MCEN90015 Thermodynamics

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	This subject is not offered in 2013.
Time Commitment:	Contact Hours: 36 hours of lectures, 12 hours of tutorials and 4 hours of laboratory work. Total Time Commitment: 120 hours
Prerequisites:	

Subject	Study Period Commencement:	Credit Points:
ENGR30001 Fluid Mechanics & Thermodynamics	Not offered 2013	12.50

AND either

Subject	Study Period Commencement:	Credit Points:
MAST20029 Engineering Mathematics	Not offered 2013	12.50

OR both of the following subjects

Subject	Study Period Commencement:	Credit Points:
MAST20009 Vector Calculus	Not offered 2013	12.50
MAST20030 Differential Equations	Not offered 2013	12.50

MAST20030 Differential Equations may be taken concurrently.

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	MCEN30004 Thermofluids 2 MCEN30005 Thermofluids 3
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/
Contact:	mjbrear@unimelb.edu.au
Subject Overview:	There are 3 related, major topics of study in this subject. Each of these topics will analyse aspects of important thermodynamic devices and will then be integrated to analyse their combined effects in selected devices. # Heat transfer: conduction, convection, radiation and heat exchangers # Mass transfer and psychrometry: diffusive and convective mass transfer, solubility, evaporation, thermodynamics of air/water mixtures, heat transfer analogies # Cycle analysis: gas turbines, refrigeration and steam cycles, spark ignition and diesel engines, integration of heat and mass transfer phenomena into cycle analysis
Objectives:	At the conclusion of this subject students should be able to -

	# Apply the fundamental principles of thermodynamics, heat and mass transfer to numerous engineering devices # Quantify and analyse the performance of various devices in which energy and mass transfer occur # Use a systems approach to simplify a complex problem
Assessment:	Two assignments or laboratory reports of equal weight and not exceeding 1500 words each due during semester (30% total), one 3-hour end of semester examination (70%) .
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:	# Ability to apply knowledge of science and engineering fundamentals # Ability to undertake problem identification, formulation, and solution # Understanding of social, cultural, global, and environmental responsibilities and the need to employ principles of sustainable development # Ability to utilise a systems approach to complex problems and to design and operational performance # Capacity for creativity and innovation
Related Course(s):	Bachelor of Engineering (Biomedical) Biomechanics
Related Majors/Minors/ Specialisations:	B-ENG Mechanical Engineering stream Master of Engineering (Mechanical) Master of Engineering (Mechatronics)