Advanced Soil Mechanics–CEEN 410/510

3 Hours Credit, Room: CO 219, Time: 3:30-4:45pm

Instructor: D.V. Griffiths
Coolbaugh Hall: CO219, Tel: 273 3669, d.v.griffiths@Mines.EDU
Office Hours: T 1-3 pm and by appointment
Web: www.mines.edu/~vgriff

Advanced soil mechanics concepts and theories as applied to analysis and design in geotechnical engineering. The course has an emphasis on numerical and analytical methods.

Course Outline:

a **Seepage:** Review; Principle of effective stress; Confined flow; Flow nets; Method of Fragments; Introduction to finite difference and finite element solutions to steady seepage problems.

b **Settlement and Consolidation:** Review; Amount and rate of settlement; Boundary/initial conditions; Finite difference and finite element solutions; Sand drains.

c **Slope Stability Analysis:** Review of shear strength; Analytical Methods; Charts; Methods of Slices; Finite element slope stability software.

d **Failure Criteria for Soil:** A discussion of 3D stress states, principal stress space and stress invariants. Several failure criteria for soil are introduced including Tresca, Mohr-Coulomb and Drucker-Prager type models.

e **Introduction to Limit Analysis:** Review of limit theorems; Upper and lower bound solutions; Finite Element Limit Analysis (FELA).
Advanced Soil Mechanics–CEEN 410/510

Instructor: D.V. Griffiths
CO 252, Tel: 273 3669, d.v.griffiths@ Mines. EDU
Web: www.mines.edu/~vgriffit

Prerequisite: A first course in Soil Mechanics.

Additional reading:


Assessment:

Exam 1 One third
Exam 2 One third
Coursework One third

Grading:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 90%</td>
<td>≥ 80%</td>
<td>≥ 70%</td>
<td>≥ 60%</td>
<td>&lt; 60%</td>
</tr>
</tbody>
</table>

Exam dates:

Mid-semester TBA
End-semester TBA

Students enrolled at the 500-level will receive one additional homework assignment.

Practice questions will be handed out throughout the course but will not be graded.