



The University of Southern Queensland

## Course specification

### Description: Physics and Instrumentation

| Subject | Cat-nbr | Class | Term    | Mode | Units | Campus    |
|---------|---------|-------|---------|------|-------|-----------|
| PHY     | 1911    | 54896 | 2, 2006 | ONC  | 1.00  | Toowoomba |

|                                   |        |
|-----------------------------------|--------|
| <b>Academic group:</b>            | FOSCI  |
| <b>Academic org:</b>              | FOS002 |
| <b>Student contribution band:</b> | 2      |
| <b>ASCED code:</b>                | 010301 |

### STAFFING

Examiner: Brad Carter  
Moderator: Jeff Sabburg

### OTHER-REQUISITES

Recommended prior study: PHY1104 and MAT1102

### RATIONALE

Physics is a fundamental part of many areas of science, engineering and technology. Physical principles, once learned, remain relevant despite technological change. This course provides instruction in physics for students of science, engineering and technology, emphasising the practical value and application of physics, including its role in instrumentation and measurement. The course provides an understanding of basic physical principles and problem-solving skills in applied physics. This calculus-based course builds on concepts introduced in PHY1104 Physics Concepts and prepares students for second level Physics studies.

### SYNOPSIS

Physics is the science dealing with natural laws and processes. Its universal principles are fundamental to science, engineering and technology. The principles remain useful despite technological change, and sometimes underpin major advances in technology. This course provides instruction in physics, emphasising the practical role of applied physics. Key physical concepts are discussed and examples given of how physics is of practical benefit, including the role of physics in instrumentation and measurement. The course content includes discussion of topics in the following areas of physics: mechanics, thermodynamics, electromagnetism, optics and modern physics. This calculus-based course builds on concepts introduced in PHY1104 Physics Concepts and prepares students for second level Physics studies.

### OBJECTIVES

On completion of this course students will be able to demonstrate a basic understanding of:

1. Mechanics;
2. Thermodynamics;

3. Waves & Optics;
4. Electricity & Magnetism;
5. Relativity & Quantum Physics

## TOPICS

|    | Description                  | Weighting (%) |
|----|------------------------------|---------------|
| 1. | Mechanics                    | 20.00         |
| 2. | Thermodynamics               | 20.00         |
| 3. | Waves & Optics               | 20.00         |
| 4. | Electricity & Magnetism      | 20.00         |
| 5. | Relativity & Quantum Physics | 20.00         |

## 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).

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

Knight, RD 2004, *Physics for scientists and engineers (with modern physics): a strategic approach (international edition)*, Addison Wesley/Pearson Education, Australia, ISBN 0-321-24329-3.

(with Mastering Physics online access [www.aw\\_bc.com/knight](http://www.aw_bc.com/knight), [www.masteringphysics.com](http://www.masteringphysics.com), [www.pearsoned.com.au](http://www.pearsoned.com.au))

## 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.

If a later edition of these books is available, you are welcome to use it instead of the edition listed below.

To see the latest list of recommended books and online resources, please view the online USQ Study Desk for this course accessible via USQConnect at <http://usqconnect.usq.edu.au> or go directly to the PHY1911 course website: [www.usq.edu.au/users/carterb/phy1911](http://www.usq.edu.au/users/carterb/phy1911)

Halliday, D, Resnick, R & Walker, J 2005, *Fundamentals of physics (extended version)*, 7th edn, John Wiley & Sons, Hoboken, NJ ISBN: 0-471-21643-7.

Tipler, PA & Mosca, G 2003, *Physics for scientists and engineers (extended version)*, 5th edn, WH Freeman and Co, New York (ISBN: 0-7167-4389-2).

## STUDENT WORKLOAD REQUIREMENTS

| ACTIVITY      | HOURS |
|---------------|-------|
| Assignments   | 40.00 |
| Examinations  | 3.00  |
| Lectures      | 24.00 |
| Private Study | 82.00 |
| Tutorials     | 24.00 |

## ASSESSMENT DETAILS

| Description                       | Marks out of | Wtg(%) | Due date               |
|-----------------------------------|--------------|--------|------------------------|
| ASSIGNMENT 1 - CMA                | 10.00        | 10.00  | 01 Sep 2006            |
| ASSIGNMENT 2 - CMA                | 10.00        | 10.00  | 20 Oct 2006            |
| 3HR RESTRICTED EXAM PT A<br>(M/C) | 40.00        | 40.00  | END S2<br>(see note 1) |
| PTB OF ABOVE 3HR RES EXAM         | 40.00        | 40.00  | END S2                 |

### NOTES

1. 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 satisfactorily complete an assessment item a student must achieve at least 50% of the marks or a grade of at least C-. Students do not have to satisfactorily complete each assessment item to be awarded a passing grade in this course. Refer to Statement 4 below for the requirements 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 prior approval then a penalty of 10% of the total marks available 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 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:

Candidates are allowed access only to specific materials during a Restricted 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).

- 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**

- 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.
- 10 In accordance with University Policy, the Examiner may grant an extension of the due date of an assignment in extenuating circumstances.
- 11 The Faculty will NOT accept submission of assignments by facsimile.
- 12 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.
- 13 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.
- 14 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).
- 15 Students may be required to provide a copy of assignments submitted for assessment purposes. Such copies should be dispatched to the USQ within 24 hours of receipt of a request to do so.

### **OTHER REQUIREMENTS**

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