and uncluttered; clean up the work area on completion of an operation or at the end of each day.
 - Do not use damaged glassware. Handle and store laboratory glassware with care to avoid damage.
 - Dispose of broken or damaged glassware in a designated broken glass receptacle. Broken glassware may not be discarded in the regular trash.
 - Use a fume hood for operations that might result in the release of toxic chemical vapors or dust. Use a fume hood or other local ventilation device when working with any moderately volatile substance with a TLV of less than 50 ppm.
 - Keep materials stored in fume hood to a minimum; do not allow materials to block vents or air flow. Leave the fume hood on if toxic substances are stored in it or if needed to augment laboratory ventilation.
-
- Always wear close-toed shoes in the laboratory.
 - Confine long hair or loose clothing.
 - Horseplay, disorderly conduct, or use of abusive language in the laboratory is prohibited.
-
- Seek information about hazards and plan appropriate protective procedures before beginning a new operation. Consult the SDS or laboratory manual if in doubt about appropriate procedures for a specific chemical.
 - In the event of failure of a utility service, leave lights on, place an appropriate sign on the door, and notify the Department CHO.
 - If questionable hazardous conditions are found, immediately notify the Laboratory Supervisor and/or Department CHO to remedy the situation.
 - Properly label all chemicals before placing in Hazardous Waste Room (108 Holt), including a list of all chemicals in the container. Do not mix questionable agents (e.g., organics with nitric acid or oxidizers).
 - Requests for ordering chemicals should be submitted to the Department CHO. The Department CHO must be aware of all chemicals entering the department so that proper handling, monitoring, record keeping, and training can be accomplished in a timely manner.
 - A current SDS manual is maintained in 214 Holt. Review the appropriate SDS regarding any question about handling, storage or disposal of a specific substance.
 - Be aware of unsafe conditions and see that they are corrected.
 - Unauthorized persons, children or pets are prohibited in laboratories.

B. Housekeeping

Custodial employees of UTC Facilities Planning & Management should not be entering BGE laboratories for housekeeping purposes. Housekeeping for each laboratory is the responsibility of the Laboratory Supervisor.

The Laboratory Supervisor should conduct regular housekeeping inspections to assess the following:

- Non-hazardous trash is deposited in appropriate receptacles. Once the receptacles are full, they are placed in the hallway for custodians to empty.

- Broken glass and sharps must be placed in a separate labeled receptacle. Once the receptacle is $\frac{3}{4}$ full, completely seal the receptacle. The Laboratory Supervisor should take the receptacle to the nearest dumpster. Custodians do not dispose of broken glass.
- Chemical spills are promptly reported to the Department CHO. Custodians DO NOT clean up any type of chemical spill.
- Proper storage of chemicals, equipment and supplies are maintained to minimize clutter.
- Custodians do not clean counter tops. It is the responsibility of the Laboratory Workers, Students and Laboratory Supervisor to clean all counter tops and upper surfaces in the laboratory area.
- Hazardous and biohazardous waste should be disposed of properly. See sections VIII and XVII for further information.

C. Chemical Inventory

A current chemical inventory for each laboratory is maintained by the Department CHO. When the Department CHO receives the ordered chemical, the container is labeled with a receive date, and pertinent information is added to the department chemical inventory.

Annually, in coordination with the Department CHO, the Laboratory Supervisor will update the chemical inventory in their laboratories and provide the Department CHO with a copy. The Department CHO will forward a complete department chemical inventory to the UTC CHO within the Office of Safety and Risk Management (OSRM), annually, no later than January 31st of each year.

A chemical inventory is performed annually, listing all the hazardous chemicals in the laboratory. Chemicals listed are those classified as hazardous by the Department of Transportation (DOT), the Environmental Protection Agency (EPA), or displaying a 2 or greater in any section of the National Fire Protection Association (NFPA) diamond.

Chemicals are listed alphabetically along with the CAS, manufacturer's name, catalog number, container size and type, location, storage designation, receive date and expiration date. Chemicals stored in secondary containers are not included on the chemical inventory.

Inventories are currently listed in excel spreadsheets. There is one file per building in BGE and within each file, a worksheet for each room. A complete chemical inventory is in the office of the Department CHO, the UTC CHO, as well as the local fire department and the State Department of Labor (TOSHA).

When chemical inventories are kept current it serves the purpose of keeping tighter control over chemicals within laboratory areas, prevents excessive stockpiling of chemicals, thereby reducing the hazards involved, as well as saving money by purchasing only needed chemicals.

D. Safety Data Sheets

Each laboratory (and any other spaces with hazardous chemicals) will have a current SDS notebook. The SDS notebook needs to be easily found and accessible to anyone working in the laboratory. Upon request by the Laboratory Supervisor, an electronic folder that contains the SDSs may be uploaded to a laboratory computer. This is in addition to the SDS notebook and not a substitute for the hard copy. The electronic copy should be easily

available to anyone working in the laboratory at any time. The SDSs are kept in alphabetical order within the notebook.

