**CE 331 EARTH SCIENCES**
Required Course
Fall 2008

**Instructor:**
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**Course Data:**
Hours: TT 12
Room: TT: M2200

**Course Description (Catalog):**
CE331 Earth Sciences (2+0+2)3

**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:**

**Reference Books:**

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