ATOC30004 Dynamical Meteorology and Oceanography

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2012, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus. Lectures and practical classes.
Time Commitment:	Contact Hours: 2 x one hour lectures per week; 1 x two hour practical class per week Total Time Commitment: Estimated total time commitment of 120 hours
Prerequisites:	

Subject	Study Period Commencement:	Credit Points:
ATOC20002 Atmospheric Environment Processes	Semester 2	12.50

Plus one of

620-143 Applied Mathematics (prior to 2009).

Subject	Study Period Commencement:	Credit Points:
MAST10006 Calculus 2	Semester 1, Semester 2	12.50
MAST10009 Accelerated Mathematics 2	Semester 2	12.50

Corequisites:	None
Recommended Background Knowledge:	At least one of # 620-296 Multivariable and Vector Calculus (prior to 2010) # 620-231 Vector Analysis (prior to 2009) # 620-233 Vector Analysis Advanced (prior to 2010) # 620-232 Mathematical Methods (prior to 2010) # 620-234 Mathematical Methods Advanced (prior to 2009)

Subject	Study Period Commencement:	Credit Points:
MAST20009 Vector Calculus	Semester 1, Semester 2	12.50
MAST20019 Dynamical Systems and Chaos	Semester 2	12.50

Non Allowed Subjects:	Students may only gain credit for one of: 625-331 Atmosphere-Ocean Interaction (prior to 2009); or

Subject	Study Period Commencement:	Credit Points:
ATOC30004 Dynamical Meteorology and Oceanography	Semester 1	12.50

Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry. The University is dedicated to provide support to those with special requirements. Further details on

	the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
Coordinator:	Dr Alexandre Pezza
Contact:	**Email: apezza@unimelb.edu.au (mailto:apezza@unimelb.edu.au)**
Subject Overview:	This subject addresses the fundamental processes that govern atmospheric and oceanic motion, and how these processes interact to control the weather and climate of the Earth. Topics include the fluid dynamics of the atmosphere and ocean, the scaling of the equations of motion, the shallow-water system, vorticity and divergence, buoyancy driven flows, and numerical modelling of atmospheric and oceanic flows.On completion of this subject, students should have an appreciation of the fundamental processes that govern atmospheric and oceanic motion and interactions on a range of time and spatial scales. A qualitative as well as quantitative understanding of the atmosphere is to be gained, with the substantial mathematical analyses covered during the subject. Students will also receive experience in constructing simplified models of the atmosphere and ocean.
Objectives:	This subject builds on the skills obtained in the first and second year subjects in atmospheric and oceanic sciences, and presents a quantitative treatment of atmospheric and oceanic dynamics. On completion of this subject students should have an understanding of the physical processes that govern atmospheric and oceanic motions on a range of time and spatial scales, and appreciate how these processes form the basis of atmospheric and oceanic models.
Assessment:	Four practical assignments not exceeding 2000 words in total (two worth 12.5%, two worth 7.5%); a 2-hour written examination in the examination period (60%). The assignments will be set at approximately equal intervals throughout the semester.
Prescribed Texts:	None
Recommended Texts:	An Introduction to Dynamic Meteorology by J.R. Holton and Atmospheric and Oceanic Fluid Dynamics by G. K. Vallis (students are not required to purchase these books)
Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Arts (https://handbook.unimelb.edu.au/view/2012/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2012/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2012/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2012/B-MUS)** You should visit **learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html)** and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	The subject builds on the skills obtained in the first and second year subjects in atmospheric and oceanic sciences. A focus of the subject is to enhance your ability to think critically of the importance of physical processes occurring in the atmosphere and ocean. The course will challenge you to see these media as an integrated whole, and extend your understanding of complex physical systems. It will also lead you to be able to carefully interpret the meaning and value of various types of data, and use computational techniques to further your understanding of the atmosphere / ocean system. In the subject there is continuous assessment through the semester to allow you to be conscious of the level of new skills and understandings that you are gaining. Efficient management of your time is an important factor influencing your level of performance in these assessments and the final exam. It is important that you supplement the material in lectures and practical with your own exploration of the topics covered.
Notes:	This subject is available for science credit to students enrolled in the BSc (both pre-2008 and new degrees), BASc or a combined BSc course.

Related Majors/Minors/ Specialisations:	Atmosphere and Ocean Science Science credit subjects* for pre-2008 BSc, BASc and combined degree science courses Science-credited subjects - new generation B-SCI and B-ENG. Core selective subjects for B-BMED.