



The University of Southern Queensland

## Course specification

<b>Description: Geology and Surveying</b>						
Subject	Cat-nbr	Class	Term	Mode	Units	Campus
SVY	1101	54429	2, 2006	ONC	1.00	Toowoomba

<b>Academic group:</b>	FOENS
<b>Academic org:</b>	FOES05
<b>Student contribution band:</b>	2
<b>ASCED code:</b>	031101

### STAFFING

Examiner: Shane Simmons

Moderator: Peter Gibbings

### RATIONALE

This course provides a basic introduction to geology and surveying for the students in the Bachelor of Engineering (Civil, Agricultural and Environmental programs).

### SYNOPSIS

Many engineering projects are based on the location of a planned structure (or structures) on a part of the earth's surface. Investigation and location of such projects requires knowledge and skill in both geology and surveying. Geological information affects engineering decisions in the design and planning stages because all large scale engineering works have their foundation in rock or soil. Many projects, such as dam walls and pavements are also built from these materials. A working knowledge of geologically applied design limitations is therefore required by all engineers involved in foundation, construction, hydrology, catchment management and soil science works. Surveying is an essential fundamental component in engineering planning, design, construction and monitoring processes. The construction of an engineering structure requires accurate surveying skills to guarantee the establishment, alignment and fitting of sectional components, and to ensure that all elements are positioned as designed. A knowledge of the range of skills, knowledge and roles of surveyors, together with surveying principles, some skill in performing surveys, and basic interpretation of graphical data, is therefore required by engineers.

### 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. examine and categorise a limited group of minerals and outline key identification features (Assignment Part A and Exam Paper 1);

2. examine and categorise hand specimens of rocks commonly used as construction material, assess the major physical properties, and state their material limitations in specific applications (Assignment Part A and Exam Paper 1);
3. distinguish structural properties of rocks, particularly faults folds, and joints, and interpret their significance for engineering (Assignment Part A and Exam Paper 1);
4. explain weathering processes and soil formation processes (Assignment Part A and Exam Paper 1);
5. interpret geological maps and cross sections to a limited extent and relate such information to engineering (Exam Paper 1);
6. use geophysical principles and engineering properties of rocks to appraise/survey geological materials (Exam Paper 1);
7. outline activities that are undertaken by a surveyor, and solve fundamental surveying problems using mathematical techniques (Assignment Part B and Exam Paper 2);
8. describe the legal concept of "land" and explain the legal requirements with respect to property boundary surveys (Assignment Part B and Exam Paper 2);
9. calculate and check 3-D coordinates of points from field information (Assignment Part B and Exam Paper 2);
10. calculate areas and volumes of plane figures to required accuracy (Assignment Part B and Exam);
11. describe the fundamental elements of GPS and evaluate the accuracy attainable from different GPS techniques (Exam Paper 2);
12. compare various sources of spatial information and methods of data presentation (Exam Paper 2).

## TOPICS

	Description	Weighting (%)
1.	Minerals and Rocks	20.00
2.	Structural Geology and Mapping	16.00
3.	Structure of the Earth, Historical Geology and Weathering	4.00
4.	Geomorphology	4.00
5.	Rock as Construction Materials and Site Investigations	6.00
6.	Introduction, Definitions and Basic Land Tenure	4.00
7.	Photogrammetry, GIS and Information Media	5.00
8.	Basic Surveying Equipment	3.00
9.	Levels and Levelling	8.00
10.	Distance and angular Measurement	10.00
11.	Traverse Calculations	8.00
12.	Areas and Volumes	8.00
13.	GPS	4.00

## **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).

*SVY1101 Geology and Surveying External Study Package*, USQ Publication,  
West, TR 1995, *Geology Applied to Engineering*, Prentice Hall, Englewood Cliffs, New Jersey.

## **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.

Bannister, A & Raymond 1998, *Surveying*, 7th edn, Longman Scientific & Technical, Essex, England.

Irvine, W 1995, *Surveying for Construction*, 4th edn, McGraw-Hill,

McCormac, JC 1991, *Surveying Fundamentals*, 2nd edn, Prentice Hall,

McLean, AC & Gribble, CD 1985, *Geology for Civil Engineers*, 2nd edn, Allen and Unwin, London.

Muskett, J 1988, *Site Surveying*, BSP Professional Books,

Press, F & Siever, R 1986, *Earth*, WH Freeman, New York.

Skinner, BJ & Porter, SC 1995, *The Blue Planet: An Introduction to Earth Systems Science*, Wiley,

Stevens, NC 1975, *A Guide to Field Geology in South East Queensland*, USQ Press, Toowoomba.

## **STUDENT WORKLOAD REQUIREMENTS**

ACTIVITY	HOURS
Assessment	40.00
Examinations	4.00
Laboratory or Practical Classes	24.00
Lectures	39.00
Private Study	48.00

## ASSESSMENT DETAILS

Description	Marks out of	Wtg(%)	Due date
ASSIGNMENT PART A - GEOLOGY	200.00	20.00	13 Sep 2006
ASSIGNMENT PART B - SURVEYING	200.00	20.00	09 Oct 2006
2 HR OPEN EXAM PAPER 2 (SURV)	300.00	30.00	END S2
2 HR OPEN EXAM PAPER 1 (GEOL)	300.00	30.00	END S2 (see note 1)

### NOTES

1. Exam Part A (Geology) is equivalent to Exam Paper 1. Exam Part B (Surveying) is equivalent to Exam Paper 2. 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 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 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 achieve at least 30% in all of the weighted assessment items, achieve a total mark of at least 45% in Part A and 45% in Part B of the examination, and at least 50% of the total weighted marks available for the assessment items. The following statement would be appropriate for courses using the non-stratified grading (Pass/Fail) system:
- 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. In a Restricted Examination, candidates are allowed access to specific materials during the

examination. The only materials that candidates may use in the restricted examination for this course are: writing materials (non-electronic and free from material which could give the student an unfair advantage in the examination); calculators which cannot hold textual information (students must indicate on their examination paper the make and model of any calculator(s) they use during the examination).

- 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 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 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).