



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: Electrical Technology

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
ELE	1801	90289	2, 2009	EXT	1.00	Toowoomba

<b>Academic group:</b>	FOENS
<b>Academic org:</b>	FOES04
<b>Student contribution band:</b>	2
<b>ASCED code:</b>	031301

### STAFFING

Examiner: Ron Sharma  
Moderator: Tony Ahfock

### REQUISITES

Pre-requisite: ENG1500 or MAT1500

### SYNOPSIS

Electrical engineering is about the use of electrical and electronic technology to achieve most of our daily needs. To understand how electricity is used to achieve these needs, in Electrical Technology, students are provided with a working knowledge of electrical components, machines, power supply systems and safety devices commonly encountered in the workplace. Analysis of DC and AC circuits, transformers, motors, generators, power supply systems, batteries and rectifiers form part of the work.

### OBJECTIVES

The course objectives define the student learning outcomes for a course. The assessment item(s) that may be used to assess student achievement of an objective are shown in parenthesis. On completion of this course, students should be able to:

1. explain the physical basis of common electrical devices and apply the basic laws and conventions governing them to solve simple energy conversion problems (Assignment 1 and Exam);
2. select common electrical components, devices and signal sources for use in simple DC and AC circuits (Assignment 1);
3. analyse simple DC circuits using Kirchhoff's Laws and network theorems (Assignment 1 and Exam);
4. calculate m.m.f, flux density reluctance, force torque, induced e.m.f. related to magnetic circuits (Assignment 1 and Exam);
5. determine the no-load and on-load characteristics of DC motors and generators (Assignment 1 and Exam);
6. analyse simple single phase and three phase AC circuits (Assignment 2 and Exam);

7. construct phasor diagrams and use phasors to analyse single phase and three phase circuits (Assignment 2 and Exam);
8. predetermine the performance of transformers using given equivalent circuit data (Assignment 2 and Exam);
9. explain and compare the principles of operation and the applications of AC motors and generators (Exam);
10. distinguish between, and explain the applications of, different protection devices.

## TOPICS

	Description	Weighting (%)
1.	Energy Terminology - Mechanics - Heating	3.00
2.	Electrostatics - Capacitors - Insulation - Lightning	3.00
3.	Electric Conductors - Resistors - Batteries	3.00
4.	Direct Current Circuits - Laws - Theorems - Applications	12.00
5.	Electromagnetics - Inductors - EMF - Cores	4.00
6.	Direct Current Machines - Motors - Performance Tests	10.00
7.	Alternating Currents - Phasors - Power Components	10.00
8.	AC Circuits - Resonance - Rectifiers - Lamps	10.00
9.	DC and AC Measurements	4.00
10.	Transformers - Tests - Analysis - Applications	10.00
11.	Three phase systems - Phasors - Connections - Power	10.00
12.	AC Motors - Generators - Principles - Tests	16.00
13.	Supply Systems - Earthing - Safety Devices	5.00

## 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).

Nil.

## 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.

Carlson, AB & Gisser, DG 1990, *Electrical Engineering: Concepts and Applications*, 2nd edn, Addison Wesley, Reading, MA.  
(Student Edition)

Cathey, JJ 1997, *Schaum's Outline of Theory and Problems of Basic Electrical Engineering*, 2nd edn, McGraw Hill, New York.

Chapman, SJ 2003, *Electric Machinery Fundamentals*, 4th edn, McGraw Hill, Boston.

Dorf, RC & Svoboda, JA 2004, *Introduction to Electric Circuits*, 6th edn, John Wiley, New York.

McKenzie Smith, I 2005, *Hughes Electrical Technology*, 9th edn, Pearson Prentice Hall, Harlow.

Morley, A & Hughes, E 1994, *Principles of Electricity*, 5th edn, Longman Scientific and Technical, Harlow, UK.

(revised by Bolton, W)

Morris, NM 1994, *Electrical and Electronic Engineering Principles*, Longman Scientific and Technical, Harlow, UK.

Paul, C, Naser, S & Unneweher, L 1992, *Introduction to Electrical Engineering*, 2nd edn, McGraw Hill, New York.

Roadstrum, WH & Wolaver, DH 1994, *Electrical Engineering for all Engineers*, 2nd edn, John Wiley, New York.

Robbins, AH & Miller, WC 2004, *Circuit analysis with devices; theory and practice*, Thomson/Delmar Learning, Clifton Park, NY.

Simpson, CD 1992, *Introduction to Electric Circuits and Machines*, Prentice Hall, Englewood Cliffs, Scarborough, Ont.

Wildi, T 1997, *Electrical Power Technology*, 3rd edn, John Wiley, New York.

## STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Assessments	20.00
Directed Study	83.00
Examinations	2.00
Private Study	35.00
Report Writing	15.00

## ASSESSMENT DETAILS

Description	Marks out of	Wtg (%)	Due date
ASSIGNMENT 1	200.00	20.00	31 Aug 2009
ASSIGNMENT 2	200.00	20.00	12 Oct 2009
2 HOUR RESTRICTED EXAMINATION	600.00	60.00	END S2 (see note 1)

### NOTES

1. Student Administration will advise students of the dates of their examinations during the semester.

## IMPORTANT ASSESSMENT INFORMATION

- 1 Attendance requirements:
  - (i) 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.
  - (ii) Students must attend and complete the requirements of the Workplace Health and Safety training program for this course before they are able to undertake any practical work in the electrical laboratories.
- 2 Requirements for students to complete each assessment item satisfactorily:

To satisfactorily complete an individual assessment item a student must achieve at least 50% of the marks or a grade of at least C-. (Depending upon the requirements in Statement 4 below, students may not have to satisfactorily complete each assessment item to receive a passing grade in this course.)
- 3 Penalties for late submission of required work:

If students submit assignments after the due date without extenuating circumstances then a penalty of 5% of the assigned mark may apply for each working day late up to a maximum of ten working days at which time a mark of zero can be recorded for that assignment.
- 4 Requirements for student to be awarded a passing grade in the course:

To be assured of receiving a passing grade in a course a student must obtain at least 50% of the total weighted marks 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/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); Formula sheets.
- 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/corporateservices/calendar/part5.htm> or in 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 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 one of the temporary grades: IM (Incomplete - Make up), IS (Incomplete - Supplementary Examination) or ISM (Incomplete -Supplementary Examination and Make up). A temporary 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).

## **OTHER REQUIREMENTS**

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