UNDERGRADUATE CURRICULUM PROPOSAL COVER SHEET

Title of Proposal – Must begin with Department Abbreviation:
BIOL- Conversion of a Biol4399 class to a regular Biology class (BIOL***) offering

Check One: ☑ Full Proposal or □ Information Item

Effective Date for Curricular Offering: Fall 2009

FROM: Ethan A. Carver, Biological and Environmental Sciences, Holt Hall 227, 425-4315, ethan-carver@utc.edu (proposal originator: include spokesperson’s name, department, office number, telephone, e-mail)

Does this require new resources from the originating department or other department? NO

Please attach explanation if yes.

Faculty of the originating department approved this proposal on 11/7/08 (date),
by a vote of 16 aye votes; 0 nay votes; 0 abstentions: 0 eligible voting members absent

The following have examined this proposal:

Dept Head/Director: John C. Irwin
signature
approve neutral disapprove*

College Curriculum Committee Date: ______ Vote: ______ Signature of Chair: __________

Spokespersons for Affected Departments:

(signature, department, date) approve neutral disapprove*

(signature, department, date) approve neutral disapprove*

(signature, department, date) approve neutral disapprove*

(signature, department, date) approve neutral disapprove*

Dean/Director: H. Burhenn
signature approve neutral disapprove*

University Registrar: Linda Orth
signature approve neutral disapprove*

Provost: Phil Oldham
(signature, department) approve neutral disapprove*

*Those who disapprove may attach an explanation

<table>
<thead>
<tr>
<th>ACTIONS on this proposal:</th>
<th>Curriculum Committee</th>
<th>Faculty Senate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date the proposal was considered</td>
<td>______</td>
<td>______</td>
</tr>
<tr>
<td>Vote of the body:</td>
<td>______</td>
<td>______</td>
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<tr>
<td>Accepted as information item (indicate date)</td>
<td>______</td>
<td>______</td>
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<tr>
<td>Approved as submitted (indicate date)</td>
<td>______</td>
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</tr>
<tr>
<td>Approved with amendments (amendments indicated and transmitted to all signatories above, date):</td>
<td>______</td>
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<tr>
<td>Signature of Chair:</td>
<td>______</td>
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Revised 2/16/2007
BIOL 434
Human Development and Disease

Rationale:

This proposal requests the introduction of a new class in the Biology curriculum. Our department has seen a large increase in student enrollment in our program, and it has become increasingly difficult for students to enroll in upper-level biology courses. Human Development and Disease will provide our majors, and Pre-Professional majors (200+students) in particular, with another Zoology course that is human-centric and very applicable to future health care providers.

Historically, Pre-Professional majors have only been able to choose from three different classes to fulfill the Zoology requirements for this concentration. This included; Comparative Zoology (Biol313), Histology (Biol330), and Vertebrate Developmental Embryology(Biol403). These classes were not offered often enough, or were not large enough to meet the increased enrollment of Pre-Professional majors in our department. Three years ago, we added an option for the students to take Human Anatomy (Biol191), and one additional Zoology class, instead of the original three classes. This extra option requires the student to take additional classes, and has also been problematic.

The department recently filled a Human Anatomy and Physiology lecturer position specifically to shift teaching responsibilities within the department and allow more advanced Biology courses to be taught more often, and for new courses to be introduced to the curriculum. The lecturer will teach Human Anatomy every other semester, and will position me to teach an additional course every other fall semester.

The existing Vertebrate Developmental Embryology class (Biol403) is a basic research science class that does not directly address human developmental concerns. This new course focuses on human development and associated disease states in a very clinical manner. It discusses human development, professional ethics, new developments from clinical trials, and helps students relate science with their future careers.

Human Development and Disease was taught in the Fall 2007 semester, and the enclosed syllabi are from that class. The student reviews of the class were very favorable, and a copy of them will be made available upon request.

Course Description:

The four credit hour course centers on the study of genetic, physiological, environmental and interactive variables that influence human development from gametogenesis to birth. The student will acquire an understanding of how development occurs in humans and the relationship between abnormal developmental processes and human disease states. Laboratory explores human development through the use of embryological slides, models, and applied techniques.
Grading format: Standard grading format :A-F shown in syllabus.

Course instructor: Dr. Ethan Carver

Course Objectives:
1. Describe the major milestones and anatomical structures associated with human development.
2. Explain the major theories and issues associated with human heredity and prenatal development and subsequent disease states.
3. Understand research methods used to study development and their applications.

Course Details:
(Must take both lab and lecture concurrently, details provided in syllabi.)

