



The University of Southern Queensland

## Course Specification

### Description: Physics and Instrumentation

Subject	Cat-Nbr	Class	Term	Mode	Units	Campus
PHY	1911	25376	2, 2003	ONC	1.00	TWMBBA

<b>Academic Group:</b>	FOSCI
<b>Academic Org:</b>	FOS002
<b>HECS Band:</b>	2
<b>ASCED Code:</b>	010301

### STAFFING

Examiner: Brad Carter  
Moderator: Jeff Sabburg

### RATIONALE

Physics, the study of the laws of nature, provides engineers and technologists with a thorough understanding of the principles behind instrumentation and its use in measurement and other applications. Physics is a fundamental science relevant to many areas of technology in use today and the principles learned will remain relevant, despite future developments in technology. This course provides comprehensive instruction in physics for students intending to become engineering professionals. The programme content follows the guidelines established by the Institution of Engineers, Australia.

### SYNOPSIS

Physics is the study of natural laws and its basic principles are directly relevant to many areas of science and technology. This introductory course provides students with an understanding of the theory and application of the laws of physics. Emphasis will be given to the core concepts of physics and how they can be used to solve problems. The major topic areas studied are: Problem Solving; Mechanics, Acoustics, Thermodynamics, Electromagnetism; Circuits; Optics. The course material also features some of the many practical applications of physics and the physical principles at work in instrumentation and measurement systems.

### OBJECTIVES

On successful completion of this course students will be able to:

- demonstrate a basic knowledge of physics principles with emphasis on measurement, vectors, kinematics, forces, work, energy, momentum, rotational mechanics, simple harmonic motion, waves, thermodynamics, electric and magnetic fields, electric circuits and geometric optics.

- demonstrate skills and knowledge in the physical principles relevant to instrumentation and measurement systems.

## TOPICS

Description	Weighting (%)
1. Problem Solving in Physics Vectors Kinematics Forces Work and Energy Linear Momentum Rotational Mechanics	50.00
2. Simple Harmonic Motion and Waves Wave Behaviour Thermodynamics The Electric Field The Magnetic Field Electric Circuits Geometric Optics Note: The application of physics to instrumentation forms an integral part of the study of the topics listed above.	50.00

### 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.

Serway, R.A., and Faugh, J.S. 2000, *College Physics: Saunders Core Concepts in College Physics (CD-ROM 3 discs)*, Saunders College Publishing, Fort Worth.

Serway, R.A. and Faugh, J.S. 2000, *College Physics (Technology)*, 5th edition, Saunders College Publishing, Fort Worth.

Serway, R.A. and Faugh, J.S. 2000, *College Physics: Workbook to accompany Saunders core concepts in college physics*, Saunders College Publishing, Fort Worth.

### 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.

Giancoli, D.C. 1998, *Physics - Principles with Applications*, 5th edition, Prentice Hall, Upper Saddle River.

Halliday, D., Resnick, R. & Walker, J. 1997, *Fundamentals of Physics*, 5th edition, Jacaranda Wiley, New York.

Wilson, J.D. & Buffa, A.J. 1997, *College Physics*, 3rd edition, Prentice-Hall, Upper Saddle River.

## STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Assessment	20
Directed Study	64
Examinations	3
Lectures	24
Private Study	48
Tutorial	12

## ASSESSMENT DETAILS

Description	Marks Out of	Wtg(%)	Required	Due Date
ASSIGNMENT 1	20.00	20.00	Y	22 Jul 2003 (see note )
ASSIGNMENT 2	20.00	20.00	Y	22 Jul 2003 (see note )
3HR RESTRICTED EXAM	60.00	60.00	Y	END S2 (see note )

### NOTES:

- . Examiner to advise due date for Assignment 1.
- . Examiner to advise due date for Assignment 2.
- . Examination dates will be available during the Semester. Please refer to the 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, 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 each assessment item. To complete the examination satisfactorily, students must obtain at least 50% of the marks available for the examination.
- 3 Penalties for late submission of required work:  
If students submit assignments after the due date without prior approval then a penalty of up to 20% of the total marks gained by the student 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 receiving a passing grade a student must submit all of the summative assessment items, achieve at least 50% in the examination and at least 50% of the available weighted marks for the 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. With the Examiner's approval, candidates may, take an appropriate non- electronic translation dictionary (but not technical dictionaries) 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**

- 9 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. If requested by the Examiner, students will be required to provide a copy of assignments submitted for assessment purposes. Such copies should be despatched to USQ within 24 hours of receipt of a request being made. 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.