### Description: Engineering Problem Solving 1

<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>1101</td>
<td>20547</td>
<td>1, 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: Lyn Brodie  
Moderator: Mark Porter

### SYNOPSIS

This course introduces the student to some important measurement and analytical tools that will provide the basis for future work. The student will be introduced to the concept of a system and to the need for teamwork in most engineering activities. Aspects of physical properties are explained together with statistical concepts and both these are applied to the analysis of complex systems. The course is presented as an initial introduction to problem based learning, and the use of teamwork is emphasized throughout. All students are expected to contribute to and interact in a positive manner with other team members. This interaction is assessed.

### OBJECTIVES

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

- co-operate in a team working on defined technical problems;
- identify the requirements for leadership in a successful team;
- apply an understanding of group dynamics by negotiating, establishing and documenting roles and timelines for a given task;
- seek and evaluate the input of other team members;
- apply prior knowledge and experience to assist in solving a problem as part of a team, recognising the value of prior knowledge from team members with diverse backgrounds;
- identify and use appropriate scientific and mathematical techniques and procedures to explain phenomena encountered in the set range of problems;
- communicate results in a professional manner;
- outline the requirements for measuring physical properties;
- apply basic statistics to analyse measurements and examine the variation that occurs in properties;
- distinguish between "data" and "information";
- use a computer for general communication and the production of technical reports;
- define the concepts of Systems Analysis;
- apply systems analysis to well defined simple systems/problems;
- evaluate and solve simple technical problems.

**TOPICS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ENGINEERING AND PROBLEM SOLVING Solve/analyse a number of 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; basic physics as a tool for understanding complex systems and an introduction to measurement. Specific topics may include:</td>
<td>100.00</td>
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<tr>
<td>1.1. Windows Operating System.</td>
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<tr>
<td>1.2. Computer Terminology.</td>
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<td>1.3. Spreadsheets and Wordprocessing.</td>
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<td>1.4. Use of the Internet.</td>
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<td>1.5. Use of the WWW and Library facilities.</td>
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<td>1.6. Statistical Distributions.</td>
<td></td>
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<td>1.7. Statistical Relationships.</td>
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<td>1.8. Producing Statistical Data.</td>
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<tr>
<td>1.9. Introduction to Measurement and SI courses.</td>
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</table>
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.

Eide, A. R., Jenison, R. D., Mashaw, L. H. & Northup, L. L. Introduction to Engineering Problem Solving, McGraw Hill,


Smith, K. A. 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.

Granlaw, R. & Hepp, E. Introduction to the Internet for Engineers, McGraw Hill,

STUDENT WORKLOAD REQUIREMENTS

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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</thead>
<tbody>
<tr>
<td>Assessment</td>
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<tr>
<td>Directed Study</td>
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<tr>
<td>Tutorial</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>
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<tr>
<td>REPORT 1</td>
<td>150.00</td>
<td>15.00</td>
<td>Y</td>
<td>24 Mar 2003</td>
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<tr>
<td>REPORT 2</td>
<td>200.00</td>
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<td>14 Apr 2003</td>
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<td>REPORT 3</td>
<td>200.00</td>
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<tr>
<td>REPORT 4</td>
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<td>25.00</td>
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<td>02 Jun 2003</td>
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<td>PORTFOLIO OF REFLECTIONS</td>
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<td>20.00</td>
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</tr>
</tbody>
</table>

IMPORTANT ASSESSMENT INFORMATION

1 Attendance requirements:

This course employs a team-based approach to learning in which students must participate in small groups towards the solution of a number of technical problems. To meet the team based objectives of the course, students must participate in their assigned group activities through the USQ electronic discussion group for the
course on at least a weekly basis. Contributions to this group will be monitored and assessed.

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:
   (i) Team projects peer and self assessment forms and individual portfolios submitted after the due date will not be assessed. (ii) Non submission of peer and self assessment forms will result in zero marks for individual effort in the team project.

4 Requirements for students to be awarded a passing grade in the course:
   (i) To be assured of receiving a passing grade a student must achieve at least 30% in each of the summative assessments and at least 50% of the available weighted marks for the summative assessment items. (ii) Students who do not qualify for a Passing grade may, at the discretion of the Examiner, be assigned additional work to demonstrate to the Examiner that they have achieved the required standard. It is expected that such students will have gained at least 45% of the total marks available for all 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 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 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.

5 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.

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 is auditable and the examiner may require any student to submit this portfolio from week 8 onwards. The portfolio will be further developed in subsequent Problem Based Learning courses.

3 The time specified in Student Workloads allocated to tutorials/workshops should be dedicated to interaction/communication with other team members.