The University of Southern Queensland

Course Specification

Description: Soil Mechanics

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cat-Nbr</th>
<th>Class</th>
<th>Term</th>
<th>Mode</th>
<th>Units</th>
<th>Campus</th>
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<tbody>
<tr>
<td>CIV</td>
<td>2402</td>
<td>24589</td>
<td>2, 2003</td>
<td>ONC</td>
<td>1.00</td>
<td>TW MBA</td>
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Academic Group: FOENS
Academic Org: FOES03
HECS Band: 2
ASCED Code: 030911

STAFFING
Examiner: Jim Shiau
Moderator: Mark Porter

PRE-REQUISITES
Pre-requisite: MEC2402

OTHER-REQUISITES
Prerequisites 70370

SYNOPSIS
This course contains the basic concepts of soil mechanics that apply and are widely used in Geotechnical engineering problems. All engineers working with soils must understand the range of techniques available for determining their physical and mechanical properties. It is also intended that the student will gain competence in the theory and design of common earth structures, such as slopes, shallow foundations and retaining walls.

OBJECTIVES
On completion of this course, students should be able to:

- explain the volume change properties of soils, plastic characteristics, physical properties, permeability and laboratory measurement techniques;
- describe the processes involved in the compaction of soils, and related testing techniques and computations;
- apply the concept of effective stress to some stability and stress-strain related problems in soil mechanics;
- explain the theory of one dimensional consolidation and calculate the factors involved from laboratory tests;
• discuss the failure criteria in soil mechanics and factors contributing to the shear strength of a soil and how the latter can be measured both in the field and in the laboratory;
• discuss the methods and processes involved in a simple geotechnical site investigation;
• calculate earth pressure and design a basic retaining wall;
• determine the factor of safety of slopes against shear failure;
• determine the load carrying capacity of footings having due regard to strength and settlement.

**TOPICS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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<tbody>
<tr>
<td>1. Soil Physics - mass volume relationships, particle size analysis, plasticity, soil classification.</td>
<td>5.00</td>
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<tr>
<td>2. Volume change properties of fine soils - clay minerals, swelling soils.</td>
<td>4.00</td>
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<tr>
<td>3. Permeability</td>
<td>4.00</td>
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<tr>
<td>4. Effective Stress</td>
<td>4.00</td>
</tr>
<tr>
<td>5. Consolidation</td>
<td>10.00</td>
</tr>
<tr>
<td>6. Shear Strength</td>
<td>8.00</td>
</tr>
<tr>
<td>7. Compaction</td>
<td>4.00</td>
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<tr>
<td>8. Lateral Earth Pressure - concepts of active and passive states of failure Earth pressure analyses, design of gravity and reinforced concrete retaining walls.</td>
<td>12.00</td>
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<tr>
<td>10. Flow Nets - two dimensional flow.</td>
<td>6.00</td>
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<tr>
<td>11. Stress Distribution in Soils and Applied Distribution Loading</td>
<td>12.00</td>
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<tr>
<td>12. Bearing Capacity - theoretical determination of bearing capacity, in situ determination of allowable soil pressure, stress distribution under rigid footings.</td>
<td>12.00</td>
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<tr>
<td>13. Consolidation and Immediate Settlement of Foundations</td>
<td>7.00</td>
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**TEXT and MATERIALS required to be PURCHASED or ACCESSED:**

Books can be ordered by fax or telephone. For costs and further details use the 'Book Search' facility at http://bookshop.usq.edu.au by entering the author or title of the text.

*CIV2402 Soil Mechanics External Study Package*, USQ Publication,
REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.


