Course Outline

Soil Mechanics
05-461
Fall 1995

Instructors:  S.C. Negi, Room: 230, Ext. 2231
             Doug Joy  Room: 223, Ext. 3048

GTA's:       Randy Little  Room: 305, Ext. 4324

Course Objectives:

After successfully completing the course the student should:

1. Know the basic properties of soils,
2. understand the mechanical behaviour of soil materials,
3. be able to design earthwork structures included slopes, foundations and retaining walls, and
4. be familiar with common laboratory and field methods of soil analysis.

Topics:

1. Soil origins and classifications
   - soil types
   - classification systems
   - lab tests
   - phase relationships
   - compaction
   - adsorption
2. Water flow through soil
   - Darcy's law
   - Permeameter tests
   - Flow nets
   - Seepage through embankments

3. Effective stress
   - Principle of effective stress
   - Stresses due to self weight
   - Quick condition

4. Soil Shear Strength
   - Coulomb's law of friction and cohesion
   - Mohr-Coulomb circle of stresses at failure
   - Shear strength tests

5. Lateral earth pressures
   - Active/passive earth pressures
   - Rankine theory
   - Design of earth-retaining structures

6. Bearing capacities of soils
   - Ultimate and allowable bearing capacities
   - Modes of shear failure
   - Bearing capacity factors
   - Footings

7. Stability of slopes
   - Stability by trial
   - Methods of slices

8. Field Methods

Course Prerequisites

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>05-223</td>
<td>Fluid Mechanics</td>
</tr>
<tr>
<td>05-212</td>
<td>Materials Science</td>
</tr>
</tbody>
</table>
Text
    Soil Mechanics, 5th Ed. R.F. Craig

Laboratory Manual
    Engineering Properties of Soils and Their Measurements (4th ed.), J.E. Bowles

Grading Scheme

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory</td>
<td>25%</td>
</tr>
<tr>
<td>Assignments</td>
<td>15%</td>
</tr>
<tr>
<td>Mid-term exam</td>
<td>25%</td>
</tr>
<tr>
<td>Final exam</td>
<td>35%</td>
</tr>
</tbody>
</table>

Note: A student must have a passing (>50%) grade on the exam portion of the course to get a passing grade in the course.

The midterm is scheduled for Thurs. Oct. 26, 17:00-19:00, MacL. 102

Late assignments and reports will be penalized 20% per day late.