MCEN90028 Automation Systems

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2012, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 36 hours of lectures, 24 hours of tutorials and laboratory work. Total Time Commitment: 120 hours
Prerequisites:	<table><tr><th>Subject</th><th>Study Period Commencement:</th><th>Credit Points:</th></tr><tr><td>ELEN90055 Control Systems</td><td>Semester 1</td><td>12.50</td></tr></table> Plus one of the following - <table><tr><th>Subject</th><th>Study Period Commencement:</th><th>Credit Points:</th></tr><tr><td>MCEN90024 Mechatronics Design</td><td>Semester 2</td><td>12.50</td></tr><tr><td>MCEN30014 Mechanical Design</td><td>Semester 2</td><td>12.50</td></tr><tr><td>ELEN90053 Electronic System Design</td><td>Semester 2</td><td>12.50</td></tr></table>
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 Denny Oetomo
Contact:	**doetomo@unimelb.edu.au (mailto:doetomo@unimelb.edu.au)**
Subject Overview:	# Robotics and automation (18 hrs of lectures and 12 hours of tutorials and practical work) - robotic manipulators - kinematics including inverse and differential kinematics, dynamics including Denavitg-Hartenberg convention, loagrangian approach and classical Newton-Euler formulation, position, force and velocity control, trajectory planning, robotic vision and robotic programming. # Machine tools (9 hrs of lectures and 6 hrs of tutorials and practical work) - planning, scheduling and control of machine tool systems, modelling and prediction of product and process quality performance. # Factory automation networks (9 hrs of lectures and 6 hrs of tutorials and practical work) - concepts for the automated factory environment with networked stations, use of Ethernet, wireless technology and protocols, safety and security issues.
Objectives:	On completion of this subject, students should be able to -

	# Analyse and simulate the dynamic performance of robotic manipulators and machine tools # Undertake a systems analysis for a practical automation system # Specify software and hardware requirements # Integrate software, hardware and human components of an automation system # Make effective use of the relevant research literature
Assessment:	One 2 hour written examation (40%) at the end of semester; four group and individual projects, assignments and lab reports of equal weight (not exceedng 2500 words each), in weeks 4, 6, 8 and 10 (60%).
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 complation of this subject students should have the following skills - # Critical thinking and critical judgement of assumptions adopted # Abstract mathematical reasoning # Interpretation and analysis of data # Application of theory to practice # Ability to utilise a systems approach to design and operational performance # Ability to apply knowledge of basic science and engineering fundamentals # Ability to undertake problem identification, formulation and solution # Able to clearly communicate the process and outcomes of a technical investigation
Related Majors/Minors/ Specialisations:	Master of Engineering (Mechanical) Master of Engineering (Mechatronics)