421-825 Energy from Biomass and Wastes

Credit Points:	12.500
Level:	Graduate/Postgraduate
Dates & Locations:	This subject is not offered in 2008.
Time Commitment:	Contact Hours: 24 hours lectures and 12 hours set tasks; Non-contact time commitment: 84 hours Total Time Commitment: Not available
Prerequisites:	None
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
Coordinator:	Lu Aye
Subject Overview:	Available biomass and waste sources: the transformation of biomass and wastes into useful energy forms. Solid fuels: mechanisms of combustion, design of combustion equipment, pretreatment techniques, pollution concerns. Wood: plantations: species selection, harvesting and usage. Agricultural wastes: harvesting, storage and use. Pyrolysis and gasification: fundamentals, equipment design and operation, gas cleaning, wood carbonisation, charcoal production and use. Liquid fuels: characteristics and properties. Ethanol: production from sugar, starch and cellulose-based feed stocks, fermentation fundamentals, recovery and purification. Vegetable oils as diesel substitutes. Octane enhancers. Gaseous fuels: producer gas, biogas. Anaerobic digestion; fundamentals, design and operation of large and small-scale digesters, use of biogas and landfill gas. Non-technical concerns: energetics of energy production from wastes and crops, economics, waste minimisation as an energy source equivalent, cultural, religious, political and administrative problems affecting the widespread introduction and use of waste and biomass-derived energy forms.
Assessment:	One assignment of up to 2,000 words (40%), a 2-hour examination (40%) and set tasks (20%).
Prescribed 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 successful completion, students will have an: # understanding of the prospects for producing useful energy from a wide variety of waste and biomass materials, with particular reference to the problems of developing countries # understanding of the fundamentals of important pre-treatment and processing steps in energy production from wastes and biomass, including densification, pyrolysis, gasification, combustion, fermentation and anaerobic digestion; knowledge of past and current technology in important areas of biomass or wastes-based energy production, including those relating to charcoal, ethanol, gasifiers and waste combustion

	# appreciation of the technical and non-technical problems that limit the application and use of biomass-based and waste-based energy systems
Related Course(s):	Master of Energy Studies Master of Engineering Project Management Master of Engineering Structures Master of Environmental Engineering Master of Utilities Management Master of Water Resource Management