



The University of Southern Queensland

Course Specification

Description: Optical Physics

Subject	Cat-Nbr	Class	Term	Mode	Units	Campus
PHY	2202	24412	2, 2003	ONC	1.00	TWMBA

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

STAFFING

Examiner: Jeff Sabburg

Moderator: Brad Carter

PRE-REQUISITES

Pre-requisite: MAT1100 or MAT1102 and PHY1103

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.
- demonstrate skills and knowledge required to perform laboratory experiments safely with appropriate equipment.

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.

2003, *Laboratory and Tutorial Manual for Optical Physics PHY2202*, University of Southern Queensland, Toowoomba.

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.

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

Pedrotti, F. and Pedrotti, L. 1993, *Introduction to Optics*, 2nd edition, Prentice Hall, New Jersey, USA.

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Examinations	3
Laboratory or Practical Classes	20
Lectures	26
Private Study	88
Report Writing	20
Tutorial	13

ASSESSMENT DETAILS

Description	Marks Out of	Wtg(%)	Required	Due Date
LABORATORY REPORTS	100.00	20.00	Y	22 Jul 2003 (see note)
PHOTOGRAPHY ASSIGNMENT	100.00	20.00	Y	22 Jul 2003 (see note)
3HR RESTRICTED EXAM	100.00	60.00	Y	END S2 (see note)

NOTES:

- . Examiner will advise due dates for Laboratory Reports
- . Examiner will advise of due date for Photography Assignment
- . 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 assignment. To complete the examination satisfactorily, students must obtain at least 50% of the marks available for the examination. To complete the practical component satisfactorily, students must submit 80% of nominated practical reports and obtain at least 50% of the marks available for each report submitted. Students must satisfy Objective 8 by including signed results sheets with their laboratory reports.
- 3 Penalties for late submission of required work:
If students submit assignments/laboratory reports after the due date without prior approval then a penalty of 10% 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 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 In order to attend laboratory classes, students must provide and wear appropriate personal protective equipment. This shall include a laboratory coat, closed in shoes, and safety glasses. Such equipment must be approved by supervising staff. Failure to provide and wear the appropriate safety equipment will result in students being excluded from classes.
- 10 The due date for an assignment/laboratory report 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.