A master department SDS folder is in 214 Holt. The SDSs are kept in alphabetical order within the folder. The Department CHO is responsible for updating the SDS file (both master and laboratory) as new materials are procured.

Whenever a new chemical is introduced into the laboratory, immediately notify the Department CHO so that proper training may be completed prior to the use of the chemical. In most cases, this will only involve the review of the SDS to determine the proper handling of the chemical. At this time the Department CHO will determine if any special protective devices or procedures are required.

E. Chemical Storage

BGE Chemical Storeroom is in 106 Holt. This is also the location where newly purchased and inventoried chemicals are located. The Department CHO notifies the Laboratory Supervisor when the item is available for retrieval and relocation to their laboratories.

1. General Chemical Storage

- Chemical storage areas within laboratories should be minimized. Each chemical in the laboratory must be stored in a specific location and returned there after each use. Acceptable storage locations may include:
 - o Flammable cabinets
 - o Corrosive cabinets
 - o Laboratory shelves: with $\frac{3}{4}$ " lip on open shelving, otherwise within shelving that has doors to prevent falling off the shelf.
 - o Appropriate laboratory refrigerators or freezers: *no food is permitted where chemicals are stored.*
- Fume hoods should not be used as permanent chemical storage areas. Not only does this create potentially unsafe conditions by having extraneous chemicals stored near chemical reactions and processes, excess chemical bottles in the hood may also seriously impair the ventilating capacity of the hood. Only chemicals being used in the process or experiment being conducted in the hood are allowed to be stored in the hood. They should also be removed when the process or experiment is complete.
- Chemicals should not be permanently stored on bench tops. Avoid storing any chemical containers on the floor. Chemical containers should not be stored in aisles, corridors or in front of doors.
- Chemicals should not be stored above eye level.
- Periodic clean-outs of expired or unneeded chemicals should be conducted to minimize the volume of hazardous chemicals stored in the laboratory.
- Always follow the chemical manufacturer's storage instructions, if provided.

2. Hazard Classes for Chemical Storage

Chemicals can be stored in alphabetical order only if they are in compatible chemical categories (hazard classes). Special attention must be paid to ensure that oxidizing agents and other reactive chemicals are not stored close to interactive agents. As of 2016, many manufacturers designate on container labels which hazard class the chemicals belong to via a color-coding system and GHS pictograms (29 CFR 1910.1200) (See Figures 1 & 2).

- Flammables
 - o Storage Code = Red; Pictogram = Flame
 - o No more than 10 gallons of flammable liquid is permitted to be stored outside of a flammable storage cabinet.

- Corrosives (Acids and Bases)
 - o Storage Code = White; Pictogram = Corrosion
 - o Caustic (corrosive) materials are defined as substances that cause destruction of living tissue by chemical corrosion at the site of contact and can be acidic or basic.
 - o Corrosives should be stored within a corrosive storage cabinet in which acids and bases are always segregated.
 - o Organic acids (e.g., acetic acid, formic acid) must be stored away from oxidizing acids (e.g., nitric acid, perchloric acid) as these are incompatible with each other.
 - Segregation is achieved by either physical distance (preferred method) or by secondary containment.

- Oxidizers
 - o Storage Code = Yellow; Pictogram = Flame Over Circle
 - o Oxidizers are materials that may cause or contribute to the combustion of other materials by yielding oxygen.
 - o Oxidizers should be stored in a designated storage cabinet.
 - o *Keep all oxidizing agents at least 10' away from flammables and solvents.*

- Poisons and Acutely Toxic Materials
 - o Storage Code = Blue; Pictograms = Health Hazard, Exclamation Mark and/or Skull and Crossbones
 - o Appropriate storage locations for poisonous and toxic materials include desiccators, designated storage cabinets and non-domestic refrigerators and freezers. These locations should be clearly posted.
 - o Best management practice dictates that acutely toxic materials should be always stored in secondary containment.
 - o A separate inventory list of carcinogens and suspected carcinogens is maintained by the Chemical Hygiene Officer to comply with federal and state regulations.

- Compressed Gases
 - o Pictogram = Gas Cylinder
 - o Gas cylinders of compressed gases will be strapped or chained to a wall or bench top.
 - o When not in use, gas cylinders should be capped.
 - o Cylinders that are in use, must be individually secured.

Figure 1. OSHA GHS Pictograms

Health Hazard  • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	Flame  • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	Exclamation Mark  • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder  • Gases Under Pressure	Corrosion  • Skin Corrosion/ Burns • Eye Damage • Corrosive to Metals	Exploding Bomb  • Explosives • Self-Reactives • Organic Peroxides
Flame Over Circle  • Oxidizers	Environment (Non-Mandatory)  • Aquatic Toxicity	Skull and Crossbones  • Acute Toxicity (fatal or toxic)

OSHA Accepted, Industry Standard Labeling System

GHS Compliant Label

Color-coded labels make safe storage simple

Pictograms:
Conveys specific information about the hazard(s) of a chemical

Signal Word:
Level of severity
of hazard.

