GEOPHYS 331 Physics of the Atmosphere and Ocean 2015

Offered:	Semester 1
Credit:	15 points
Pre-/Co-requisites:	PHYS 230 or 231, and one of PHYS 211, MATHS 253, ENGSCI 211. PHYS 213 is recommended preparation.

Description

This course introduces the physical processes important to the atmosphere and ocean. It includes fluid dynamics common to the atmosphere and ocean, thermodynamics of the atmosphere and ocean; cloud physics, sea-ice formation, atmospheric radiation, and climate physics.

Aims

Provides the essential introduction to the physics of climate, weather and remote sensing.

Skills and knowledge to be gained

Students who pass this course should be able to:

- describe and explain the basic features of the structure of the atmosphere and ocean
- explain the basic flow of energy through the climate system
- explain the physical processes essential to cloud formation
- explain the physical processes essential to the precipitation
- explain the physical processes essential to the formation of sea-ice
- explain the basic flow of radiant energy in the atmosphere
- explain how the Coriolis force affects the fluid dynamics of the atmosphere and ocean

Syllabus

Thermodynamics of the atmosphere; basic energy and hydrology cycles of the climate system; cloud and precipitation physics, sea-ice physics; atmospheric radiative transfer; equilibrium climate physics; elements of remote sensing; equations of fluid motion; Coriolis force; Ekman spirals; jet streams; Rossby waves.

Learning activities and teaching methods

Description	Study time
Lectures 36 X 1 hour	36 hours
In-class tests x 2	-
Assignments X 4	8 hours
Field Trip X 1	8 hours
Private study (3 hours/lecture)	108 hours (recommended)

Inclusive learning
Students are urged to discuss privately any impairment-related requirements face-to-face and/or in written form with the course convenor/lecturer and/or tutor.

Assessment

Form	Weight	Time	When
Assignments	20% (4 × 5%)	2 hours per assignment	weeks 2, 4, 8, 10
Tests	20% (2 x 10%)		weeks 6, 11
Field Trip (mandatory)	10%	1 day	28 March 21015
Exam	50%	3 hours	exam period

Academic Integrity
The University of Auckland will not tolerate cheating, or assisting others to cheat, and views cheating in coursework as a serious academic offence. The work that a student submits for grading must be the student's own work, reflecting his or her learning. Where work from other sources is used, it must be properly acknowledged and referenced. This requirement also applies to sources on the world-wide web. A student's assessed work may be reviewed against electronic source material using computerised detection mechanisms. Upon reasonable request, students may be required to provide an electronic version of their work for computerised review. Please visit the below link for further information:
https://www.auckland.ac.nz/en/about/learning-and-teaching/policies-guidelines-and-procedures/academic-integrity-info-for-students.html

Resources

Recommended reading:

"*An Introduction to Atmospheric Physics*," 2nd Ed., D.G. Andrews, Cambridge, 2010.
"*Elementary Climate Physics*," F.W. Taylor, Oxford 2005;
"*Seawater: its composition, properties and behaviour*," 2nd Ed., The Open University, Butterworth-Heineman, 1995.
"*Thermodynamics of the Atmosphere and Ocean*," J. Curry & P. Webster, Academic Press, 1999

Feedback

Marked script and model solutions to assignments; Review of test questions; marked exam script (if requested)

Enrolment

Typical enrolment Semester 1: 15