MCEN90037 Advanced Dynamics

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	This subject is not offered in 2015.
Time Commitment:	Contact Hours: 36 hours of lectures and 12 hours of tutorials Total Time Commitment: 200 hours
Prerequisites:	

Subject	Study Period Commencement:	Credit Points:
MCEN90009 Dynamics of Machines	Semester 2	12.50

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
Contact:	**simon.illingworth@unimelb.edu.au (mailto:simon.illingworth@unimelb.edu.au)**
Subject Overview:	**AIMS** This course provides a general introduction to vibration modelling, analysis and control. **INDICATIVE CONTENT** The topics covered are: # Single degree of freedom systems (mass-spring-damper systems); free vibration, response to harmonic forcing, response to general forcing # Multiple degree of freedom systems; free vibration of 2 DoF systems, natural frequencies and odeshapes, response to forcing, matrix methods for multi DoF systems # Continuous systems - free vibration of tring, bars, beams and shafts, equations of motion , boundary conditions, natural frequencies and modeshapes, forced vibration # Modelling methods - Rayleigh's method and Lagrange's method # Vibration control - demping, vibration isolation, vibration absorbers # Experimental methods - modal analysis # Nonlinear vibrations.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** Upon completion students should be able to: 1 Formulate mathematical models for vibration analysis for single degree of freedom systems; multiple degree of freedom systems and continuous systems 2 Analyse these systems using a variety of analysis tools both in the time domain and in the frequency domain 3 Apply methods for the control of vibrations 4 Apply some more advanced topics in vibrations, including experimental methods and nonlinear vibrations.

Assessment:	One written mid-semester test not exceeding two hours (10%). Two assignments due in weeks 6 and 10 (15% each), requiring approximately 20 hours work each. End of semester exam not exceeding 3 hours (60%). Hurdle requirement - Students must pass the exam component to pass the subject.
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
Related Majors/Minors/ Specialisations:	Master of Engineering (Mechanical)