Description: Materials Technology

<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>
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<td>3203</td>
<td>20575</td>
<td>1, 2003</td>
<td>EXT</td>
<td>1.00</td>
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Academic Group: FOENS
Academic Org: FOES02
HECS Band: 2
ASCED Code: 030305

STAFFING
Examiner: Doug Baddeley
Moderator: Bob Fulcher

PRE-REQUISITES
Pre-requisite: MEC1201

OTHER-REQUISITES
Prerequisites 70245

SYNOPSIS
The engineer uses a wide variety of materials from platinum to rocks to construct bridges, automobiles, jet engines, process plants, electronic components, etc. These materials have widely varying properties and consequently it is necessary for the engineer to have a sound working knowledge of the characteristic properties and behaviour during processing/fabrication and in service of the common types of engineering materials. This course extends the basic course "Engineering Materials", to show how the basic principles of materials science are used in the development of contemporary engineering materials.

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

- appraise the characteristic properties, applications and behaviour during fabrication and service of a wide range of engineering materials;
- specify a suitable material for a given application;
- evaluate the effects of stress state, temperature, corrosion, and wear on materials;
- examine forms and effects of corrosion in metals and review the main methods of corrosion prevention;
• assess the effects of welding on the properties of a welded component and the methods used to ensure a sound weld;
• examine the basic principles, typical properties and applications of composite materials;
• apply basic procedures used in the failure analysis of a component and in the selection of a material for a given component.

TOPICS

<table>
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<th>Description</th>
<th>Weighting (%)</th>
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<tr>
<td>1. Steel Types</td>
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<tr>
<td>2. Strengthening Mechanisms</td>
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<tr>
<td>3. Corrosion of Metals</td>
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<td>4. Wear of Materials</td>
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<tr>
<td>5. Failure Analysis, Fatigue and Creep</td>
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<tr>
<td>6. Joining of Materials</td>
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<tr>
<td>7. Composites</td>
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<tr>
<td>8. Materials Selection</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.

A hand held battery operated calculator which does not have keys for the alphabet.


STUDENT WORKLOAD REQUIREMENTS

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tr>
<td>Assessment</td>
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<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>
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<tr>
<th>Description</th>
<th>Marks Out of</th>
<th>Wtg(%)</th>
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<th>Due Date</th>
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<tr>
<td>ASSIGNMENT 1</td>
<td>50.00</td>
<td>5.00</td>
<td>Y</td>
<td>26 Mar 2003</td>
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<tr>
<td>ASSIGNMENT 2</td>
<td>100.00</td>
<td>10.00</td>
<td>Y</td>
<td>09 May 2003</td>
</tr>
<tr>
<td>ASSIGNMENT 3</td>
<td>150.00</td>
<td>15.00</td>
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<td>05 Jun 2003</td>
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<td>3 HOUR RESTRICTED</td>
<td>700.00</td>
<td>70.00</td>
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<td>END S1</td>
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NOTES:

- 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 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:
   If students submit assignments after the due date without prior approval then a penalty of 5% 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 a passing grade, students must demonstrate, via the summative assessment items, that they have achieved the required minimum standards in relation to the objectives of the course by: (i) satisfactorily completing the examination and assignments; and (ii) obtaining at least 50% of the total weighted 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:
   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).
examination); Translation dictionary. With the Examiner's approval, candidates may take an appropriate non-electronic translation dictionary into the examination. This will be subject to perusal and, if it is found to contain annotations or markings that could give the candidate an unfair advantage, it may be removed from the candidate's possession until the appropriate disciplinary action is completed.

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/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 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 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 Faculty of Engineering and Surveying does not offer supplementary examinations.