



The University of Southern Queensland

Course specification

The current and official versions of the course specifications are available on the web at <http://www.usq.edu.au/coursespecification/current>.
Please consult the web for updates that may occur during the year.

Description: Geomechanics

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
CIV	2401	91156	2, 2009	EXT	1.00	Toowoomba

Academic group:	FOENS
Academic org:	FOES03
Student contribution band:	2
ASCED code:	030911

STAFFING

Examiner: Jim Shiau
Moderator: Guangnan Chen

RATIONALE

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SYNOPSIS

All engineers working with soils must understand the range of techniques available for determining their physical and mechanical properties. In this course, students will be introduced to the basic concepts of soil mechanics that are widely used in the design of Geotechnical engineering problems such as flow nets, soil consolidation, and shear strength of soils. The emphasis throughout the course is placed on a practical understanding of these topics.

OBJECTIVES

The course objectives define the student learning outcomes for a course. The assessment item(s) that may be used to assess student achievement of an objective are shown in parenthesis. On completion of this course, students should be able to:

1. explain the nature of soils, physical and plastic properties, compaction and laboratory measurement techniques; (Assignments 1 and 2; 2 Hour Open Examination)
2. describe the concept of effective and total stresses in saturated soils; (Assignments 1 and 2; 2 Hour Open Examination)
3. apply Darcy's Law to simple soil structures and find permeability characteristics from the provided test data; (Assignments 1 and 2; 2 Hour Open Examination)
4. employ the procedures involved in constructing flow nets to solve specific problems; (Assignments 1 and 2; 2 Hour Open Examination)
5. explain the elastic behaviour of soils; calculate the stress distribution due to external loads, and employ influence charts for calculating vertical pressures; (2 Hour Open Examination)
6. calculate the consolidation settlement under a single footing using the concept of one dimensional consolidation theory; (2 Hour Open Examination)

7. calculate elastic settlement under a variety of external loading systems; (2 Hour Open Examination)
8. describe the general concept of shear in soil; discuss the Mohr-Coulomb failure criteria and determine the shear strength parameters via laboratory test results; (2 Hour Open Examination)

TOPICS

Description	Weighting (%)
1. Introduction and Physical Properties of Soils	15.00
2. Effective Stress Concept	15.00
3. Permeability	5.00
4. Flow Nets	20.00
5. Stress Distribution in Soil	10.00
6. Consolidation of Soil	20.00
7. Settlement of Structures	10.00
8. Shear Strength of Soil	5.00

TEXT and MATERIALS required to be PURCHASED or ACCESSED

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at <http://bookshop.usq.edu.au> click 'Semester', then enter your 'Course Code' (no spaces).

Das, BM 2006, *Principles of Geotechnical Engineering*, 6th edn, Brooks/Cole, Nelson, Canada.

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.

Budhu, M 2000, *Soil Mechanics and Foundations*, Wiley, New York.

Coduto, DP 1999, *Geotechnical Engineering - Principles and Practices*, Prentice Hall, Upper Saddle River, NJ.

Craig, RF 2004, *Craig's Soil Mechanics*, 7th edn, Spon Press, London.

McCarthy, DF 2006, *Essentials of Soil Mechanics and Foundations*, 7th edn, Prentice Hall, Upper Saddle River, NJ.

Powrie, W 2004, *Soil Mechanics: Concepts and Applications*, 2nd edn, Spon Press, New York.

Whitlow, R 2001, *Basic Soil Mechanics*, 4th edn, Pearson/Prentice Hall, Harlow.

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Assessments	8.00
Directed Study	44.00
Examinations	2.00
Private Study	101.00

ASSESSMENT DETAILS

Description	Marks out of	Wtg (%)	Due date
ASSIGNMENT 1	50.00	5.00	24 Aug 2009
ASSIGNMENT 2	250.00	25.00	09 Sep 2009
2 HOUR OPEN EXAMINATION	700.00	70.00	END S2 (see note 1)

NOTES

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

IMPORTANT ASSESSMENT INFORMATION

- 1 Attendance requirements:
There are no attendance requirements for this course. However, it is the students' responsibility 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 satisfactorily complete an individual assessment item a student must achieve at least 50% of the marks or a grade of at least C-. (Depending upon the requirements in Statement 4 below, students may not have to satisfactorily complete each assessment item to receive a passing grade in this course.)
- 3 Penalties for late submission of required work:
If students submit assignments after the due date without extenuating circumstances then a penalty of 5% of the assigned mark may apply for each working day late up to a maximum of ten working days at which time a mark of zero can be recorded for that assignment.
- 4 Requirements for student to be awarded a passing grade in the course:
To be assured of receiving a passing grade in a course a student must obtain at least 50% of the total weighted marks for the course.
- 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/corporateservices/calendar/part5.htm> or in 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 produced within five days 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 one of the temporary grades: IM (Incomplete - Make up), IS (Incomplete - Supplementary Examination) or ISM (Incomplete -Supplementary Examination and Make up). A temporary 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).