MCEN90041 Advanced Dynamics

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 36 x 1 hour lectures and 12 hours of workshops Total Time Commitment: Estimated 200 hours
Prerequisites:	One of the following subjects:

Subject	Study Period Commencement:	Credit Points:
MCEN90038 Dynamics	Semester 1	12.5
MCEN90009 Dynamics of Machines	Semester 2	12.5
MCEN30016 Mechanical Dynamics	Semester 1	12.5

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	

Subject	Study Period Commencement:	Credit Points:
MCEN90037 Advanced Dynamics	Not offered 2016	12.5

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 Denny Oetomo
Contact:	Dr Denny Oetomo Email: doetomo@unimelb.edu.au
Subject Overview:	This subject continues from Dynamics to deepen the students' understanding of Engineering Mechanics, specifically focusing on *Analytical Mechanics*: # Kinematics and Generalised Coordinates # Virtual Work and Virtual Displacement, Generalised Force # Energies: Kinetic, Potential # Lagrange approach: dealing with constraints # Lagrange's Approach to obtaining equation of motion # Comparison to Newton-Euler Approach # Hamiltonian Mechanics

	# Linearisation of system dynamics about equilibrium points (system stability about equilibrium points.
Learning Outcomes:	Intended Learning Outcomes (ILOs) Having completed this unit the student is expected to be able to: 1 Independently formulate physical and mathematical models for three-dimensional dynamic analysis of mechanical systems 2 Solve the mathematical models by means of specialised analytical and numerical methods.
Assessment:	One written 3 hour closed book end of semester examination (60%). ILOs 1-2 are addressed in the exam. One mid-semester 1 hour test in week 8 (10%), ILOs 1-2 are addressed in the test. Three written assignments not exceeding 30 pages in total (30-35 hours of work), due in weeks 4, 6, and 11 (30%). ILOs 1-2 are addressed in these assignments.
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:	On completion of the subject students should have the following skills: • Ability to apply knowledge of science and engineering fundamentals • Ability to undertake problem identification, formulation, and solution • Ability to utilise a systems approach to complex problems and to design and operational performance • Ability to communicate effectively, with the engineering team and with the community at large • Capacity for lifelong learning and professional development.
Related Majors/Minors/ Specialisations:	Master of Engineering (Mechanical) Master of Engineering (Mechatronics)