



The University of Southern Queensland

Course specification

Description: Advanced Topics in Physics						
Subject	Cat-nbr	Class	Term	Mode	Units	Campus
PHY	3302	54292	2, 2006	ONC	1.00	Toowoomba

Academic group:	FOSCI
Academic org:	FOS002
Student contribution band:	2
ASCED code:	010301

STAFFING

Examiner: Jeff Sabburg

Moderator: Brad Carter

REQUISITES

Pre-requisite: PHY2201 or (PHY2205 and MAT1102)

OTHER-REQUISITES

Recommended prior study: CSC2409

RATIONALE

This course provides students with an in-depth study of selected topics in Physics. This course is of interest to students of physics, mathematics, climatology, engineering and science education.

SYNOPSIS

The topics to be covered are Cloud Physics and UV Radiation Physics. Each topic builds on some of the material in previous courses and provides examples of in-depth applications. Cloud Physics will discuss cloud monitoring and influence of Clouds on UV. The UV radiation section will include topics on solar UV, Spectroradiometry, broad band metres and UV dosimetry. A series of compulsory practical exercises for a topic are undertaken to demonstrate the principles involved.

OBJECTIVES

On completion of this course students will be able to:

1. demonstrate a sound understanding of and solve problems on the physics of solar UV interactions with the atmosphere;
2. apply some of the principles and techniques of physics to the collection, processing and interpretation of solar UV and atmospheric data;
3. apply radiometric, dosimetric and spectroradiometric techniques for ultraviolet radiation measurements;

4. understand the physical processes and carry out quantitative evaluations of diffuse and scattered solar UV;
5. understand and quantify principles of atmospheric physics;
6. describe, and explain the influence of clouds on solar UV.

TOPICS

	Description	Weighting (%)
1.	Solar UV radiation physics, Interaction with the atmosphere, Physics of UV monitoring.	25.00
2.	Diffuse and scattered solar UV, Atmospheric scattering.	25.00
3.	Atmospheric environment, UV index, Ozone, Cloud physics, Thermodynamics of the atmosphere.	25.00
4.	Cloud monitoring, Influence of Clouds on solar UV, UV Enhancement by Cloud	25.00

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).

MATLAB Software (Student Edition).

Parisi, AV, Sabburg, JS and Kimlin, MG 2004, *Scattered and filtered Solar UV Measurements*, Kluwer Academic Publishers,

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.

, , *Journal of the Atmospheric Sciences*,

Houghton, JT 2002, *The Physics of Atmospheres*, 3rd edn, Cambridge University Press, Cambridge.

McElroy, MB 2002, *The Atmospheric Environment: effect of human activity*, Princeton University Press,

Rogers, RR & Yau, MK 1989, *A Short Course in Cloud Physics*, 3rd edn, Pergamon Press,

Tsonis, AA 2003, *An Introduction to Atmospheric Thermodynamics*, Cambridge University Press, New York.

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Examinations	3.00
Lectures or Laboratory Classes	36.00
Private Study	103.00
Report Writing	30.00

ASSESSMENT DETAILS

Description	Marks out of	Wtg(%)	Due date
LABORATORY REPORTS	15.00	15.00	25 Jul 2006 (see note 1)
ASSIGNMENT	15.00	15.00	25 Jul 2006 (see note 2)
3 HR RESTRICTED EXAMINATION	70.00	70.00	END S2 (see note 3)

NOTES

1. Due dates for laboratory reports will be advised early in the semester.
2. Due date for assignment will be advised early in the semester.
3. 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 the practical component satisfactorily, students must achieve at least 50% in the practical reports (using their own results) and obtain at least 50% of the marks available for each report submitted.
- 3 Penalties for late submission of required work:
If students submit assignments after the due date without prior approval then a penalty of 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 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/corporateservices/calendar/part5.htm> or in 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 closed in shoes. 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 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. The examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances.