Lecture: Tues., Thurs., 10:50 - 12:05 114 Bretske Hall
Lab: Tuesday, 1:40 - 4:20 114 Bretske Hall

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Texts: Compton, R. R., 1985, Geology in the Field. Wiley, 398 p., ISBN 0-471-82902-1

Prerequisites: GEOL 451 Corequisites: GEOL 452 LAB

Description: GEOL 452 is a second-semester course in structural geology. The objective of this class is to make students familiar with methods of field study and interpretation of field relationships, as necessary to geologic mapping and analysis of geologic structures.

This course requires a basic knowledge of structural geology (folds, faults, joints, rock fabric, etc.) and methods of analyzing and solving structural problems (spherical and orthographic projection, 3-point solutions, etc.), as taught in GEOL 451.

## TENTATIVE LECTURE SCHEDULE

| | T | Th | Topic | | Compton | Freeman |
|---|---|---|---|---|---|---|
| Jan | 9 | | Intro., objectives, expectations, equip., etc. | | 1-21 | |
| | | 11 | Computer software and hardware | | | |
| | 16 | | Brunton compass/transit | | 16-21, 34-39 | 2-27 |
| | | 18 | Strike, dip, dip dir., plunge, trend, etc. | | 34,38,382 | 2,3,4,18,19,24,83 |
| | 23 | | Base maps, scales, coord. sys., triangulation | | 99-101,105-106,369 | 68-69,74-77,84-91 |
| | | 25 | From plane table to total station | | | |
| | 30 | | Plane table and alidade | | 135-161 | 36-47 |
| Feb | | 1 | Global Positioning Systems, GPS receivers | | | |
| | 6 | | Outcrop procedures, obs., meas., notes, etc. | | 22-34,40-47 | 62-63 |
| | | 8 | Methods and strategies of geol. mapping | | 75-98 | 72-73 |
| | 13 | | The geologic traverse | | 75-80 | 72-73 |
| | | 15 | Rose diag. & spherical proj. of orient. data | | 40,173-176,383 | 48-61 |
| | 20 | | Spherical statistics and adv. spher. proj. | | | |
| | | **22** | **MIDTERM EXAM** | | | |
| | 27 | | Briefing for project 1, strat sections | 1 | 222-241 | 70-71,92-93 |
| Mar | | 1 | Recitation for project 1, cross sections | 1 | 108-111 | 78-82 |
| | 6 | | Preparation of geologic maps, reports, etc. | **1** | 341-362,372-378 | 94-95 |
| | | 8 | Aerial photos, remote imagery | **1** | 112-134 | |
| | **13** | | **Spring Break, no class** | **1** | | |
| | | **15** | **Spring Break, no class** | **1** | | |
| | 20 | | Remote imagery (cont'd), digital models | **1** | | |
| | | **22** | **Project 1 due**, briefing for project 2 | **1,2** | | |
| | | | **Weekend project (project 2), March 23-25** | 2 | | |
| | 27 | | Field studies of deformed metamorphic rx | 2 | 242-271,319-340 | |
| | | 29 | ...deformed metamorphic rocks (cont'd) | 2 | 242-271,319-340 | |
| Apr | **3** | | **Project 2 due**, briefing for project 3 | 2,3 | | |

## TENTATIVE LECTURE SCHEDULE (CONT'D)

| | T | Th | Topic | | Compton | Freeman |
|---|---|---|---|---|---|---|
| Apr | **3** | | **Project 2 due**, briefing for project 3 | 2,3 | | |
| | | 5 | ...deformed metamorphic rocks (cont'd) | 3 | 242-271,319-340 | |
| | 10 | | Field studies of volcanic rocks | 3 | 272-295 | |
| | | 12 | ... volcanic rocks (cont'd), plutonic rocks | 3 | 272-318 | |
| | 17 | | ... plutonic rocks (cont'd) | 3 | 296-318 | |
| | | **19** | **Project 3 due**, studies of surficial sediments | 3 | 197-221 | |
| | | | | | | |
| | | **26** | **FINAL EXAM (Thurs., April 26, 11:00 am)** | | | |

## TENTATIVE LABORATORY SCHEDULE

| | Tues | | Compton | Freeman |
|---|---|---|---|---|
| Jan | 9 | From Rapidograph and Leroy to Canvas X | | |
| | 16 | Exercise 1: Pace and compass | 75-80, 103-104 | 64-67 |
| | 23 | Exercise 2: Orienteering | 99-101,105-106,369 | 68-69,74-77,84-91 |
| | 30 | Exercise 3: Plane table and alidade | 135-161 | 36-47 |
| Feb | 6 | Exercise 4: Field exercise | 22-34,40-47 | 62-63 |
| | 13 | Exercise 5: Geologic traverse | 75-80 | 72-73 |
| | 20 | Exercise 6: Analysis of structural data | 40,173-176,383 | 48-61 |
| | 27 | Project 1 | 108-111,222-241 | 70-71,78-82,92-93 |
| Mar | 6 | Project 1 (cont'd) | 341-362,372-378 | 94-95 |
| | **13** | **Spring Break, no class** | | |
| | 20 | Project 1 (cont'd) | | |
| | | **Weekend project (project 2), March 23-25** | | |
| | 27 | Project 2 | | |
| Apr | 3 | Project 3 | | |
| | 10 | Project 3 (cont'd) | | |
| | 17 | Project 3 (cont'd) | | |
| | | | | |

## LAB EXERCISES

Most lab exercises will be conducted outdoors and will make use of local areas and outcrops. Alternate (indoor) exercises will be used in cases of very inclement weather.

