



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

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
ENG	1500	87446	1, 2009	ONC	1.00	Toowoomba

<b>Academic group:</b>	FOSCI
<b>Academic org:</b>	FOS003
<b>Student contribution band:</b>	2
<b>ASCED code:</b>	039999

### STAFFING

Examiner: Tim Passmore

Moderator: Lyn Brodie

### OTHER REQUISITES

Queensland Senior Secondary School Studies Maths A or equivalent assumed.

### 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 (Assignments, Exam);
2. interpret and solve a range of authentic simple engineering problems involving mathematical and physics concepts relevant to this course (Assignments, Exam);
3. effectively communicate the mathematical and physics concepts and arguments contained in this course (Assignments, Exam).

## TOPICS

	Description	Weighting (%)
1.	Introduction - role of mathematics and physics in engineering and surveying, mathematical communication	2.00
2.	Arithmetic - real numbers, order of operations, calculations, fractions, scientific notation, metric system, index laws, absolute value	10.00
3.	Algebra - algebraic indices and fractions, solving linear and quadratic equations, factorisation, simultaneous equations	18.00
4.	Relations and Functions - analytical geometry, definition of functions and relations, graphs of straight lines, parabolas, graphical solution of equations	15.00
5.	Exponential and Logarithmic Functions - exponential and logarithmic functions and graphs, solution of exponential and logarithmic equations	10.00
6.	Trigonometry - trigonometric ratios and basic identities, solution of triangles, trigonometric functions and graphs, solution of trigonometric equations	15.00
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.	10.00
8.	Force - Force, Newton's Laws, pressure, stress, moment, torque, work	10.00
9.	Electricity - electric current, voltage, resistance, Ohm's Law, direct current and alternating current, electric circuits, electrical components, electric motors	10.00

## 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).

Scientific calculator.

Mathematics Study Book 2009, *Course ENG1500 Engineering Fundamentals*, USQ Distance Education Centre, Toowoomba.

Physics Study Book 2009, *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 high school mathematics text will be helpful.

Any College Algebra or Pre-Calculus 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

ACTIVITY	HOURS
Assessments	30.00
Lectures	26.00
Private Study	80.00
Tutorials	26.00

## ASSESSMENT DETAILS

Description	Marks out of	Wtg (%)	Due date
ASSIGNMENT 1	20.00	5.00	16 Mar 2009
ASSIGNMENT 2	100.00	15.00	20 Apr 2009
ASSIGNMENT 3	100.00	15.00	01 Jun 2009
CMA's	100.00	0.00	12 Jun 2009
2 HOUR OPEN EXAMINATION	120.00	65.00	END S1 (see note 1)

### 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 USQConnect 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.