Impact:

Pedagogical consequences: We have revised our teaching schedules with the addition of a lecturer position. The lecturer position will teach a Human Anatomy course during alternating Fall semesters, and allow Dr. Carver to teach an additional upper-level biology course, and help facilitate student completion of degree requirements.

Economic impact: The economic impact of this course should be minimal to the department. Laboratory models have been purchased with a UC Foundation Instructional Excellence Award (#R04-1011-082). The use of laboratory fees will offset the costs of recurring laboratory materials.

External impact: No major impact on requirements and resources in other departments or programs is expected.
Catalog additions

Course Description (New):

434 Human Development and Disease (4)
This four credit hour course centers on the study of genetic, physiological, environmental and interactive variables that influence human development from gametogenesis to birth. The student will acquire an understanding of how development occurs in humans and the relationship between abnormal developmental processes and human disease states. Laboratory explores human development through the use of embryological slides, models, and applied techniques. Lecture 3 hours, laboratory 2 hours.
Prerequisite: Biology 325 with a minimum grade of C; Biology 313 recommended.
Pre-or corequisite: Chemistry 352/354. Laboratory/studio course fee will be assessed.

Current catalog (p79) See next page.
Biology (B.S.)

General Education (see pages 65-68 for list of approved courses)

Rhetoric and Composition: Two approved courses in rhetoric and composition (6 hours)

Mathematics: One approved mathematics course (3 hours)

Statistics: Biology 216* (4 hours) or Mathematics 210 (3 hours) Students who have taken Engineering 222, HHP 401, Mathematics 307, 408, Psychology 201 or Sociology 250 and subsequently changed their major to Biology will have satisfied this requirement.

Natural Sciences: Two approved natural science courses, at least one including a laboratory component (7-8 hours)

Humanities and Fine Arts: Two approved humanities and fine arts courses, one from fine arts and one from either (6 hours)

Cultures and Civilizations: Option A: Western Humanities I and II and one approved Non-Western Cultures and Civilizations OR Option B: World Civilization I, II, III (9 hours total)

Behavioral and Social Sciences: Two approved behavioral or social science courses in two different disciplines (6 hours)

Major and Related Courses

English 278 (required within the first 60 hours) or Biology 495. Students who have taken English 276, 277 or 279 and subsequently changed their major to Biology will have satisfied this requirement.

Foreign Language through the first year college in one foreign language or the equivalent through placement exam. Students with documented evidence that English is their second language as determined by the department head will meet the foreign language requirement after successful completion of English 122.

Mathematics 131 and 136, OR 144, 145 and 151/152 (Initial course in Mathematics sequence is dependent upon UTC Math Placement.)

Chemistry 121/122, 124/125, 351/353, 352/354.

Biology - 38 hours including 121, 122 (a grade of C or better must be earned in 122 in order to take courses beyond the 100 level for which 122 is a prerequisite), 325 (326 required for the molecular concentration but is an elective for all other concentrations), four laboratory courses above the 100 level, 3 hours of a single, formal lecture or laboratory course at the 400 level.

No more than 4 hours of 497r and/or 498r may be counted as part of the 38 hours of biology. All senior level students must take a major field achievement test in biology prior to graduation.

2.0 average in all biology courses.

Minimum of 39 hours of 300 and 400 level courses.

Electives to complete 120 hours.

See page 63 for additional requirements.

*A also satisfies requirement in the major.

Each biology major must also complete the requirements for one of the following concentrations.

2126 - General Biology

Physics 103/183, 104/184 or Geology 111/181, 112/182 (Physics 103/183, 104/184 recommended for prospective graduate students)

Biology courses:

Botany (select 1 course) - 207, 351, 352

Zoology (select 1 course) - 312, 313, 320, 330, 340, 342, 403, 408, 456, 457, 458 (Courses offered in Botany and Zoology at Gulf Coast Research Laboratory or Highlands Biological Station may be substituted. Approval of the department head required.)