## FIELD PROJECTS

During the second half of the semester, the class will focus on three field projects. These will require considerable fieldwork. The first 2 projects will utilize local study areas, within 30 minutes of campus, and will require that students plan and conduct some of the fieldwork outside of class time. Tentatively, the third project will entail a field-work-intensive weekend excursion to the Blue Ridge. This trip will require one or two nights camping.

For safety reasons, no one should conduct fieldwork alone. Project groups should consist of 2 or 3 students.

## FIELD PROJECTS (CONT'D)

Collaboration among students is encouraged, particularly during early stages of each project. This may include group efforts in the field and discussions of strategy.

***However, each student is expected to gather and process his/her own data and to independently prepare his/her report.***

Criteria for grading lab exercises and field projects will depend upon the type of report that is required (e.g. site description, geologic map, or written report). Regardless, such criteria are likely to include scientific merit, detail, completeness, adherence to conventions and guidelines, layout (organization), grammar, spelling, general quality of writing, appropriate use of illustrations, drafting, and overall neatness.

## EQUIPMENT

The following equipment and supplies should be available to each student:

- "C-THRU" (or similar) protractor/scale
- sharp, relatively hard pencils (3H is good, 0.5 mm mechanical pencils may be preferred)
- several colored pencils
- field notebook (hard-cover, write-in-the-rain, "surveyors" or "engineers" notebook)
- clipboard
- rock hammer
- hand lens
- miscellaneous drafting equipment

Each student will be assigned a Brunton-type compass/pocket transit, which he/she is responsible for during the semester.

Base maps and a limited supply of drafting/plotting paper will be provided.

Computers with internet connections, peripherals (printer, plotter, scanner), and software are available in the geology computer lab. Computer files related to this class (e.g. base maps, handouts, etc.) will be maintained on these computers and on UTC's online course delivery system (Blackboard).

## GRADES

The final numerical grade for this class will be computed as follows.

| | | | | | | |
|---|---|---|---|---|---|---|
| 18 % | Midterm exam (Feb. 17) | _____ | x | 0.18 | = | _____. |
| 18 % | Average of lab exercises | _____ | x | 0.18 | = | _____. |
| 12 % | Field project #1 | _____ | x | 0.12 | = | _____. |
| 12 % | Field project #2 | _____ | x | 0.12 | = | _____. |
| 12 % | Field project #3 | _____ | x | 0.12 | = | _____. |
| 20 % | Final exam (Thurs., April 26, 11:00 a.m.) | _____ | x | 0.20 | = | _____. |
| 8 % | Misc. assign., quizzes, participation, **attendance** | _____ | x | 0.08 | = | _____. |
| | *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≤59.9, D=60-69.9, C=70-79.9, B=80-89.9, A=90-100

Attendance and participation will be considered in the final grade, as described above.

## EXAMS

Exams will be comprehensive, meaning that each exam will cover all material that precedes it.
The final exam will emphasize the material covered since the midterm exam, but will include questions related to material covered prior to the midterm.

Exams may include questions of fill-in-the-blank, matching, multiple-choice, and short-answer formats, and may require graphic constructions and computations like those made in class, for lab exercises, and on miscellaneous assignments. Students are required to show their work for all constructions and computations on exams.

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.

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 will likely be different from the regular exam.

## OTHER POLICIES

Students are expected to attend class regularly. Attendance and participation will be considered in the final grade. (See *Grades* .)

Students are expected to be punctual, attentive and prepared for class.

Students that arrive late for an exam may not be permitted to take the exam.

Assignments are expected to be turned in on time. 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) may be required.

All students are expected to follow the UTC honor code.

## BLACKBOARD

Some aspects of this course are available through UTC's online course delivery system (Blackboard), which can be accessed at:

http://utconline.utc.edu

Your user name for logging on to the system is your UTCID (mix of letters and numbers). Your password for Blackboard is the same as your password for your UTC e-mail (Onenet) and for your access to the Lupton Library databases. If you change your password in Blackboard, you also change your password on both of these other systems. If you forget your password, follow the "Forgot Password" links from either the Onenet (http://onenet.utc.edu/) or Blackboard (http://bb2.utc.edu/webapps/login) login pages.

Documentation on student use of Blackboard is available at:

http://utconline.utc.edu/BB6Students.html

E-MAIL (firstname-lastname@utc.edu)

To enhance student services, the University will use your UTC email address (firstname-lastname@utc.edu) for communications. (See http://onenet.utc.edu for your exact address.) Please check your UTC email on a regular basis. If you have problems with accessing your email account, contact the Help Desk at 423-425-2676.

ATTENTION: If you are a student with a disability and think that you might need special assistance or special accommodation(s) in this class or any other class, call the Office for Students with Disabilities/College Access Program at 425-4006 or come by the office, 110 Frist Hall.

This syllabus is subject to minor changes.