STUDENT WORKLOAD REQUIREMENTS

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
</tr>
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<tbody>
<tr>
<td>Assessment</td>
<td>20</td>
</tr>
<tr>
<td>Examinations</td>
<td>3</td>
</tr>
<tr>
<td>Lectures</td>
<td>26</td>
</tr>
<tr>
<td>Private Study</td>
<td>80</td>
</tr>
<tr>
<td>Tutorial</td>
<td>26</td>
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ASSESSMENT DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks Out of</th>
<th>Wtg(%)</th>
<th>Required</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSIGNMENT 1</td>
<td>150.00</td>
<td>15.00</td>
<td>Y</td>
<td>05 Sep 2003</td>
</tr>
<tr>
<td>ASSIGNMENT 2</td>
<td>150.00</td>
<td>15.00</td>
<td>Y</td>
<td>17 Oct 2003</td>
</tr>
<tr>
<td>3 HOUR OPEN EXAMINATION</td>
<td>700.00</td>
<td>70.00</td>
<td>Y</td>
<td>END S2</td>
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NOTES:

. Student Administration will advise students of the dates of their examinations during the semester.

IMPORTANT ASSESSMENT INFORMATION

1 Attendance requirements:
   It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.

2 Requirements for students to complete each assessment item satisfactorily:
   To complete each of the assessment items satisfactorily, students must obtain at least 50% of the marks available (or at least a grade of C-) for each assessment item.

3 Penalties for late submission of required work:
If students submit assignments after the due date without prior approval then a penalty of 20% of the total marks available for the assignment will apply for each working day late.

4 Requirements for student to be awarded a passing grade in the course:
To be assured of receiving a passing grade a student must attempt all of the summative assessment items, achieve at least 50% in the examination, achieve an aggregated mark of at least 40% in the total marks allocated for the assignments, and at least 50% of the available weighted marks for the summative assessment items.

5 Method used to combine assessment results to attain final grade:
The final grades for students will be assigned on the basis of the weighted aggregate of the marks (or grades) obtained for each of the summative assessment items in the course.

6 Examination information:
In an Open Examination, candidates may have access to any material during the examination except the following: electronic communication devices, bulky materials, devices requiring mains power and material likely to disturb other students.

7 Examination period when Deferred/Supplementary examinations will be held:
Any Deferred or Supplementary examinations for this course will be held during the examination period at the end of the semester of the next offering of this course.

8 University Regulations:
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL http://www.usq.edu.au/SECARIAT/calendar/Part5/ or in the printed version of the current USQ Handbook.

ASSESSMENT NOTES

1 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner.

2 Students must retain a copy of each item submitted for assessment. This must be despatched to USQ within 24 hours if required by the Examiner.

3 In accordance with University's Assignment Extension Policy (Regulation 5.6.1), the examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances.

4 The Faculty will normally only accept assessments that have been written, typed or printed on paper-based media.

5 The Faculty will NOT accept submission of assignments by facsimile.

6 Students who do not have regular access to postal services or who are otherwise disadvantaged by these regulations may be given special consideration. They should contact the examiner of the course to negotiate such special arrangements.

7 In the event that a due date for an assignment falls on a local public holiday in their area, such as a Show holiday, the due date for the assignment will be the next day.
Students are to note on the assignment cover the date of the public holiday for the Examiner's convenience.

8 Students who have undertaken all of the required assessments in a course but who have failed to meet some of the specified objectives of a course within the normally prescribed time may be awarded the temporary grade: IM (Incomplete - Make up). An IM grade will only be awarded when, in the opinion of the examiner, a student will be able to achieve the remaining objectives of the course after a period of non-directed personal study.

9 Students who, for medical, family/personal, or employment-related reasons, are unable to complete an assignment or to sit for an examination at the scheduled time may apply to defer an assessment in a course. Such a request must be accompanied by appropriate supporting documentation. One of the following temporary grades may be awarded IDS (Incomplete - Deferred Examination; IDM (Incomplete Deferred Make-up); IDB (Incomplete - Both Deferred Examination and Deferred Make-up).

10 This is a communication benchmark course and a major component of the assessment of this course will be associated with the demonstration of communication skills.

OTHER REQUIREMENTS

1 Students will require access to e-mail and internet access to USQConnect for this course.