ATOC90006 Climate Analysis and Modelling

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	This subject is not offered in 2016.
Time Commitment:	Contact Hours: 40 hours comprising two weeks of workshop-style lecture and practical activities 10.00am - 4.00pm daily, with breaks as appropriate to conduct. Total Time Commitment: 170 hours
Prerequisites:	The subjects below, or equivalent (can be taken concurrently).

Subject	Study Period Commencement:	Credit Points:
ATOC30004 Dynamical Meteorology and Oceanography	Semester 1	12.50
ATOC30006 Modern and Future Climate	Semester 2	12.50

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Contact:	**kevin.walsh@unimelb.edu.au (mailto:kevin.walsh@unimelb.edu.au)**
Subject Overview:	The course introduces students to the philosophy and techniques of the quantitative analysis of weather and climate data, and modelling the large-scale atmospheric system. Among the topics to be covered are the maintenance of the general circulation of the atmosphere, a discussion of the global energy balance and momentum balance, and the role of baroclinic eddies and the meridional circulation. The subject will also cover the growth of error in numerical models and its implications for predictability and climate simulation, as well as an introduction to the structure of General Circulation Models (GCMs) and an appraisal of their simulations of climate. Other parts will include an examination of the philosophy of the design and implementation of climate sensitivity experiments with GCMs. Also covered will be an introduction to the statistical foundations for the analysis of observed and simulated data (including spectral methods, Principal Component Analysis, Monte-Carlo testing, non-parametric tests, trend analysis, the t-test). Other topics to be covered will include the climatology of ozone and the ozone hole, and the mechanics and variability of the ‘semi-annual oscillation’ and the ‘southern annular mode’ and the relevance of these to climate change.
Learning Outcomes:	The objectives of this subject are to provide students with: # up to date knowledge of current research topics in climate analysis and modelling; # experience in critical synthesis and assessment of the current literature; # an appreciation of the strengths and limitations of different approaches to modelling complex data.

Assessment:	Written assignments totalling 3,000 words (70%) and a 15 minute presentation (30%). Assessment is due within six weeks of the completion of intensive lecture modules.
Prescribed Texts:	None
Recommended Texts:	None
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	On completion of this subject students will have gained experience in: # developing the ability to exercise critical judgement; # rigorous and independent thinking; # adopting a problem-solving approach to complex or ambiguous questions; # high-level written report presentation skills; # oral communication and presentation skills.
Related Course(s):	Master of Science (Earth Sciences)
Related Majors/Minors/ Specialisations:	Earth Sciences Earth Sciences Honours Program - Earth Sciences