

**Meetings:** MWF, 10:00-10:50am (lecture/discussion), Science (S) 165  
W, 1:00-3:00pm (lab), S165/S170

**Text:** *Principles of Engineering Geology*, 1988, by Robert B. Johnson & Jerome V. DeGraff,  
published by John Wiley @ Sons.

**Instructor:** Bill Niemann, Ph.D., P.G.

Office: 171 Science Building

Office Hours for GLY 457 Students:

- MWF: 9:00-10:00am,
- M: 2:00-3:00pm
- W: 3:30-4:30pm
- By appointment

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### **Course Description**

Engineering geology is the oldest branch of geology. It can be defined as the application of geologic information to the design of engineered structures. This course will provide basic technical background knowledge for typical engineering geology applications in addition to practice in the art of communication of geologic information for engineering purposes.

### **Relationship of Course to Departmental Goals**

This course addresses the major goals of the geology department at Marshall University: getting students to:

- think logically, critically and creatively,
- communicate ideas clearly and effectively in speaking and writing, and
- recognize, analyze, and solve problems utilizing the most appropriate research methods available.

### **Foundational Knowledge**

Foundational knowledge provides a starting vocabulary and base-level understanding of concepts and phenomena in the study of engineering geology. Foundational knowledge students should already have before beginning this course (prerequisites):

1. Basic understanding of plate tectonics, minerals, rocks, surface processes and earth history. (Successful completion of an introductory geology survey course--GLY 110 or 200 or equivalent--should suffice). If you need to review, consult the instructor for appropriate resources.
2. Basic understanding of topographic maps and ability to recognize properties of and identify basic rocks, minerals and fossils. (Successful completion or current enrollment in, an introductory earth materials lab--GLY 201 or equivalent--should suffice). If you need to review, consult the instructor for appropriate resources.
3. Math skills commensurate with completion of course(s) in college algebra and trigonometry.

4. Writing skills appropriate for college sophomores. For special help, go to <http://www.marshall.edu/cos/studentresources.asp> and click on *Writing Center*.

Foundational knowledge you are not expected to have before beginning this course:

1. Understanding of advanced concepts and terminology from upper-level geology classes in geomorphology, stratigraphy, structural geology and mineralogy/petrology.

### **Course Learning Objectives**

1. Articulate the typical role and duties of an engineering geologist. Demonstrate an appreciation for the type of interaction required with engineers who use geologic information in the design of engineered structures.
2. Demonstrate a familiarity with basic mechanics as they apply to intact rock, rock masses and soils. Be able to solve quantitative problems involving stress and strain of rock and soil and make qualified judgments in the application of this information.
3. Describe how weathering processes influence the engineering behavior of rock and soil including development and/or weakening of discontinuities. Use this knowledge to predict the types of engineering issues that might exist in areas characterized by given geologic materials or history.
4. Demonstrate a familiarity with evaluation of slope stability in both natural and engineered slopes underlain by soil and rock.
5. Describe how subsurface water influences the engineering behavior of rock and soil.
6. Demonstrate how geologic materials are placed in engineered structures as fill, support, ballast, etc.
7. *Application* of all of the above to specific problems, sites, or scenarios through assignments given in this course.

### **Assessment of Learning**

The following measures will be used to assess student attainment of the learning objectives listed above:

- Exams (quantitative problem solving, written answers, fill-in-the blank, lists, etc.),
- Lab exercises and reports,
- Oral presentation,
- Attendance and in-class discussion,
- Homework assignments and/or quizzes (written and problem-based).

These methods are consistent with what students will likely be required to do in the future (grad school, professional life) with knowledge and skills gained from this course.

