ATOC30005 Global Climates of the Past

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2010, Parkville This subject commences in the following study period/s: March, Parkville - Taught on campus. Lecture 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:	One of # **625-104 Understanding Planet Earth (/view/2010/625-104)** # 625-104 The Earth, Atmosphere and Oceans (prior to 2010) # 625-103 The Atmosphere and Oceans (prior to 2008) Plus # **625-227 Weather and Climate Systems (/view/2010/625-227)** (may be taken concurrently) Plus one of # **620-155 Calculus 2 (/view/2010/620-155)** # **620-158 Accelerated Mathematics 2 (/view/2010/620-158)** # 620-143 Applied Mathematics (prior to 2009)
Corequisites:	None
Recommended Background Knowledge:	At least one of # **620-231 Vector Calculus (/view/2010/620-231)** # **620-299 Dynamical Systems and Chaos (/view/2010/620-299)** # 620-296 Multivariable and Vector Calculus (prior to 2010) # 620-231 Vector Analyis (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)
Non Allowed Subjects:	Students may only gain credit for one of # 625-335 Global Climates of the Past # 625-332 Climate: Mechanisms and Variability (prior to 2009)
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.
Coordinator:	Prof Ian Simmonds
Contact:	**Email: simmonds@unimelb.edu.au (mailto:simmonds@unimelb.edu.au)**

Subject Overview:	The main area of study in this subject is the broad description of climates from the past treated in a global context. Emphasis will be placed on the physical processes responsible for those climates and their variability. The topics to be covered in the subject include a broad geological-scale view of climate. Factors which influence climate, including external and geological factors, land - ice - ocean - atmosphere interactions, and stochastic effects. Energy balance models and 'snowball' earth. Development and decay of Ice Ages, and the role of Antarctica and the northern latitude continents. The global thermohaline circulation. Sea level variations, and the hydrological cycle. The use of paleoclimate data proxies, including foraminifera, fossils, tree rings, isotopes and the theoretical underpinnings of these. The associations between carbon dioxide and climate change.
Objectives:	The objectives of this subject are to present a comprehensive picture of how global climates have changed in the past and to explore the mechanisms responsible for those changes. It also has the objective of exploring how climate maintenance is influenced by specific issues such as greenhouse gases, ocean circulation, and the presence of Antarctica.
Assessment:	Literature survey (1000 words) (20%) and two practicals (both 3%) and two problem sets (both 7%) during semester (not exceeding 1000 words in total); a 2-hour written examination in the examination period (60%). The literature survey will be set in the first half of semester and due at the end of semester. The practicals and problem sets will be set at approximately equal intervals during semester.
Prescribed Texts:	None
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/2010/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2010/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2010/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2010/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:	On completion of this subject students should have developed the following generic skills: An ability to comprehend the workings of complex systems and the workings and connectedness of the climate system as a whole.
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 Course(s):	Bachelor of Science
Related Majors/Minors/ Specialisations:	Atmosphere and Ocean Science Atmosphere and Ocean Sciences Physical (Environmental Engineering) Systems