Hazard Statements:
Describe the nature of hazard(s) associated with a chemical.

Precautionary Statements:
Recommended measures to take to prevent adverse effects

- **Health Hazard**
 - Carcinogen
 - Mutagenicity
 - Reproductive Toxicity
 - Respiratory Sensitizer
 - Target Organ Toxicity
 - Aspiration Toxicity
- **Gas Cylinder**
 - Gases Under Pressure
- **Flame Over Circle**
 - Oxidizers
- **Flame**
 - Flammables
 - Pyrophorics
 - Self-Heating
 - Emits Flammable Gas
 - Self-Reactives
 - Organic Peroxides

- Corrosion**
 - Skin Corrosion/Burns
 - Eye Damage
 - Corrosive to Metals
- Environment (non mandatory)**
 - Aquatic Toxicity
- Exclamation Mark**
 - Irritant (skin & eye)
 - Skin Sensitizer
 - Acute Toxicity (harmful)
 - Narcotic Effects
 - Respiratory Tract Irritant
 - Hazardous to Ozone Layer (non mandatory)
- Exploding Bomb**
 - Explosives
 - Self Reactives
 - Organic Peroxides
- Skull & Crossbones**
 - Acute Toxicity (fatal or toxic)

Emergency: **911**
Poison Control Center: _____
Location of SDS: _____
CHEMTREC: **800-424-9300**
Nearest Telephone Location: _____



Figure 2. Example of color-coding system for hazard classes. Low hazard storage codes are either green or gray (e.g., chemicals from Fisher Scientific have storage code gray).

VI. CHEMICAL LABELING

Specific labeling requirements are defined in the OSHA Hazard Communication Standard. Labels for primary containers (original chemical container) must not be removed or defaced. Every hazardous chemical used in the laboratory that is not in its original container (secondary container) must be labeled. At a minimum, these labels must contain the following information:

- Chemical name: Written, DO NOT use abbreviations or chemical symbols/formulas.
- Hazard class: Written or via GHS pictograms.
- User's name and date

VII. LABORATORY SAFETY CONTROLS

Laboratory safety controls include engineering controls, administrative controls and personal protective equipment (PPE). These controls should be used in a layered approach to minimize exposure to all personnel working in the laboratory. A best practice technique is based on the idea that the best way to control a hazard is to systematically eliminate it from the workplace or substitute a less hazardous technique, process or material. If elimination or substitution are not feasible options, incorporating these controls into everyday laboratory practice must be used. All personnel are responsible to follow administrative controls, use engineering controls and wear PPE correctly and effectively.

There are four primary routes of exposure in which hazardous substances can enter the body: inhalation, absorption, ingestion, and injection. The most likely of these routes of exposure in the laboratory are by inhalation and/or skin absorption (Purdue CHP 2014).

All chemical hygiene-related equipment is monitored by the Department CHO.

A. Engineering Controls

Engineering controls help reduce or eliminate exposures to hazardous chemicals via several routes, including:

- Substitution with less hazardous equipment, chemicals or processes (e.g. chemical storage cabinets for open shelving).
- Isolation of the operator or the process (e.g., use of glove-box).
- Use of forced ventilation systems (e.g., chemical fume hood, biological safety cabinet).

1. Chemical Fume Hoods

Chemical fume hoods are designed to limit exposure to hazardous or toxic fumes or vapors. To determine if a chemical is required to be used inside a chemical fume hood, first check the SDS for the chemical. In section 2 of the SDS, statements such as 'do not breathe dust, fumes or vapors' or 'toxic by inhalation' indicate a need for using a fume hood. The following guidelines for using chemical fume hoods must be always followed:

- Only chemicals and equipment essential to a specific procedure should be placed in the chemical fume hood. Once finished with the procedure, all chemicals and equipment should be removed.
- Chemical fume hoods should NOT be used for storage of chemicals and equipment.
- Do not block the vents or air flow baffles.
- Never put your head inside an operating chemical fume hood.
- Fume hoods are not designed to be used with biological materials.

All fume hoods are inspected annually and certified by OSRM. Any hood not passing inspection is taken out of service immediately and not used until the hood has passed inspection. It is the responsibility of the employer to purchase the parts and replace the unit in a timely fashion so that the risk to employees is minimized.

2. Biosafety Cabinets

Biosafety cabinets (BSC) are enclosed, ventilated laboratory workspaces for safely working with biological materials. The primary purpose of a BSC is to protect the laboratory worker and the surrounding environment from pathogens. Air is filtered as it exits the biosafety cabinet, removing harmful particles. BSCs are not designed to be used with chemicals.

