



The University of Southern Queensland

Course Specification

Description: Electromagnetics

Subject	Cat-Nbr	Class	Term	Mode	Units	Campus
PHY	2201	10401	1, 2002	ONC	1.00	TWMBBA

Academic Group:	FOSCI
Academic Org:	FOS002
HECS Band:	2
ASCED Code:	010301

STAFFING

Examiner: Jeff Sabburg

Moderator: Brad Carter

PRE-REQUISITES

Pre-requisite: MAT 1100 or MAT 1102 and PHY 1103

RATIONALE

With a wide range of D.C. and A.C. electrical and electronic equipment used in the workplace a knowledge of the fundamentals of electricity and magnetism is important for today's scientist. This course introduces students to electromagnetic theory, electrical measurement and sensors.

SYNOPSIS

This course builds upon a previous knowledge of both physics and mathematics to consolidate a rigorous understanding of both circuit and electromagnetic theory. Some of the topics covered include Electrostatics, Current Electricity, Magnetism, A.C. Circuits and Maxwell's equations.

OBJECTIVES

On completion of this course students will be able to:

- analyse D.C. and A.C. circuits using the laws applicable to such analysis.
- demonstrate skills and knowledge required to perform laboratory experiments safely with appropriate equipment.
- understand basic electromagnetic theory.

TOPICS

Description	Weighting (%)
1. Electrostatics - charges, fields, potential - capacitance, dielectrics.	28.00
2. Current Electricity - current, resistance, power - d.c. circuits, Kirchhoff's Rules, - instruments and measurements.	28.00
3. Magnetism - moving charge in a field - force on current carrying conductor.	16.00
4. Electromagnetic Induction & AC Circuits - induced EMF, transformers - inductance - R-L-C circuits - Resonance, frequency response.	21.00
5. Electromagnetic Theory - Maxwell's equations	7.00

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.

Laboratory Manual for Electromagnetics, USQ Publication.

Popovic, Z. and Popovic, B., 2000 *Introductory Electromagnetics*, Prentice Hall, NJ.

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.

Dugdale, D.E. 1993 *Essentials of Electromagnetism*, MacMillan, N.Y., (537 DUG),

Fishbane, P.M., Gasiorowicz, S. & Thornton, S.T. 1996 *Physics for Scientists and Engineers*, 2nd ed., Prentice Hall, Upper Saddle River, N.J.

Giancoli, D.C., 1998 *Physics - Principles with Applications*, 5th edn, Prentice Hall.

Kraus, J.D. 1992 *Electromagnetics*, 4th edn, McGraw-Hill, N.Y., (621.3 KRA),

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Examinations	3
Laboratory or Practical Classes	20
Private Study	85
Report Writing	20
Tutorial	39

ASSESSMENT DETAILS

Description	Marks Out of	Wtg(%)	Required	Due Date
LABORATORY REPORTS	999.00	40.00	Y	04 Mar 2002 (see note 1)
TUTORIAL PROBLEMS	999.00	0.00	Y	04 Mar 2002 (see note 2)
3 HR RESTRICTED EXAM	999.00	60.00	Y	END S1 (see note 3)

NOTES:

1. Examiner to advise due dates for the Laboratory Reports
2. Examiner to advise details for the Tutorial Problems
3. Examination dates will be available during the Semester. Please refer to the examination timetable when published.

OTHER REQUIREMENTS

- 1 Attendance Requirements It is the students' responsibility to actively participate in all classes 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 to Satisfactorily Complete Each Assessment Item To ensure that students can satisfy the objectives of the practical component of the course, students must attend at least 80% of the practical classes, including submission of the assessment items and obtain at least half of the marks available for each item submitted. To satisfactorily complete the examinations in the course, students must obtain at least half of the marks available for each examination.
- 3 Minimum Requirements to Pass the Course To be assured of a pass in this unit, students must: obtain an overall mark of at least 50%; obtain at least 50% of the marks available in the examination(s); obtain an overall mark of at least 50% in the other assessments.
- 4 Grading Final grades for students will be determined by the addition of the marks obtained in each assessment item, weighted as in the Assessment Details and by considering the students' level of achievement of the objectives of the course.
- 5 Supplementary and Deferred Examinations Students who obtain an overall passing mark, but who do not perform satisfactorily in an examination, may, at the discretion of the examiner, be granted a supplementary examination. Students will be granted a deferred examination only if they perform satisfactorily in all other assessment items. Any supplementary or deferred examinations for this course will be held during the examination period at the end of the semester of the next offering of this course.
- 6 Assignments The due date for assignments is the date by which a student must despatch an assignment to the USQ. The onus is on the students 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 48 hours if required by the Examiner. In accordance with University's Policy on Assignments

(Regulation 5.6.1), the Examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances. This policy may be found in the USQ Handbook, the Distance Education Study Guide and the Faculty of Sciences' Orientation Handbook for new on-campus students. All students are advised to study and follow the guidelines associated with this policy. An assignment submitted after the due date without an extension approved by the Examiner, will attract a penalty of 20 percent of the assigned mark for each day (or part thereof) that the assignment is late.

- 7 Examinations Candidates should be aware that the University has policies and regulations (Regulation 5.6.2.2.) about the use of unfair means and electronic devices in an examination and they should refer to them to determine whether or not actions they intend to take are acceptable to the University. Restricted Examination: Candidates will be allowed access only to specific materials in a restricted examination. The only materials that students may use in the restricted examination for this course are: (a) writing materials (non-electronic and free from materials which could give the student an unfair advantage in the examination. (b) 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). With the approval of the Examiner, candidates may take an appropriate non-electronic translation dictionary into the examination. This will be subject to perusal and may be removed from the candidate's possession until appropriate disciplinary action is completed if found to contain material that could give the candidate an unfair advantage. A list of the materials candidates may access in the restricted examination will be on the frontispiece of the examination paper.
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