

# Syllabus for Engineering Geology CE/ENVE 3530 and GSCI 3710

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**Lecture: Tuesday, and Thursday, 9:30-10:45 am, Room: Castleman, Room 201**  
**Textbook: Geology for Engineers & Environmental Scientists, by Kehew, 3<sup>rd</sup> ed. Prentice Hall**

**Description:** Review of the origin, interior and crustal materials of Earth; the natural processes which have built Earth, deformed and torn down the crust throughout geologic time; the environmental relationships between humans and geologic processes and resources stressing application to engineering. Designed for civil and environmental engineering students, but applicable to environmental science. Strong emphasis on geotechnology and the environment.

**Grades:** Your grade will be based on the mid-term (20%) and final exams (25%), homework problems (25%) and a class project (20%). Exams will reflect your comprehension of materials covered in lecture, text readings and the homeworks. There is a subjective component of your grade (10%) pertaining to your class involvement, participation and interaction during the course.

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|-------------------------|------------------------|--|
| <b>Important Dates:</b> | March 1 <sup>st</sup>  | Exam I (date tentative)                                  |
|                         | March 8 <sup>th</sup>  | Spring Break (March 7 <sup>th</sup> – 13 <sup>th</sup> ) |
|                         | March 16 <sup>th</sup> | Submit detailed project outline (1-2 pgs)                |
|                         | April 5 <sup>th</sup>  | Exam II (date tentative)                                 |
|                         | May 6 <sup>th</sup>    | Final Exam (date tentative)                              |

## Topics covered in class:

### a) Intro, Geologic Time and Plate Tectonics

### b) Earth's Materials:

|   |         |
|---|---------|
| 1) Minerals and the Rock Cycle                  | 74-105  |
| 2) Igneous Rocks, Volcanoes                     | 106-153 |
| 3) Sedimentary Rocks and Processes              | 154-196 |
| 4) Metamorphic Rocks and Processes              | 197-214 |
| 5) Mechanics of Rock Materials, RQD             | 214-250 |
| 6) Stratigraphy, Geologic & Topo Maps           | 173-182 |
| 7) Weathering and Erosion                       | 319-347 |
| 8) Soils (mechanics highlights); Wetland; Clays | 348-394 |

### c) Geological Processes and Associated Engineering Problems:

|  |         |
|--|---------|
| 1) Tectonic processes and Structural Geology | 251-271 |
| 2) Earthquakes                               | 272-318 |
| 3) Slope processes                           | 500-543 |
| 4) Stream processes                          | 544-595 |
| 5) Coastal processes                         | 596-638 |
| 6) Groundwater                               | 396-450 |
| 7) Glacial Geology                           | 639-673 |

**Additional Topics:** Site Investigation, engineering properties of rocks, case studies, etc.

**Notes:**\* the class project will entail an engineering case study where the site specific geology controlled one of the following: 1) the nature or design of an engineered project, 2) failure of a engineered (designed) structure, or 3) environmental hazard (or potential hazard) exposed due to the reworking of earth materials.