All biosafety cabinets are inspected annually and certified by Department CHO via certification contractor. Any BSC not passing inspection is taken out of service immediately and not used until the BSC has passed inspection.

3. Safety Showers & Eyewash Stations

All laboratories using hazardous chemicals must have immediate access to safety showers and/or eyewash stations. Safety showers must always have a minimum clearance of 24 inches from the centerline of the spray pattern in all directions. Access must be always unobstructed. All lab personnel must be able to locate and properly use the safety shower and eyewash station.

When using the safety shower or eyewash station, flush the affected area for 15 minutes or until emergency personnel have arrived and begin treatment.

Safety showers and eyewash stations are inspected by the Department CHO and annually inspected, flushed and tested by OSRM; records are maintained by the OSRM.

4. Fire Extinguishers

All fire extinguishers should be mounted on a wall in an area free of clutter. Fire extinguishers are inspected monthly by the OSRM.

All lab personnel should know the location of the fire extinguishers in the laboratory.

5. Fire Doors

Laboratories may contain fire doors as part of the building design. These doors are an additional component of the fire containment system and should remain closed unless they are on a magnetic self-closure device. Never disable a fire door closure.

If you are unsure if your laboratory door is fire rated or not, contact the Department CHO.

B. Administrative Controls

Administrative controls are procedures that can be taken to reduce or eliminate hazards associated with the use of hazardous materials. The Laboratory Supervisor is responsible for the safe operation of the laboratories and will work with the Department CHO to provide appropriate administrative controls in their laboratories, which can include the following:

- Ensure that all personnel working the laboratory are provided with adequate documented training for safe work with hazardous materials.
- Development of SOPs for experiments that include safety measures.
- Restricting access to areas where hazardous materials are used.
- Labeling all chemicals.
- Use of safety signs and placards, including Emergency Contact Door Postings outside each laboratory door.
- Good housekeeping and good personal hygiene (e.g., hand washing, regular decontamination of work spaces).
- Prohibit eating and drinking where chemicals are used or stored.

Environmental monitoring is required in all laboratories that use any of the following chemicals (as listed in 29 CFR 1910 Sub-part Z) three or more times per week.

- 1910.1001 asbestos, tremolite, anthophyllite, and actinolite
- 1910.1002 coal tar pitch
- 1910.1003 4-Nitrobiphenyl
- 1910.1004 alpha-Naphtylamine
- 1910.1006 Methyl chloromethyl ether
- 1910.1007 3, 3'-dichlorobenzidine (and its salts)
- 1910.1008 bis-chloromethyl ether
- 1910.1009 beta-naphtylamine
- 1910.1010 benzidine
- 1910.1011 4-aminodiphenyl
- 1910.1012 ethyleneimine
- 1910.1013 beta-propiolactone
- 1910.1014 2-acetylaminofluorene
- 1910.1015 4-dimethylaminoazobenzene
- 1910.1016 N-nitrosodimethylamine
- 1910.1017 vinyl chloride
- 1910.1018 inorganic arsenic
- 1910.1025 lead
- 1910.1028 benzene
- 1910.1029 coke oven emissions
- 1910.1043 cotton dust
- 1910.1044 1, 2-dibromo-3-chloropropane
- 1910.1045 acrylonitrile
- 1910.1047 ethylene oxide
- 1910.1048 formaldehyde
- 1910.1101 asbestos

All spills are contained according to OSHA guidelines, and appropriate spill kits used. Spill kits are stored in BGE Chemical Storeroom (106 Holt) and laboratories, where appropriate.

Assessment of significant risk of all operations is made by the Laboratory Supervisor or Department CHO. Chemical Hygiene and safety policies will be established for each task performed and engineering controls for personal protective equipment assigned.

C. Personal Protective Equipment

Personal protective equipment (PPE) should be used to supplement engineering controls but is not a substitute for engineering controls when they are required. PPE must be worn at all times in the laboratory when handling hazardous materials.

Refer to Section 8 'Exposure Controls/Person Protection' of the SDS for the chemical(s) being used. This will provide basic information on the PPE recommended for use with that chemical.

1. Eye Protection

- **Safety Glasses/Safety Goggles:** Eye protection meeting ANSI Standard Z87.1-2003 is required in all laboratories when hazardous chemicals are in use.
- **Contact Lenses:** BGE does not prohibit the wearing of contact lenses in the laboratory. However, lab personnel should notify their supervisor that they wear contacts. Lab personnel should be made aware of the risks of wearing contacts in areas where hazardous chemicals are used, so they may make their own educated decision about continuing to wear them.

2. Skin Protection

- **Hand Protection:** Laboratory personnel are required to wear impervious gloves when the potential for contact with blood, bloodborne pathogens, infectious materials and/or hazardous chemicals exists. These gloves must be compatible with the type of hazard present.
- **Bodily Protection:** Where the potential for splashes/aerosols from blood, bloodborne pathogens, infectious materials hazardous chemicals exists, an impervious apron or lab coat appropriate for the task must be worn.
- **Clothing and Footwear:** In general, flat close-toed shoes with rubber soles and leather uppers should be worn in the laboratory. Open-toe shoes, flip flops, canvas shoes and sandals should be avoided. Long pants are preferable to shorts and skirts as these garments provide no protection to the legs from spills.

