

CE 331 EARTH SCIENCES

Required Course

Fall 2008

Instructor: *Name:* Gökhan Baykal
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Course Data: *Hours:* TT 12
 Room: TT: M2200

Course Description (Catalog):

CE331 Earth Sciences

(2+0+2)3

Origin of earth; formation distribution and properties of minerals and rocks. Processes of alteration; weathering; sedimentation, metamorphism. Geological structures. Use of Geological Maps. Engineering Geology.

Course Objectives (Learning Outcomes):

This course is designed to give Civil Engineering students an understanding of the processes that evolved the earth and the interaction between the civil engineering structures and earth.

Textbook:

Goodman, E. R., "*Engineering Geology; Rock in Engineering Construction*", John Wiley & Sons, 1992.

Reference Books:

Tarbuck, E., Lutgens, F., "*Earth Science*", Pearson Education, 2003

Montgomery, C. W., "*Physical Geology*", WMC Brown Publishers, 1991

West, R.T., "*Geology Applied to Engineering*", Prentice Hall Publishers, 1995

Curricular Context:

This course reviews the scientific concepts, rules and principles which are associated with planet Earth. The intention of the course is to build the necessary background for the soil mechanics and foundation engineering courses.

Laboratory and Computer Usage:

Each lecture is followed by a laboratory session. Internet usage is recommended.

Class Policies:

Laboratory Reports: 20% of the course grade.

Attendance: Full attendance to lecture and laboratories is compulsory

Midterm exam: Two midterm exam, 40% of the course grade.

Final exam: Comprehensive exam at the end of the semester, 30% of the course grade.

Quiz: Random quizzes, 10% of the course grade.

Contribution of the Course to Program Outcomes:

(a) An ability to apply knowledge of mathematics, science and engineering.

(e) An ability to identify, formulate and solve engineering problems.

(g) An ability to communicate effectively.

(k) An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

Course Assessment:

Course evaluation sheets are distributed on the last week of classes.

Week	Topics	Reading Assignments	Homework Assignment	Objectives
1	Introduction and Minerals	CH 1	Laboratory Report	To introduce the student to identification and properties of minerals with the purpose of rock classification and engineering behavior
2	Igneous Rocks	CH 6, CH 7	Laboratory Report	To familiarize the student with the formation, classification , engineering properties and behavior , case histories related to igneous rocks
3	Sedimentary Rocks	CH 4, CH 5	Laboratory Report	To familiarize the student with the formation, depositional environments, classification , engineering properties and behavior , case histories related to sedimentary rocks
4	Metamorphic Rocks	CH 8	Laboratory Report	To familiarize the student with the formation, classification , engineering properties and behavior , case histories related to metamorphic rocks
5	Engineering Properties of Rocks and Field Investigation	*	Laboratory Report	To familiarize the student with various techniques of rock testing
6	Plate Tectonics, Earthquakes	*	Kandilli Observatory Visit Report	To introduce the student the evolution and dynamics of earth, and to familiarize the students with earthquake hazard
7	Geologic Structures	CH 9	Laboratory Report	To introduce the student the identification and behavior of geologic structures
8	Geologic Maps	*	Drawing a cross section from a geologic map	To familiarize the student with the properties and the use of geologic maps
9	Groundwater and environmental geology	*	Case History	To introduce the students with hydrologic cycle, water movement and storage in soils and rocks, contamination and waste disposal
10	Slope Stability	*	Case History	To introduce the student to the basic concepts of slope stability calculations, reasons leading to slope failures and counter measures
11	Geological Considerations in Foundations on Rock	*	Case History	To present the students potential problems and measures taken for foundation design on rocks
12	Dams	*	Case History	To familiarize the student with the types, construction, environmental effects and stability problems of dams
13	Tunnels	*	Case History	To familiarize the students with the types, construction and stability of tunnels