## **Grading**

### ➤ **Grading scale**

A	=	90-100%	of total points
B	=	80-89%	“ “ “
C	=	70-79%	“ “ “
D	=	60-69%	“ “ “
F	<	60%	“ “ “

### ➤ **Grade components**

Lab exercises/reports .....	30%
Written exams (3) .....	30%
Oral presentation .....	15%
Homework/Quizzes.....	15%
In-class participation.....	10%
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Total.....	100%

## **Academic Dishonesty**

Neither Marshall University nor this instructor tolerates academic dishonesty including cheating, falsification, plagiarism, bribes, favors and complicity. Students who choose to violate MU's policies on academic dishonesty risk dismissal from the University. Pages 105-109 of the 2005-2007 MU Undergraduate Catalog addresses the definitions and procedures specified in cases where academic dishonesty is in question.

## **Policy Statement on Examinations and Assignments including Submittal of Late Work**

- **Major Dates:** The attached schedule includes the dates for the three written examinations and the group project. In all likelihood these dates will not be changed and participation in these activities is required to receive a passing grade in the course. Missed exams may be made up only if the student gives notice and valid reason for his/her absence within 24 hours of the exam.
- **Lab exercises/reports and all homework assignments** are due at the beginning of the class or lab period on the due date. Late submittals will be penalized 10% the first day and an additional 10% per day (weekdays) for subsequent late days, with a maximum penalty of 50%.
- **Credit for in-class activities,** including discussion and quizzes, will not be given for unexcused absences (see attendance policy below). In the case of an excused absence (see attendance policy below), a “no grade” (i.e., no credit or penalty) will be assigned for missed discussion and quizzes any may be made up by a date mutually agreed upon by the student and instructor.

### **Attendance/Class Participation**

In-class discussion/participation is 10% of the course grade and no credit for these activities will be given to students for days they are absent from class without a valid reason. In addition, quizzes and homework are 15% of the course grade; students will receive zeroes for any quizzes and will incur late penalties (see above) for homework due if they miss class without a valid excuse. Arriving late or leaving class early may reduce or void credit for that day. For students registered for lab, attendance at all lab meetings is mandatory; in general, lab activities cannot be made up.

- ***Point System.*** To encourage and reward attendance, preparation for class and participation in class discussion, for each class students will earn 0 points for an unexcused absence, 1 point for attendance without meaningful participation (or excused absence), and 2 points for attendance with meaningful participation. At the end of the semester, assuming 40 regular class sessions, the following scale will be used to determine the proportion of class participation earned:

≥ 60 pts.	= 10%
50-59 pts.	= 8.5%
40-49 pts.	= 7.0%
30-39 pts.	= 5.5%
20-29 pts.	= 4.0%
≤ 20 pts.	= 0%

- ***Excused absences*** are those necessitated for significant medical or legal reasons, military obligation, jury duty, religious holidays, and university activities excused by the academic deans (see pages 127-129 of current MU Undergraduate Catalog), or other valid reasons to be determined by the instructor in consultation with the student. A student may receive credit, at no penalty, for an in-class writing, homework or lab assignment or quiz missed as a result of an excused absence. The student must consult with the instructor at the first opportunity following the missed class session, and complete the assignment by a reasonable date designated by the instructor. Failure by the student to complete the material by the assigned date will result in a zero for the assignment in question.
- ***Unexcused absences*** are those caused by oversleeping or other invalid reasons as determined by the instructor in consultation with the student.

### **Learning Disabled Students**

Students who require an alternative learning environment (e.g., additional time for exams), and can document such need, will be accommodated. Such students should inform the instructor of their needs no later than the first week of the semester so that arrangements can be made in advance.

### **Technology Requirements**

Students can access the instructor's web page at <http://www.science.marshall.edu/niemann/>. Important class information may also be communicated to students via their MU e-mail (i.e., [userid@marshall.edu](mailto:userid@marshall.edu)) accounts. Students should check their MU e-mail regularly for any class related messages. Basic-function calculators should be brought to class regularly and to all exams.

### **Electronic Devices**

Use of cell phones, PDA's, CD/MP3 players, etc. in class is strictly prohibited. During class such devices must be kept out of sight in a pocket, backpack, etc. *Cell phones must be set to silent mode. With the exception of basic-function calculators, use of any electronic devices during an exam will be considered evidence of cheating.* Cell phones may not be used as calculators on exams.