VIII. HAZARDOUS WASTE DISPOSAL

To ensure minimum harm to people and the environment from the disposal of waste laboratory chemicals, OSRM has created a waste disposal program specifying how waste should be collected, stored, and transported. All disposal is done in accordance with the Tennessee Department of Health and the Environment (TDEC).

BGE is responsible for properly storing and separating hazardous waste within the Department until it is picked up by OSRM (via contractor). Within each laboratory, containers collecting hazardous waste will be properly labeled and stored.

To dispose of hazardous waste, the laboratory supervisor notifies the Dept CHO which containers should be disposed. The Dept CHO places the labeled container in 108 Holt (Hazardous Waste Room) in the appropriate storage cabinet. Once hazardous waste is placed in 108 Holt, the weekly log needs to be maintained until pick-up.

Hazardous waste cannot be stored in 108 Holt longer than 180 days. The Dept CHO will notify OSRM (via a hazardous waste pick-up form) there is hazardous waste ready for pick-up at 120 days to allow time for scheduling. The OSRM will coordinate with the Dept CHO to schedule the hazardous waste pick-up.

IX. RECORD KEEPING

Records of environmental monitoring and examinations (including tests and written opinions) for each employee are required.

- Accident investigations: Records written and retained by OSRM.
- Chemical inventory: Each laboratory supervisor is responsible for keeping an accurate inventory of chemicals in his/her laboratory. This inventory will be added to the Department master inventory, maintained by the Dept CHO. A duplicate copy is sent to the OSRM annually.
- Environmental monitoring: Records written and maintained by the Dept CHO and OSRM.
- Training records: Maintained by the Dept CHO and an annual report is provided to the UTC Chief CHO.

In BGE, the Faculty Associate shall serve as the designated Dept CHO and the Custodian of Record. All records are kept, transferred, and made available in accordance with 29 CFR 1910.20.

X. TRAINING

A. Training Requirements

Training is a necessary and important part of the Chemical Hygiene Plan. The OSRM provides training for hazardous materials in the workplace. All laboratory supervisors, employees and students are trained at the time of their initial assignment to work in an area where hazardous chemicals are present. Additional training is required if new assignments involve exposure to different risks. All training is documented in writing by attendance records.

B. CHP Training

All laboratory employees and students must receive documented CHP training prior to any work with hazardous materials. The Laboratory Supervisor is responsible for providing CHP training. CHP training should include the following:

1. **Review the lab-specific CHP in its entirety.**
2. **Review of the lab-specific safety controls.**
3. **Review lab-specific SOPs.**
4. **Review any other lab-specific protocols or requirements.**
5. **Covered Topics Should Include:**
 - Content and location of the CHP
 - Location of the SDS and its component parts
 - Location of emergency contact information
 - Identification of chemical hazards
 - Location of a chemical
 - Proper labeling of a chemical
 - Procedures for handling hazardous chemicals
 - Permissible exposure limits (PEL) for specific chemicals used in the laboratory.
 - Work practices
 - Proper moving, storage, and use of hazardous materials
 - Visual appearance of chemicals used.
 - Signs and symptoms of exposure
 - Protective equipment used to prevent overexposure.
 - Conditions to avoid.
 - Emergency procedures
 - Spill containment
 - Medical consultation procedures
6. **Upon completion of the Chemical Hygiene Training Program the lab employee/student should be able to:**
 - Locate the potentially hazardous chemicals in the workplace.
 - Recognize the chemical labeling and its meaning.
 - Locate the SDS in the workplace.

- Locate the hazard identification, first-aid measures, handling & storage, exposure controls/personal protection, and disposal consideration sections of the relevant SDS.
- Identify the person responsible for the CHP by name and title.
- Discuss the major components of the facility's standard labeling system.
- Identify the appropriate safety controls for the area and demonstrate its proper use.
- Demonstrate emergency procedures in the event of a hazardous chemical spill.

XI. CHEMICALS REQUIRING APPROVAL FOR USE

There are several hazardous chemicals that require an evaluation of proposed protective procedures before any activity involving the handling of the chemical is commenced. If you plan to work with any of the chemicals on the list below, you must contact the Dept CHO. The Dept CHO will then submit a recommendation for approval or rejection to the Department Head, who makes the final decision. Approval must be obtained in advance before purchase or usage of any chemical listed below. It is the responsibility of the Dept CHO to determine through inventory which chemicals are placed on the Acutely Hazardous Chemicals List.