Ecology and Evolution (select 1 course) - 306/307, 315, 406, 416, 440, 450

Cell and Physiology (select 1 course) - 304, 311, 323, 401, 404, 412, 420, 428, 460, 463

Recommended electives: Chemistry 341, 466

2127 - Preprofessional (Premedical, Predental, Premedical Technology)

Chemistry 466, Physics 103/183 and Physics 104/184

Biology courses:

Botany (select 1 course) - 207, 351, 352.
Catalog changes: (All changes in bold and underlined, and are just the addition of the class to the proper Zoology group)

2126 - General Biology
Physics 103/183, 104/184 or Geology 111/181, 112/182 (Physics 103/183, 104/184 recommended for prospective graduate students)
Biology courses:
Botany (select 1 course) - 207, 351, 352
Zoology (select 1 course) - 312, 313, 320, 330, 340, 342, 403, 408, 456, 457, 458, 434
(Courses offered in Botany and Zoology at Gulf Coast Research Laboratory may be substituted. Approval of the department head required)
Ecology and Evolution (select 1 course) - 306/307, 315, 406, 416, 440, 450
Cell and Physiology (select 1 course) - 304, 311, 323, 412, 420, 428, 460, 463
Recommended electives: Chemistry 341, 466

2127 - Preprofessional (Premedical, Predental)
Chemistry 466, Physics 103/183 and Physics 104/184
Biology courses:
Botany (select 1 course) - 207, 351, 352.
Zoology (select 1 option) - 313, or 403, or 434; or 191 plus one course to be chosen from 312, 320, 340, 342, 408, 456, 457, 458
Ecology and Evolution (select 1 course) - 306, 315, 416, 450
Cell and Physiology (select 2 courses) - 311, 323, 428, 460
One additional course to be chosen from
Zoology - 312, 313, 320, 330, 340, 342, 403, 408, 456, 457, 458, 434
OR
Cell and Physiology - 304, 311, 323, 412, 420, 428, 460, 463
Recommended elective - Classics 300

2130 - Molecular
Mathematics 144, 145 and 151/152 recommended for prospective graduate students.
Chemistry 466, Physics 103/183 and Physics 104/184
Biology courses:
Botany (select 1 course) - 207, 351, 352
Zoology (select 1 course) - 312, 313, 320, 330, 340, 342, 403, 408, 456, 457, 458, 434
Ecology and Evolution (select 1 course) - 306, 315, 406, 416, 450
Cell and Physiology - 311, 326, 412, 420, 428
Recommended elective: Chemistry 341
Human Development and Disease

Fall Semester 2007
Biology 499
HOLT207
M/W/F 10-10:50 am
Dr. Ethan Carver

Office Hours: M/W/F 9-10 am  T-TH 10-11am
Office: Holt 227
Office Phone: 423-425-4315, Department phone: 423-435-4341
Email: Ethan-Carver@utc.edu

Lecture Text: Human Embryology and Developmental Biology (B.Carlson-3rd ed.)

Syllabus is tentative and dates/topics are subject to change.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Text Chapter</th>
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<tbody>
<tr>
<td>August 20</td>
<td>Introduction/Orientation</td>
<td>*</td>
</tr>
<tr>
<td>August 22</td>
<td>Gametogenesis</td>
<td>1p1-13</td>
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<td>August 24</td>
<td>Gametogenesis</td>
<td>1p14-25</td>
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<td>August 27</td>
<td>Fertilization</td>
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<td>August 29</td>
<td>Cleavage</td>
<td>3p43-53</td>
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<td>August 31</td>
<td>Implantation</td>
<td>3p53-63</td>
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<td>September 3</td>
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<tr>
<td>September 5</td>
<td>Molecular Development I</td>
<td>4p65-72</td>
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<tr>
<td>September 7</td>
<td>Molecular Development II</td>
<td>4p72-81</td>
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<tr>
<td>September 10</td>
<td>Formation of Germ Layers I</td>
<td>5p83-91</td>
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<tr>
<td>September 12</td>
<td>Formation of Germ Layers II</td>
<td>5p91-101</td>
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<tr>
<td>September 14</td>
<td>EXAMINATION I -100 Points</td>
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<tr>
<td>September 17</td>
<td>Basic Body Plan I</td>
<td>6p103-114</td>
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<tr>
<td>September 19</td>
<td>Basic Body Plan II</td>
<td>6p114-127</td>
</tr>
<tr>
<td>September 21</td>
<td>Placenta/Extra-embryonic Membranes I</td>
<td>7p129-140</td>
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<td>September 24</td>
<td>Placenta/Extra-embryonic Membranes II</td>
<td>7p140-149</td>
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<td>September 26</td>
<td>Developmental Disorders I</td>
<td>8p151-158</td>
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<td>September 28</td>
<td>Developmental Disorders I</td>
<td>8p159-169</td>
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<td>October 1</td>
<td>Integumentary System</td>
<td>9p173-182</td>
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<td>October 3</td>
<td>Skeletal System</td>
<td>9p182-193</td>
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<tr>
<td>October 5</td>
<td>Muscular System</td>
<td>9p193-208</td>
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<td>October 8</td>
<td>EXAMINATION II -100 Points</td>
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<tr>
<td>October 10</td>
<td>Limb Formation I</td>
<td>10p209-214</td>
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<tr>
<td>October 12</td>
<td>Limb Formation I</td>
<td>10p215-231</td>
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<td>October 15</td>
<td>Nervous System I</td>
<td>11p233-245</td>
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<td>October 17</td>
<td>Nervous System II</td>
<td>11p245-264</td>
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<td>October 19</td>
<td>Nervous System III</td>
<td>11p264-275</td>
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<tr>
<td>October 22</td>
<td>No Classes (Fall Break)</td>
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</table>
October 24   Neural Crest     12
October 26   Sense Organ-Eye    13p291-306
October 29   Sense Organ-Ear    13p306-315
October 31   Head and Neck     14p317-334
November 2   Head and Neck     14p334-351

