Description: Engineering Problem Solving 2

<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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<tr>
<td>ENG</td>
<td>2102</td>
<td>24568</td>
<td>2, 2003</td>
<td>EXT</td>
<td>1.00</td>
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Academic Group: FOENS
Academic Org: FOENSV
HECS Band: 2
ASCED Code: 039999

STAFFING
Examiner: Doug Baddeley
Moderator: Mark Porter

PRE-REQUISITES
Pre-requisite: ENG1101

RATIONALE
This is the second of four courses that use a `problem based learning approach` to extend the students knowledge of the complex world of engineering. In course ENG1101 Engineering Problem Solving 1, the student was introduced to the concept of systems analysis and used a number of given case studies to acquire some basic knowledge and skills. This course now enhances the students skills in team-work, systems analysis and engineering problem solving. The four courses seek to continuously develop distinct engineering skills that surround and incorporate a range of different content material. Student learning is to be driven by the need to solve various engineering problems. The student learning experience will be different in this course to other more traditionally taught courses in the program. The principles of problem-based learning acknowledge prior knowledge and encourage self-directed learning. Today's engineers must actively pursue life-long learning which requires this latter attribute. Thus students will `learn how to learn' so that they are better able to apply problem-solving to new situations in the workplace and in the community throughout their professional career. This course is intended to develop the student's skills in problem solving within an engineering context. A number of real world problems are analysed in a systematic way. It is intended that this course will develop a student's ability for independent learning. The student will undertake a sequence of problems, working as part of a team under the supervision of the examiner.
SYNOPSIS
This course will increase a student's ability to work as part of an engineering team. It presents a range of engineering theory and application that is learnt within the context of solving a range of real world problems. This course focusses primarily on the use of statistical analysis to solve problems and to evaluate solutions. In addition the student is required to further develop their computer skills to illustrate and present the results of their work.

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

• work as part of a team to analyse, research, synthesise and evaluate solutions for technical problems and systems;
• contribute as part of a team working on defined engineering and surveying problems;
• appraise and reflect on team roles and group dynamics;
• work within resource and time limitations;
• work as part of a team to apply appropriate scientific and mathematical techniques to explain phenomena encountered in the set range of problems;
• work as part of a team to apply systems analysis to defined engineering and surveying problems;
• analyse, evaluate and present statistical data;
• communicate findings in an appropriate technical format.
TOPICS

Description Weighting (%)  
1. ENGINEERING AND SURVEYING PROBLEM SOLVING Analyse, research, propose and evaluate solutions, for technical problems/systems as part of a team. Particular skills to be developed/enhanced will vary for each individual and may include the use of the computer as a tool for problem solving, research and presenting material in a professional manner; basic statistics applied to given or researched data; and physical science as a tool for understanding complex systems. Specific topics may include:

1.1. Spreadsheets and Wordprocessing.

1.2. Use of the Internet.

1.3. Use of the WWW and Library facilities.

1.4. Statistical Distributions.

1.5. Statistical Relationships.

1.6. Producing and Evaluating Statistical Data.

1.7. Map Interpretation.

1.8. Basic Electromagnetic Theory.

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.

Students will need access to a computer for this course with the following facilities: access to the Internet and email on a weekly basis; Microsoft Office software or similar.

Smith, K. A 2000, Project Management and Teamwork, McGraw Hill,
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>
<td>45</td>
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<tr>
<td>Directed Study</td>
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ASSESSMENT DETAILS

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<th>Description</th>
<th>Marks Out of</th>
<th>Wtg(%)</th>
<th>Required</th>
<th>Due Date</th>
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<tr>
<td>REPORT 1</td>
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<td>22 Aug 2003</td>
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<td>REPORT 2</td>
<td>300.00</td>
<td>30.00</td>
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<td>19 Sep 2003</td>
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<td>REPORT 3</td>
<td>300.00</td>
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<td>24 Oct 2003</td>
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<td>PORTFOLIO OF REFLECTIONS</td>
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<td>20.00</td>
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IMPORTANT ASSESSMENT INFORMATION

1 Attendance requirements:
This course employs a team based approach to learning in which students are expected to participate in small groups towards the solution of a number of engineering problems. External students are expected to participate in their assigned group's activities through the USQConnect electronic discussion group facility on a weekly basis.

2 Requirements for students to complete each assessment item satisfactorily:
To complete each assessment item satisfactorily, students must be judged to have made a genuine effort to contribute to the work by their team members. All three reports must be submitted electronically on or before the due date.

3 Penalties for late submission of required work:
Because model answers are published promptly after the due date, the penalty for late submission of reports will be the loss of all marks awarded for the report. If students submit portfolios after the due date without prior approval then a penalty of 20% of the total marks available for the portfolio 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 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:
There is no examination in this course.

7 Examination period when Deferred/Supplementary examinations will be held:
Not applicable.

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 In this course students may submit assignments electronically in the format specified in the assignment requirements.

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 The required standard of communication skills must be demonstrated in order for a passing grade to be achieved.

OTHER REQUIREMENTS

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

2 Students are required to prepare a portfolio of reflections on their individual learning in the course. This portfolio may be audited and the examiner may require any student to submit this portfolio from week 6 onwards.