The person responsible for the CHP should review the chemical inventory listing and designate the acutely hazardous materials present. The listing should be reviewed and updated as necessary. Examples for each category of acutely hazardous chemicals are listed below and should not be considered a complete list.

A. Toxic Gas

- Arsenic
- Carbon Monoxide
- Fluorine
- Hydrogen Cyanide
- Hydrogen Selenite
- Phosphine

B. Acutely Toxic Compounds

- Cyanide Compounds
- Dioxan
- Pesticides
- Plutonium
- Ricin

C. Shock Sensitive Compounds

- Acetyl Peroxide
- Benzoyl Peroxide
- Nitroglycerine (and other nitro- compounds)
- Picramide
- Picric acid

D. Highly Corrosive Compounds

- Benzenesulfonic Acid
- Benzotrichloride
- Hydrofluoric Acid
- Methanoic Acid\ Ethanoic Chloride

E. Extremely Flammable Compounds

- Arsenic
- Carbonyl Sulphide
- Dipropylamine

XII. MEDICAL CONSULTATIONS AND EXAMINATIONS

All employees needing medical attention must use the University Worker's Compensation procedures defined by the UTC Human Resources.

Non-University employees and students shall bear the expense for medical surveillance and treatment in the event of an accidental exposure to a hazardous chemical. These individuals may contact the OSRM to request information about filing appropriate claims for compensation pursuant to the guidelines set forth by the Tennessee Claims Commission.

XIII. RADIATION SAFETY

The purpose of this section of the CHP is to present regulations and recommended procedures for work with radiation sources at UTC to protect the individual, prevent the spread of contamination and to assist in fulfilling the responsibilities of the University to its students, its staff, and its neighbors.

Radiation is an invaluable tool in teaching and research and, when properly used, can provide great benefits to mankind with little or no attendant risk. However, improper use can bring risk of radiation exposure resulting in chronic illness, injury, or even death. The known hazards in the order of their importance, are the deposition of radioactive materials in the body, external exposure to neutrons, to gamma and x-rays, and to beta radiation.

Use of radiation sources implies acceptance by the user of some increased exposure above the natural background radiation to which everyone has always been exposed. Common sense dictates that such increase in personnel exposures and contamination levels should be kept to a minimum consistent with reasonable effort and expense. Minimums considerably lower than the so-called "Maximum Permissible Levels" can be maintained provided the user has adequate knowledge, adequate equipment, and the skill and disposition to use them. Proper disposition means a balanced perspective towards radiation entailing a healthy respect, free of both the blind fear of the novice and the familiar contempt one sometimes encounters in the "old hand."

This section is designed to help University staff in performing teaching and research with radiation sources in a safe, legal, and efficient manner without imposing unnecessary restrictions on anyone's work. Some of the rules come from Federal and State Regulations which, having the force of law, permit no modifications unless specifically permitted by law.

In general, it is the responsibility of the individual radiation user to understand and conduct their operations in an acceptable manner to minimize hazards to themselves and others. It is the responsibility of the laboratory supervisor to ensure that all personnel, particularly new personnel, in their area are properly instructed with respect to the nature of the radiation hazards and the necessary radiation safety procedures in their laboratory and that they possess the necessary skills and disposition to cope with radiation safety problems safely. The Radiation Safety staff is responsible for assisting all users and supervisors by providing consultation and certain services in matters of radiation safety.

The Radiation Safety Committee is responsible for establishing policies for the Radiation Safety Program, for reviewing the work of the Radiation Safety staff, and advising both them and the radiation users on particular problems.

A. Radiation Laboratory Procedures

- The use of radioisotopes is restricted to approved areas.
- Before using any radioisotope in the laboratory, you must be familiar with limitations placed on this institution regarding isotope use.
- To prevent accidental entry of radioactive materials into the body, high standards of cleanliness and good housekeeping must be maintained in all laboratories where radioactive material is present.
- Always use gloves. Remove gloves before leaving the work area. Wear protective clothing (lab coats, masks, shoe covers) as needed.
- Wash hands and arms thoroughly before handling any object which goes to the mouth, nose, or eyes (e.g., cosmetics, foods). Keep fingernails short and clean.