**November 5**  EXAMINATION III -100 Points
November 7   Digestive System    15p353-370
November 9   Glands            15p370-374
November 12  Respiratory System  15p374-391
November 14  Urinary System    16p393-401
November 16  Reproductive Systems  16p401-427
November 19  Hematopoiesis/Vessel Formation  17p429-446
November 21  Heart Development  17p446-478
November 23  No Classes (Thanksgiving Break)
November 26  Fetal Development   18p477-491
November 28  Birth            18p492-498

**December 3**  EXAMINATION IV -100 Points
December 5 (8-10am)  COMPREHENSIVE FINAL  -100 Points

**Class information:** It is essential to develop a good working vocabulary as you progress throughout the semester. You should be able to define the structures/terminology as you move through each section of material. It is important that you learn the major functions of all the anatomical structures that you are studying throughout the course.

Attending class is an important requirement that will enhance your ability to understand the material. Be on time for class. At the very least, prior to each lecture, read the chapter appropriate for the lecture topic*. Take notes during the lecture. Read the chapter carefully and make certain that you write definitions for all major terms. The text should be used as a supplement to the lecture material, and not as substitute for attending class.

**Quizzes:** There are 11 unannounced quizzes during the semester. These quizzes will be given over the assigned reading from the textbook for that specific date. It is not a quiz over previously discussed material. *It is over the material you should read prior to class.* The quizzes are worth 10 points each. You will be able to drop the lowest quiz grade. There are NO make-up quizzes, if you miss a quiz for any reason, you receive a zero on the quiz.

**Examinations:** The exams will be multiple-choice, definitions, short answer and essay. If you are having trouble with certain areas, please do not wait until right before an exam to seek clarification. It is better to ask these questions early, and avoid prolonged confusion.

**Make-ups:** Please note there will be NO make-up examinations. If you are ill or an emergency arises, it is your responsibility to notify me prior to exam time as soon as
possible. If you miss an exam and provide an excuse acceptable to me (“Dr’s excuse, etc.), your grade will be prorated based on the remaining exams. If you miss a second exam for **ANY** reason, you will receive a **zero** for that exam.

**Grading:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Points</th>
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<tbody>
<tr>
<td>4 Lecture Tests (100 points each)</td>
<td>400</td>
</tr>
<tr>
<td>Comprehensive Final</td>
<td>100</td>
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<tr>
<td>Laboratory Total</td>
<td>300</td>
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<tr>
<td>Quiz Total</td>
<td>100</td>
</tr>
<tr>
<td><strong>Course Total</strong></td>
<td><strong>900</strong></td>
</tr>
</tbody>
</table>

This is a 4-hour course that includes a required laboratory component. There is no partitioning of credits between lecture and lab.

The course grade will be calculated as follows:

\[
\frac{\text{Total lecture exam points} + \text{total laboratory points} \times 100}{\text{Total possible points (900)}} = \%
\]

**Grade Scale:**

- 90- 100% = A
- 80- 89% = B
- 70- 79% = C
- 60- 69% = D
- Below 60% = F

There is **no** curve for the class. (If you make 89.99%, it is a B, etc…) There is **no** extra-credit for the class.

**School Closure:** On exam day, if school is closed due to unforeseen circumstances, (weather), the exam will be given during the next scheduled class.

**Courtesy:** The use of electronic devices, such as cell phones or MP3 players, is not allowed during class. Please turn off cell phones before the start of class.

**Electronic Device policy:** Cell phones, MP3 players, iPODs, etc..., should not even be present during an exam. If you have an electronic device out or in-use during an exam, your exam will be taken, and you will receive a **zero** on the exam, and potentially other disciplinary measures.

