411-204 Chemical Engineering Thermodynamics

Credit Points:	12.500
Level:	Undergraduate
Dates & Locations:	2008, This subject commences in the following study period/s: Semester 2, - Taught on campus.
Time Commitment:	Contact Hours: Forty-eight hours Total Time Commitment: Not available
Prerequisites:	610-141 and 610-142 Chemistry and 100-level Mathematics
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:	Assoc prof D Shallcross
Subject Overview:	Review of the First Law and the Second Law of Thermodynamics, definition of terms associated with these laws, primary thermodynamic functions (P, V, T, U and S) and the Maxwell relations, auxiliary thermodynamic functions (H, G and A), P-V-T diagrams of pure substances, ideal gas and departure from ideality, equations of state and state functions. Calculations of thermodynamic properties and thermodynamic charts, application of thermodynamics to flow processes, vapour and gas power cycles, compressors and turbines, refrigeration and gas liquefaction. Partial molar quantities, chemical potential and activity coefficient. Gas mixtures and liquid mixtures, dilute solution. Solubility of a gas in a liquid and a solid in a liquid. The phase rule, phase equilibria in one component systems, two component systems. Chemical reaction equilibria, stoichiometric number, reaction coordinate. Effect of temperature and pressures on equilibrium constant, evaluation of equilibrium constant, relationship between equilibrium constant and composition. Graphical representation of standard free energy change. Ellingham diagrams. Non-standard conditions. Thermodynamics of Interfaces.
Assessment:	A mid-semester test worth 20% held in or about Week 6 and end of semester examination worth 80%.
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

	# in-depth technical competence in at least one engineering discipline # ability to undertake problem identification, formulation and solution # ability to identify incorrect conclusions and procedures through application of Thermodynamic principles # ability to predict state functions and variables such as temperature and pressure in chemical engineering substances
Related Course(s):	Bachelor of Engineering (Chemical Engineering) Bachelor of Engineering (Chemical and Biomolecular Engineering) Bachelor of Engineering (Chemical) and Bachelor of Arts Bachelor of Engineering (Chemical) and Bachelor of Commerce Bachelor of Engineering (Chemical) and Bachelor of Laws Bachelor of Engineering (Chemical) and Bachelor of Science Bachelor of Engineering (EngineeringManagement) Chemical Bachelor of Engineering(Biochemical Engineering)and Bachelor of Science