- Smoking and eating in radioisotope laboratories is prohibited. No food or drink may be stored in laboratory refrigerators.
- One or more trial runs with non-radioactive materials are recommended for new procedures and new personnel to test effectiveness of procedures and equipment.
- Use double containers for storage of working solutions of radioisotopes. For example, if the radioisotope solution is in a liquid scintillation vial, place the vial in a small beaker.
- Never pipette by mouth. Use rubber bulbs, syringes, or mechanical devices.
- Clean up minor spills immediately. For major spills, follow emergency procedures.
- Whenever possible, operations with radioactive materials should be conducted in a hood, dry box, or some other type of closed system. Operations with materials susceptible to atmospheric distribution, such as boiling, evaporating, distilling or ashing, must be done in a fume hood with an air flow of approximately 100 linear feet per minute. Work with activities of more than a few hours half-life should be done over a tray. Work with finely divided powder must be done in a fume hood or closed system.
- Table and bench tops should be made of non-porous, chemical resistant material. Working surfaces shall be covered with absorbent paper regardless of the type of surface.
- When work is completed, each person will clean up their own work area and arrange for disposal or proper storage of all radioactive materials and equipment.
- Vacuum pumps used in systems containing radioisotopes must not be permitted to exhaust into the room air or out windows. Use a double trap mechanism on any vacuum system.
- Exhaust stacks must not be vented near windows that can open or building air intake vents.
- Laboratories shall provide special radioactive waste containers. These shall bear the words "Caution, Radioactive Waste".
- Laboratory personnel are responsible for all housekeeping within the laboratory.
- Repairs such as plumbing, etc., should not be undertaken unless Radiation Safety has been notified.
- When use and storage of radioactive materials will be terminated at a facility, notify the Radiation Safety Officer, who must make a terminal survey before an area can be released for other uses.

B. Radioactive Waste Management

Researchers must ensure, prior to the procurement of any radioactive materials, that a method of disposal of the materials either presently exists or can be worked out to the satisfaction of the Radiation Safety Officer.

- Each Radioisotope Laboratory Supervisor must maintain accurate records of the types, quantities, and forms of radioisotopes placed in the radioactive waste which is released from their radioisotope laboratory. Records kept by the Laboratory Supervisor may be based on either calculations or on measurements.
- Radioactive waste containers should be stored as close to the work area as possible to minimize the probability of spillage during the transfer of waste to the containers.
- Waste containers shall not be stored in hallways, stairwells, or other uncontrolled areas.
- Radioactive waste containers should be always covered when not in use.
- Each radioactive waste container shall be labeled with a "Caution Radioactive Materials" label or sticker.
- When handling or transferring radioactive waste, the individual should wear a laboratory coat and disposable gloves.
- Radioactive wastes containing carcinogens, biohazards, or very hazardous chemicals must be inactivated, if possible, and packaged in such a way that they present minimal hazards to people who handle the wastes.

C. Radiation Emergency Procedures

In all emergencies, the UTC Radiation Safety Officer and UTC CHO should be contacted as soon as possible.

1. Extreme Hazards.

Defined as high radiation levels or the possibility of airborne contamination from dry or volatile radioactive materials.

- Evacuate the laboratory immediately. Close and lock the door.
- Summon the UTC CHO and the Radiation Safety Officer (RSO) immediately.
- Remove shoes if contamination is suspected. Do not touch anything unnecessarily.

2. Other Hazards.

Examples: spills or suspected spills of radioactive materials where the material is not airborne.

Keep calm. Assume that you are contaminated until a survey proves otherwise

- Confine contamination.
 - o Localize the spill. Right a tipped container, then drop absorbent material on the spill.
 - Do not try to clean up entirely
 - o Damp down a dry spill.
 - o Do not track contamination around the laboratory. Call for help if possible.
 - o Close the door to prevent the spread of airborne contamination.
 - o Check shoes before leaving the area after a spill has been cleaned up.
- Protect personnel.
 - o Remove contaminated clothing and wash contaminated parts of the body with detergent.
 - o Warn other workers.
- Decontaminate.
 - o If thorough washing does not remove contamination from the body, consult the UTC CHO.
 - o Do not spread radioisotopes to clean areas.

XIV. GLOSSARY

The following terms are used as part of the Chemical Hygiene Plan:

Acute: An adverse effect with symptoms of high severity coming quickly to a crisis.

Carcinogen: A substance capable of causing cancer.

Chemical Hygiene Officer (CHO): The person responsible for the chemical hygiene program and the content in the chemical hygiene plan.

Chemical Hygiene Plan (CHP): "A written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment, and work practices that are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workspace." 29 CFR 1910.1450.

Combustible: Able to catch on fire and burn.

DOT: Department of Transportation

EPA: Environmental Protection Agency

Flammable: Capable of being easily ignited and burning with extreme rapidity.

Infectious: Sources that cause infections either by inhalation, ingestion, or direct agents contact with the host material.

OSHA: Occupational Safety and Health Administration, the regulatory branch of the Department of Labor concerned with employee safety and health.

PEL: Permissible Exposure Limit: The legally allowed concentration in the workplace that is considered a safe level of exposure for an 8-hour shift, 40 hours per week.

PPE: Personal protective equipment: Clothing and other equipment worn by the personnel used to minimize the risk of coming into bodily contact with a hazardous material.