**University Policies and Procedures:** Please refer to the Student Handbook for policies on topics such as the honor system.
Special Services: If you find that personal problems, career indecision, study and time management difficulties, etc. are adversely affecting your successful progress at UTC, please contact the Counseling and Career Planning Center at 425-4438. If you are a student with a disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) and think you might need special assistance or a special accommodation in this class or any other class, please speak with your professor as soon as possible. You may also contact the UTC Office for Students with Disabilities at 425-4006 or go by their office in 110 Frist Hall on the UTC campus.
Human Development and Disease Laboratory
Fall Semester 2007
Biology 499
HOLT228
W -- 1-2:50 am
Dr. Ethan Carver

Office Hours: M/W/F 9-10 am  T-TH 10-11am
Office: Holt 227
Office Phone: 423-425-4315, Department phone: 423-435-4341
Email: Ethan-Carver@utc.edu

Lab Text: Handouts on BlackBoard

*Syllabus is tentative and dates/topics are subject to change.*

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Handout</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 22</td>
<td>Orientation</td>
<td></td>
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<tr>
<td>August 29</td>
<td>Spermatogenesis</td>
<td>1</td>
</tr>
<tr>
<td>September 5</td>
<td>Oogenesis</td>
<td>2</td>
</tr>
<tr>
<td>September 12</td>
<td>Cleavage/Implantation</td>
<td>3</td>
</tr>
<tr>
<td><strong>September 19</strong></td>
<td><strong>EXAMINATION I -100 Points</strong></td>
<td><strong>T</strong></td>
</tr>
<tr>
<td>September 26</td>
<td>Gastrulation</td>
<td>4</td>
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<tr>
<td>October 3</td>
<td>Neurulation</td>
<td>5</td>
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<tr>
<td>October 10</td>
<td>Organogenesis</td>
<td>6</td>
</tr>
<tr>
<td>October 17</td>
<td>Model building*</td>
<td>7</td>
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<tr>
<td><strong>October 24</strong></td>
<td><strong>EXAMINATION II -100 Points</strong></td>
<td><strong>T</strong></td>
</tr>
<tr>
<td>October 31</td>
<td>Organogenesis/Limb development</td>
<td>8</td>
</tr>
<tr>
<td>November 7</td>
<td>4 month fetus</td>
<td>9</td>
</tr>
<tr>
<td>November 14</td>
<td>Full term and Birth</td>
<td>10</td>
</tr>
<tr>
<td>November 21</td>
<td>Movie</td>
<td></td>
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<tr>
<td><strong>November 28</strong></td>
<td><strong>EXAMINATION III -100 Points</strong></td>
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</table>

**Handouts** will be posted on Blackboard before class. Please bring the handout to class.

**Laboratory Care:** The laboratory is for your use during assigned class periods and during times when classes do not meet. Do not abuse this privilege. Do not put marks on models. Handle all laboratory materials and equipment with care. Return all materials to their appropriate containers or storage areas before leaving the lab. Clean up your area after you have finished your dissection.

Please keep the laboratory doors SHUT at all times.
Do not eat or drink in the laboratory at any time.

There are several lounges in the building for this purpose.
Turn off lights when you are the last person to leave the lab. If you are eating or drinking in the laboratory, 10 points will be deducted from your grade.
Make-ups: There will be no make-up exams. If you are ill or an emergency arises, it is your responsibility to notify your instructor prior to the exam time or as soon as possible. If you miss an exam due to illness or an emergency and can provide a valid excuse, the final lab grade will be the average of the two exams taken. If you are late for a practical exam, you will not get extra time.

This is a 4-hour course that includes a required laboratory component. There is no partitioning of credits between lecture and lab.

The Lab grade will be calculated as follows:

Three laboratory practicals - 300 points (95 points each *-15 pts for model)
Total laboratory points = 300 points

The course grade will be calculated as follows:

\[
\text{Total lecture exam points} + \text{total laboratory points} \times 100 = \% \\
\text{Total possible points (900)}
\]

Grade Scale: 90- 100% = A (810 pts and above)
81- 89% = B (720 pts-809 pts)
71- 79% = C (630 pts-719 pts)
60- 69% = D (540 pts-629 pts)
Below60% = F (539 pts and below)

There is no curve for the class. (If you make 809 pts, it is a B, etc…)
There is no extra-credit for the class.

Special Services: If you find that personal problems, career indecision, study and time management difficulties, etc. are adversely affecting your successful progress at UTC, please contact the Counseling and Career Planning Center at 425-4438. 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, please speak with me as soon as possible. You also need to call the Office for Students with Disabilities/College Access Program at 425-4006 or come by their office - 110 Frist Hall.