The University of Southern Queensland

Course specification

The current and official versions of the course specifications are available on the web at <http://www.usq.edu.au/coursespecification/current>

Please consult the web for updates that may occur during the year.

Description: Engineering Fundamentals

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cat-nbr</th>
<th>Term</th>
<th>Mode</th>
<th>Units</th>
<th>Campus</th>
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<tbody>
<tr>
<td>ENG</td>
<td>1500</td>
<td>1, 2010</td>
<td>EXT</td>
<td>1</td>
<td>Toowoomba</td>
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</table>

Academic group: FOSCI
Academic org: FOS003
Student contribution band: 2
ASCED code: 039999

STAFFING

Examiner: Tim Passmore
Moderator: Lyn Brodie

OTHER REQUISITES

Current skills at the level of Queensland Senior Secondary School Studies Maths A or equivalent assumed. This course is substantially equivalent to MAT1000 and MAT1001. Students cannot enroll in ENG1500 if they have successfully completed, or are currently enrolled in, either MAT1000 or MAT1001.

RATIONALE

Students entering tertiary studies in engineering and surveying require expertise in mathematics, physics and problem solving. This course will provide students with basic mathematical and physics competencies for the fundamentals of tertiary studies in engineering and surveying.

SYNOPSIS

This course integrates mathematical and physics concepts to provide students with an introduction to the fundamentals for engineering and surveying. Topics included are: basic arithmetic, measurement, basic algebra, functions and graphing, exponential, logarithmic and trigonometric functions, force and electricity.

OBJECTIVES

On successful completion of this course the student will be able to:

1. demonstrate a sound understanding of a number of mathematical and physics topics that are essential for the fundamentals of tertiary studies in engineering and surveying;
2. interpret and solve a range of authentic simple engineering problems involving mathematical and physics concepts relevant to this course;
3. effectively communicate the mathematical and physics concepts and arguments contained in this course.
## TOPICS

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction - role of mathematics and physics in engineering and surveying, mathematical communication</td>
<td>2.00</td>
</tr>
<tr>
<td>2. Arithmetic - real numbers, order of operations, calculations, fractions, scientific notation, metric system, index laws, absolute value</td>
<td>10.00</td>
</tr>
<tr>
<td>3. Algebra - algebraic indices and fractions, solving linear and quadratic equations, factorisation, simultaneous equations</td>
<td>18.00</td>
</tr>
<tr>
<td>4. Relations and Functions - analytical geometry, definition of functions and relations, graphs of straight lines, parabolas, graphical solution of equations</td>
<td>15.00</td>
</tr>
<tr>
<td>5. Exponential and Logarithmic Functions - exponential and logarithmic functions and graphs, solution of exponential and logarithmic equations</td>
<td>10.00</td>
</tr>
<tr>
<td>6. Trigonometry - trigonometric ratios and basic identities, solution of triangles, trigonometric functions and graphs, solution of trigonometric equations</td>
<td>15.00</td>
</tr>
<tr>
<td>7. Length, Time and Mass - systems of Units, measurement of length, area and volume, measurement of time, periods and frequencies, parameters involving length and time, measurement of mass, density, mass flow rate.</td>
<td>10.00</td>
</tr>
<tr>
<td>8. Force - Force, Newton's Laws, pressure, stress, moment, torque, work</td>
<td>10.00</td>
</tr>
<tr>
<td>9. Electricity - electric current, voltage, resistance, Ohm's Law, direct current and alternating current, electric circuits, electrical components, electric motors</td>
<td>10.00</td>
</tr>
</tbody>
</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).

(Mathematical calculator.)

Mathematics Study Book2010, *Course ENG1500 Engineering Fundamentals*, USQ Distance Education Centre, Toowoomba.


Physics Study Book2010, *Course ENG1500 Engineering Fundamentals*, USQ Distance Education Centre, Toowoomba.
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.

(Any College Algebra or Pre-Calculus text will be helpful.)

(Any high school mathematics text will be helpful.)

(The text used for Engineering Mathematics 1, 2 and 3: Modern Engineering Mathematics, 4th edition, Glyn James, Pearson (Prentice Hall).)

STUDENT WORKLOAD REQUIREMENTS

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
</tr>
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<tbody>
<tr>
<td>Assessments</td>
<td>30.00</td>
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<tr>
<td>Directed Study</td>
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</table>

ASSESSMENT DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks out of</th>
<th>Wtg (%)</th>
<th>Due date</th>
<th>Objectives assessed</th>
<th>Graduate skill</th>
<th>Level assessed</th>
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<tbody>
<tr>
<td>ASSIGNMENT 1</td>
<td>20</td>
<td>5</td>
<td>15 Mar 2010</td>
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<td></td>
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<tr>
<td>ASSIGNMENT 2</td>
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<td>ASSIGNMENT 3</td>
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<tr>
<td>2 HOUR OPEN EXAMINATION</td>
<td>120</td>
<td>65</td>
<td>END S1 (see note 1)</td>
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</table>

NOTES

1. Examination dates will be available during the Semester. Students must refer to Examination timetable when published.

IMPORTANT ASSESSMENT INFORMATION

1 Attendance requirements:
   It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, workshops, 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 complete each of the assignments satisfactorily, students must obtain at least 50% of the marks available for the assignment.

3 Penalties for late submission of required work:
   If students submit assignments after the due date without (prior) approval of the examiner then a penalty of 5% of the total marks gained by the student for the assignment may apply.
for each working day late up to ten working days at which time a mark of zero may be recorded. No assignments will be accepted after model answers have been posted.

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 total weighted marks available for the course.

5 Method used to combine assessment results to attain final grade:
The final grades for students will be assigned on the basis of the aggregate of the weighted marks obtained for each of the summative assessment items in the course.

6 Examination information:
An Open Examination is one in which candidates may have access to any printed or written material and a calculator 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 next examination period.

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 Students will require access to e-mail and web access to UConnect for this course.

2 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. Students must retain a copy of each item submitted for assessment. This must be produced within 24 hours if required by the Examiner. The Examiner may grant an extension of the due date of an assignment in extenuating circumstances.

3 The Faculty will normally only accept assessments that have been written, typed or printed on paper-based media. The Faculty will NOT accept submission of assignments by facsimile.

4 The referencing system to be used in this course is supported by the Department. Information on this referencing system and advice on how to use it can be found in the course materials.