

## Ge Eng 371: Rock Engineering Syllabus

**INSTRUCTOR:** Norbert H. Maerz, Ph.D. P. Eng.  
Tel: 341-6714  
Fax: 341-4368  
E-Mail: [norbert@umr.edu](mailto:norbert@umr.edu)  
Web: <http://www.umr.edu/~norbert>

**CLASS TIMES:** Tues, Thurs. 9:30 - 10:45 B10 McNutt

**OFFICE HOURS:** Tues, Thurs. 9:00 – 9:30 332 McNutt  
Tues, Thurs. 10:45 – 11:00 B10 McNutt  
Any time, call ahead to make sure I'm in 214A Rock Mechanics

**PREREQUISITES:** GE 275 (Geomorphology and Terrain Analysis), and GE 50 (Geology for Engineers) or equivalent is a prerequisite. The course is intended for geology, mining, geological, and civil engineering students already equipped with an understanding of basic geology, to prepare them for geotechnically-oriented careers.

**COURSE CONTENT:** The nature of rock, groundwater, and ground stresses, and how they will affect, and be affected by construction work. Techniques of site investigation, testing and monitoring, excavation and stabilization. Quarrying and utilization of earth and rock resources. Introduction to materials behavior and design methods applied to surface and underground construction. Emphasis on essential techniques and concepts.

**SKILLS:** Students graduating from this course should be able to produce adequate engineering descriptions of rocks and logs of test pits and boreholes; plan an effective and economical site investigation; understand the techniques and principles of geotechnical design, monitoring, excavation and ground stabilization; be able to select methods appropriate for specific ground conditions and types of project; evaluate and plan the extraction of earth and rock resources; recognize the potential environmental effects of geotechnical works and how these can be minimized.

**CONCEPTS:** How the physical characteristics of geotechnical materials affect their mechanical behavior and engineering performance; the significance, nature and importance of groundwater and ground stresses; how ground conditions vary with depth below surface; scale effects between samples and in situ conditions in soils and rocks and the importance of fissures and joints; variability and uncertainty in ground characteristics and the role of monitoring; the various roles of testing; the decision-making process and empiricism in geotechnical design, and the role of analytical modeling; utilizing the self-supporting characteristics of earth and rock; different objectives of civil and mining works.

**TEXTBOOK Required:** Rock Engineering (1989) by J.A. Franklin and M.B. Dusseault, McGraw Hill, New York.

**TEXTBOOK Optional:** Rock Engineering Applications (1991) by J.A. Franklin and M.B. Dusseault, McGraw Hill, New York.

## Textbook Notes:

Rock Engineering (1989) is now out of print. Photocopies of the book are available from 119 McNutt at \$40/copy.

Rock Engineering Applications (1991) is not a required book this term. (This book is recommended for those pursuing careers in rock engineering.)

**ADDITIONAL NOTES:** All figures that are shown in class will be made available on BlackBoard

**INSTRUCTIONS, DATES, ETC ON WEBSITE:** Please check BlackBoard.

**HOMEWORK ASSIGNMENTS:** There will be more or less weekly homework assignments. Assignments will be graded on presentation, clarity and conciseness as well as on technical merit.

**FIELD TRIP:** There will be one perhaps two field trips for on campus students. Attendance is required. Trip reports may be required.

**EXAMINATIONS:** One 1.5 -hour midterm examination during class time, and one 1.5 -hour final examination.

### **METHOD OF ASSESSMENT:**

#### CLASSROOM

30% Midterm  
30% Final Exam  
30% Assignments  
10% Class Participation

#### DISTANCE ED

30% Midterm  
40% Final Exam  
30% Assignments

### **METHOD OF GRADING:**

A: 90-100%  
B: 80-89%  
C: 70-79%  
D: 60-69%  
F: <60%