



The University of Southern Queensland

## Course Specification

### Description: Optical Physics

Subject	Cat-Nbr	Class	Term	Mode	Units	Campus
PHY	2202	14411	2, 2002	ONC	1.00	TWMBA

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

### STAFFING

Examiner: Jeff Sabburg

Moderator: Brad Carter

### PRE-REQUISITES

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

### RATIONALE

Scientists working in many areas depend on imaging systems for their basic data, and optical phenomena have, in recent years, formed some of the foundation stones of new industries. This course examines basic optical phenomena as part of the wider discipline of physics.

### SYNOPSIS

Geometrical Optics reflection, refraction, lenses, mirrors, aberrations, lens design and optical systems. Wave Optics interference, coherence, diffraction, light scattering, polarization and application of lasers.

### OBJECTIVES

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

- describe quantitatively the phenomena of reflection and refraction;
- carry out calculations using the basic lens and mirror equations and describe aberrations;
- carry out the calculations for the design of simple lens systems;
- explain a range of optical systems and carry out quantitative evaluations of them;
- explain the phenomena of diffraction, interference, and coherence and carry out a range of calculations involving them;
- explain quantitatively Fourier optics and the phenomena of polarization and scattering of light;

- describe, and explain the operation of, a range of optical applications.

## TOPICS

Description	Weighting (%)
1. Geometrical Optics	50.00
2. Wave Optics	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.

Hecht, E. 2002, *Optics*, 4th edition, Addison Wesley, Reading.

## 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.

Hecht, E. & Zajac, A. 1974, *Optics*, Addison Wesley, Reading.

Meyer-Arendt, J.R. 1995, *Introduction to Classical and Modern Optics*, 4th edition, Prentice Hall, New Jersey, USA.

## STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Examinations	3
Laboratory or Practical Classes	20
Private Study	91
Report Writing	20
Tutorial	36

## ASSESSMENT DETAILS

Description	Marks Out of	Wtg(%)	Required	Due Date
LABORATORY REPORTS	100.00	20.00	Y	22 Jul 2002 (see note 1)
PHOTOGRAPHY ASSIGNMENT	100.00	20.00	Y	22 Jul 2002 (see note 2)
3HR RESTRICTED EXAM	100.00	60.00	Y	END S2 (see note 3)

**NOTES:**

1. Examiner will advise due dates for Laboratory Reports
2. Examiner will advise of due date for Photography Assignment
3. Examination dates will be available during the Semester. Please refer to the Examination Timetable when published.

**OTHER REQUIREMENTS**

- 1 Attendance It is the students' responsibility to participate actively in all classes scheduled for them, and to study 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 Complete Satisfactorily Each Assessment Item To complete satisfactorily the photography assignment students must obtain at least half of the marks available for it. To complete satisfactorily the laboratory component of the course, students must submit all laboratory reports and obtain at least half of the marks available for each report submitted. They must attend at least 80% of the practical classes. To complete satisfactorily the examination 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 course, students must: obtain at least 50% of the marks available for each assessment item; obtain at least 50% of the marks available in the examination and obtain an overall mark of at least 50% in the assignments.
- 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.
- 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 examination for this course will be held at the end of the semester 2, 2002 exam period.
- 6 Assignments The due date for assessments is the date by which a student must despatch it to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner. All laboratory reports are due at the beginning of the next practical session to which the student has been assigned. A 10% penalty will apply up to 5pm of the due date. 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 the 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 Student 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 10% 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 are allowed access only to specific materials in 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 that hold textual (programmable) information are allowed during this 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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