SDS: Safety Data Sheet

XV. REFERENCES

THE FOLLOWING SOURCES WERE USED TO PREPARE THIS PLAN:

1. U.S. Department of Labor, final rule part II. Federal Register 29 CFR Part 1910. Occupational Exposure to Hazardous Chemicals in Laboratories, Wednesday, January 31, 1990.
2. National Research Council. Prudent Practices for Handling Hazardous Chemicals in Laboratories, National Academy Press, 1981.
3. National Research Council. Prudent Practices for Handling Hazardous Chemicals in Laboratories, National Academy Press, 1983.
4. A Model Chemical Hygiene Plan for Laboratories, Terry Jo Gile, MT(ASCP), MA Ed. Clinical Laboratory Management Association, Inc. 1990.
5. Purdue University Chemical Hygiene Plan and Hazardous Materials Safety Manual. July 2014.

XVI. BIOSAFETY

Below is information regarding use with biohazardous materials and biologicals. Note: UTC facilities cannot currently support activities requiring BSL-3 or higher containment.

Further information will be provided here. Resources for information include the UTC IBC <https://www.utc.edu/research/research-integrity/institutional-biosafety-committee-ibc>

And the UTK biosafety program.

<https://biosafety.utk.edu>

A. Biosafety Levels

BSL-1: Not known to consistently cause disease in healthy adult humans, and of minimal potential hazard to laboratory personnel and the environment. Examples: *Saccharomyces cerevisiae*, *E. coli* K-12, and non-infectious bacteria.

BSL-2: Moderate potential hazard to personnel and the environment. Includes bacteria and viruses that cause mild disease to humans or are difficult to contract via aerosol in the lab setting. Examples: Hepatitis A virus, *Streptococcus pyogenes*, *Borrelia burgdorferi* (Lyme disease), *Salmonella* species.

BSL-3: Microbes that are either indigenous or exotic, and they can cause serious or potentially lethal disease through respiratory transmission. Examples: *Yersinia pestis* (plague), *Mycobacterium tuberculosis*, SARS, rabies virus, West Nile Virus, hantaviruses.

BSL-4: Dangerous and exotic, posing a high risk of aerosol-transmitted infections. Infections caused by these microbes are frequently fatal and without treatment or vaccines. Examples: *Ebola* virus, smallpox virus.

B. Biosafety Practices

Basic Elements of standard microbiological practices at BSL-1:

- Restricting access to laboratories using biological hazards to appropriate personnel.
- Wash hands after handling biologicals and potentially hazardous materials, after taking off gloves and before leaving the lab.
- Avoid hand-to-face (or mouth) contact. No eating, drinking, smoking or applying cosmetics in the labs.
- Disinfect work surfaces daily and decontaminate after spills.
- Handle, manage and dispose of sharps appropriately.
- Use procedures that minimize the formation of aerosols and splashes; engineering controls for aerosol release may be required.
- Wear appropriate PPE.
- Use primary and secondary containment when transporting materials.
- Dispose of non-sharps solid biological waste in proper container (see below). Liquid biological waste must be disinfected or autoclaved before sink disposal.

Biosafety Level 2 practices consist of BSL-1 PLUS:

- Hazard communication through door signs/placards and biohazard labelling
- More stringent PPE requirements.
- Aerosol control and containment.
- Enhanced engineering controls via biosafety cabinets and emergency eyewashes.

XVII. BIOHAZARD WASTE

Solid Biohazard Waste:

Solid biohazard waste will be placed in a red biohazard bag. Tie off the bag to make sure it is closed and place in a biohazard cardboard box.

- Biohazard bags and boxes are found in 108 Holt (Hazardous Waste Room).
- Maximum weight per box = 40lb.
- Use packing tape to seal the biohazard box, both top and bottom.
- Do not close the biohazard boxes using an 'over/under' technique.
- On the box, write your name and the contents.

When the biohazard box is ready for pick-up, take the box to 108 Holt. There is a designated location for the biohazard boxes.

Notify the Dept CHO there are boxes in 108 Holt ready for pick-up.

If new biohazard bags and boxes are needed in 108 Holt, please notify Dept CHO.

Prior to placement in 108 Holt, biohazard waste should be contained within each faculty's research space or teaching lab in which it was generated. DO NOT place biohazard waste in the hallways.

Biohazard Waste for Non-Preserved Specimens: If biohazard waste is not preserved, it will biodegrade and start smelling very quickly, which makes for unsafe working conditions.

- If you have biohazard waste that is not preserved (or has not been sterilized prior to pick-up), keep specimens in the refrigerator/freezer.
- Inquire with Dept CHO when the next biohazard waste pick-up is scheduled for BGE.
- When the Dept CHO lets you know when the pick-up is scheduled, box the biohazard waste according to the guidelines above and place in 108 Holt within 24 hours of the scheduled pick-up (Ideally 12 hours).
- This will help ensure that the biohazard waste does not biodegrade and smell for prolonged periods of time.

108 Holt is card swipe access for BGE Faculty and Staff only. Students are not allowed card swipe access to this room.

Liquid Biohazard Waste:

- Liquid biological waste must be disinfected (e.g., using Decon disinfectant, bleach or 70% ethanol overnight) or autoclaved before sink disposal.