The University of Southern Queensland

Course specification

This version produced 20 Dec 2007.
The current and official versions of the course specifications are available on the web at
Please consult the web for updates that may occur during the year.

Description: Geology and Surveying

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cat-nbr</th>
<th>Class</th>
<th>Term</th>
<th>Mode</th>
<th>Units</th>
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<td>SVY</td>
<td>1101</td>
<td>66383</td>
<td>2, 2007</td>
<td>EXT</td>
<td>1.00</td>
<td>Toowoomba</td>
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**Academic group:** FOENS
**Academic org:** FOES05
**Student contribution band:** 2
**ASCED code:** 031101

**STAFFING**
Examiner: Glenn Campbell
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**
On completion of this course students will 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

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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<tbody>
<tr>
<td>1. Minerals and Rocks</td>
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<tr>
<td>2. Structural Geology and Mapping</td>
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<td>3. Structure of the Earth, Historical Geology and Weathering</td>
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<td>4. Geomorphology</td>
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<td>5. Rock as Construction Materials and Site Investigations</td>
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<tr>
<td>6. Introduction, Definitions and Basic Land Tenure</td>
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<td>7. Photogrammetry, GIS and Information Media</td>
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<tr>
<td>8. Basic Surveying Equipment</td>
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<tr>
<td>9. Levels and Levelling</td>
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<tr>
<td>10. Distance and angular Measurement</td>
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<tr>
<td>11. Traverse Calculations</td>
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<tr>
<td>12. Areas and Volumes</td>
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</tr>
<tr>
<td>13. GPS</td>
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</table>

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).

College Geological Specimen Kit.

**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>
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<tbody>
<tr>
<td>Assessment</td>
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<tr>
<td>Directed Study</td>
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<tr>
<td>Examinations</td>
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<td>Private Study</td>
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ASSESSMENT DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks out of</th>
<th>Wtg(%)</th>
<th>Due date</th>
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<tbody>
<tr>
<td>ASSIGNMENT PART A - GEOLOGY</td>
<td>200.00</td>
<td>20.00</td>
<td>10 Sep 2007</td>
</tr>
<tr>
<td>ASSIGNMENT PART B - SURVEYING</td>
<td>200.00</td>
<td>20.00</td>
<td>08 Oct 2007</td>
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<tr>
<td>2 HR OPEN EXAM PAPER 2 (SURV)</td>
<td>300.00</td>
<td>30.00</td>
<td>END S2</td>
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<tr>
<td>2 HR OPEN EXAM PAPER 1 (GEOL)</td>
<td>300.00</td>
<td>30.00</td>
<td>END S2</td>
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</tbody>
</table>

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:
   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 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).