436-354 Mechanics 3

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus.
Time Commitment:	Contact Hours: Unit 1: Eighteen hours of lectures and six hours of tutorials and laboratory. Unit 2: Thirteen hours of lectures and 11 hours of tutorials and laboratory Total Time Commitment: Not available
Prerequisites:	**436-353** Mechanics 2 and (200-level mathematics - **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 Peter Vee Sin Lee
Subject Overview:	Unit 1, Stress Analysis: Upon completion of this unit, students should be able to model a variety of mechanical engineering structures as a number of elementary components and stress analyse each component to determine failure loads and deflections of the complete structure. Topics covered include engineering plasticity, design of pressure vessels and pipes, thick-walled cylinders, shrink fitting, duplex pressure vessels, inelastic deformation, residual stresses, membrane theory of shells of revolution, yielding, rotating shells, local bending stresses, stress analysis of rotating discs with and without holes, shrink fitting, initial and ultimate yielding, fracture mechanics and fatigue, and introduction to the finite element method. Unit 2, Dynamics of Mechanical Systems: Upon completion, students should be able to formulate physical and mathematical models for three-dimensional dynamic analysis of mechanical systems, solve the mathematical models by means of analytical and numerical methods and assess stability of their Âsolutions. Topics covered include constraints, mobility, generalised coordinates, number of degrees of freedom, driving forces, virtual displacement, generalised force, impressed forces and constraint forces, principle of virtual work, Lagrange equations of motion, kinetic energy function, potential energy function, collisions of unconstrained and constrained bodies, and analysis of mathematical models.
Objectives:	-
Assessment:	One 3-hour examination at the end of semester (80%). Unit 1: assignment of up to 1000 words (10%). Unit 2: assignment of up to 1000 words (5%) and 2 laboratory reports (5%) due throughout the semester.
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 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 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 # profound respect for truth and intellectual integrity, and for the ethics of scholarship
Related Course(s):	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