



The University of Southern Queensland

Course specification

The current and official versions of the course specifications are available on the web at <http://www.usq.edu.au/coursespecification/current>.
Please consult the web for updates that may occur during the year.

Description: Physics of Climate

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
CLI	2110	86557	1, 2009	EXT	1.00	Toowoomba

Academic group:	FOSCI
Academic org:	FOS002
Student contribution band:	6
ASCED code:	010701

STAFFING

Examiner: Joachim Ribbe
Moderator: Andrew Le Brocque

REQUISITES

Pre-requisite: (CLI1110 or PHY1102) and MAT2100

RATIONALE

Students undertaking climatological studies need a sound basis of the science of the climate system, its compositions, and its physical properties. The course is designed to provide the student with an understanding of the climate machine.

SYNOPSIS

The course describes the physical processes underlying the behaviour of the atmosphere and ocean, and the way the atmosphere and ocean interact. Topics covered include the physical laws involved in climate, weather, atmospheric and oceanic stability and instability, synoptic-scale processes, energy in the climate system, and the hydrological cycle. Access to the internet is required.

OBJECTIVES

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

1. demonstrate an understanding of and describe the basic physical principles and processes underlying atmospheric processes, weather systems and climate (Exercises 1-10, Exam).

TOPICS

Description	Weighting (%)
1. Physical laws involved in weather and climate: equations of state, thermodynamics, hydrostatic, conservation of mass.	20.00

2.	Atmospheric stability and instability: lapse rates, inversions, aerological diagram.	20.00
3.	Synoptic-scale processes: convergence, divergence, vorticity, thickness.	20.00
4.	Energy in the Atmosphere and Ocean: radiation balance, radiation laws, solar radiation, terrestrial radiation, radiation balance, evaporation, energy balances.	20.00
5.	The Water Cycle: Humidity: vapour pressure, dewpoint, mixing ratios; Clouds: condensation, types of clouds, nucleation, electricity; Rainfall: processes, intensity, variability, surface runoff.	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).

Barry, RG & Chorley, RJ 2003, *Atmosphere, Weather and Climate*, 8th edn, Routledge, London.

McGregor, GM & Nieuwolt, S 1998, *Tropical Climatology*, 2nd edn, John Wiley & Sons, New York.

Sturman, AP & Tapper, NJ 2005, *The Weather and Climate of Australia and New Zealand*, 2nd edn, Oxford University Press, Melbourne.

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.

Hartmann, D 1994, *Global Physical Climatology*, Academic Press,

Karoly, DJ & Vincent, DG 1998, *Meteorology of the Southern Hemisphere*, American Meteorological Society, Boston.

Linacre, E & Hobbs, J 1977, *The Australian Climatic Environment*, Wiley, Brisbane.

Siedler, CG, Church, J & Gould, J 2001, *Ocean Circulation and Climate: observing and modelling the global ocean*, Academic Press, San Diego.

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Directed Study	52.00
Examinations	2.00
Private Study	115.00

ASSESSMENT DETAILS

Description	Marks out of	Wtg (%)	Due date
EXERCISES 1-5	100.00	20.00	03 Apr 2009
EXERCISES 6-10	100.00	20.00	29 May 2009
2 HR RESTRICTED EXAM	100.00	60.00	END S1 (see note 1)

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. 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 of the examiner then a penalty of 5% of the total marks gained by the student for the assignment will apply for each working day late up to ten working days at which time a mark of zero will be recorded.
- 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 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; Students whose first language is not English, may, take an appropriate unmarked non-electronic translation dictionary (but not technical dictionary) into the examination. Dictionaries with any handwritten notes will not be permitted. Translation dictionaries 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.

- 7 Examination period when Deferred/Supplementary examinations will be held:
Any Deferred or Supplementary examinations for this course will be held during the next examination period.
- 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 Students will be granted a deferred examination only if they perform satisfactorily in all other assessment items.
- 10 The due date for assessments is the date by which a student must despatch an 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. this must be produced within 48 hours if required by the Examiner.