436-351 Thermofluids 2

Credit Points:	12.500
Level:	Undergraduate
Dates & Locations:	2008, This subject commences in the following study period/s: Semester 1, - Taught on campus.
Time Commitment:	Contact Hours: Unit 1: Twenty hours of lectures, four hours of tutorials and laboratory work. Unit 2: Sixteen hours of lectures, eight hours of tutorials and laboratory work Total Time Commitment: Not available
Prerequisites:	436-201 Thermofluids 1 and 431-101 Engineering Analysis A and 431-102 Engineering Analysis B; or 620-231 Vector Analysis and 620-232 Math Methods and 620331 Applied PDE's)
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:	Dr.A.Ooi
Subject Overview:	Unit 1, Fluid Dynamics: On completion of this unit students should be able to analyse inviscid flow of an incompressible fluid for simple boundary conditions and know where the concepts are applicable in practice; appreciate the application of Laplace's equation to a number of phenomena including fluid flow; be able to use complex velocity potential analysis to solve a variety of inviscid flow problems including incompressible flow past airfoils; and know the basic characteristics of pumps and fans and their classification and how to match these with operating systems. Topics covered include basic introduction to inviscid flow with and without vorticity; concepts and analysis using stream function and velocity potential; incompressible viscous flow past bodies with vortex shedding; and basic equations of pumps and fans and their classification and characteristics. Unit 2, Thermodynamics: On completion of this unit students should have an understanding of the fundamentals of heat transfer under steady and unsteady conditions; appreciate the application of Laplace's equation to heat conduction; understand the principles of thermodynamic plant design including heat and mass transfer; and have a working knowledge of heat exchangers and regenerators. Topics covered include thermal conduction in steady and unsteady conditions; convection, Reynolds analogy and dimensional analysis; free and forced convection; radiation heat transfer; heat and mass transfer, boiling and condensation; and heat exchangers and regenerators, heat exchanger applications.
Assessment:	One 3-hour end-of-semester examination. Tutorial tests and assignments to be submitted throughout the semester. Unit 1 Fluid Mechanics: Examination 35%; laboratory 5% and assignments not exceeding 30 pages or equivalent 15%. Unit 2 Thermodynamics: Examination 35%, one assignment not exceeding 15 pages 5%, laboratory oral examination (15 minutes) 5%.

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 # in-depth technical competence in at least one engineering discipline # 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 principles of sustainable design and development # 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
Related Course(s):	Bachelor of Engineering (Biomedical) Biomechanics Bachelor of Engineering (EngineeringManagement)Mechanical&Manufacturing Bachelor of Engineering (Mechanical &Manufacturing) and Bachelor of Arts Bachelor of Engineering (Mechanical &Manufacturing)& Bachelor of Science Bachelor of Engineering (Mechanical &Manufacturing)/Bachelor of Commerce Bachelor of Engineering (Mechanical and Manufacturing Engineering) Bachelor of Engineering (Mechatronics) and Bachelor of Computer Science Bachelor of Engineering(Mechanical & Manufacturing) and Bachelor of Laws