436-466 Renewable Energy

Credit Points:	12.50
Level:	4 (Undergraduate)
Dates & Locations:	This subject is not offered in 2009. On campus only
Time Commitment:	Contact Hours: Thirty-two hours of lectures and 16 hours of practice classes Total Time Commitment: 120 hours
Prerequisites:	436-351 Thermofluids 2 or equivalent
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
Subject Overview:	Topics covered include a selection from nature and availability of wind energy; wind turbines, classification, construction and control; performance evaluation methods; power, efficiency, reliability and cost; load matching; nature and availability of solar radiation; radiation estimations and measuring instruments; materials for solar energy utilisation, radiative properties and thermal transport properties; introduction to non-concentrating collectors, design techniques and performance estimation; solar component and solar system operational characteristics; practical applications of solar energy, special solar devices for developing countries; and desalination, photovoltaics and solar water pumping.
Objectives:	Upon completion students should understand the distribution and variability of the wind as an energy source, and the limitations of wind energy devices in harnessing this energy; and have developed a comprehension of wind turbine design parameters and skill in performance estimation and component design for a range of applications. Students should also understand the distribution of solar energy and the limitations that this places on the performance of solar energy systems; and comprehend the importance of materials and losses in the systems performance and have knowledge and skill in solar systems selection and design methods.
Assessment:	One 3-hour examination (60%) and practical work not exceeding 20 pages including computations, diagrams, tables and computer output. Each student will make a 10 minute oral presentation on the subject of his or her practical work near the end of the semester (40%).
Prescribed Texts:	None
Recommended Texts:	Information Not Available
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:	# ability to apply knowledge of basic science and engineering fundamentals # ability to communicate effectively, not only with engineers but also with the community at large

	# ability to undertake problem identification, formulation and solution # ability to utilise a systems approach to design and operational performance # ability to function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member # understanding of the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development # understanding of the principles of sustainable design and development # understanding of professional and ethical responsibilities and commitment to them # expectation of the need to undertake lifelong learning, capacity to do so # capacity for independent critical thought, rational inquiry and self-directed learning # intellectual curiosity and creativity, including understanding of the philosophical and methodological bases of research activity # openness to new ideas and unconventional critiques of received wisdom # profound respect for truth and intellectual integrity, and for the ethics of scholarship # international awareness and openness to the world, based on understanding and appreciation of social and cultural diversity and respect for individual human rights and dignity
Notes:	Not available in 2009. Contact the Department of Mechanical Enigneering for information about future availability.