MCEN90017 Advanced Motion Control

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 36 hours lectures, 36 hours of tutorials and workshops. Total Time Commitment: 200 hours
Prerequisites:	<table><tr><th>Subject</th><th>Study Period Commencement:</th><th>Credit Points:</th></tr><tr><td>ELEN90064 Advanced Control Systems</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 Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry.The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability
Contact:	A/Prof Chris Manzie **manziec@unimelb.edu.au (mailto:manziec@unimelb.edu.au)**
Subject Overview:	**AIMS** This subject is intended to give students an overview of the present state-of-the-art in industrial motion control and the likely future trends in control design. Students will be exposed to and have practical experience in the design and implementation of advanced controllers for various motion control problems. Advanced modelling and control topics will include system identification, modelling and compensation of friction and other disturbances, industrial servo loops, model-based and model-free controller design, and adaptive control. Applications will be drawn from industrial, medical and transport automation (eg robots, machine tools, production machines, laboratory automation, automotive and aerospace by-wire systems). **INDICATIVE CONTENT** Advanced modelling and control topics will include system identification, modelling and compensation of friction and other disturbances, industrial servo loops, model-based and model-free controller design, and adaptive control. Applications will be drawn from industrial, medical and transport automation (eg robots, machine tools, production machines, laboratory automation, automotive and aerospace by-wire systems).
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** Upon completion of this subject, students should be able to - 1 Apply control theory in complex automated systems drawn from industrial, medical and transport automation 2 Design and implement advanced control systems using state-of-the-art development tools.

Assessment:	Three assignments of up to 5000 words each due in weeks 4, 8 and 12 of the semester, approximately 15 to 20 hours of work each (50% total), assesses ILOs 1 and 2. One 2-hour end of semester examination (50%). Assesses ILOs 1 and 2.
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:	# 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 solutions # Ability to use a systems approach to design and operational performance # Capacity for independent critical thought, rational inquiry and self-directed learning # Openness to new ideas and unconventional critiques of received wisdom # 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 # Ability to communicate effectively with the engineering team and with the community at large.
Notes:	**INDICATIVE CONTENT** Advanced modelling and control topics will include system identification, modelling and compensation of friction and other disturbances, industrial servo loops, model-based and model-free controller design, and adaptive control. Applications will be drawn from industrial, medical and transport automation (eg robots, machine tools, production machines, laboratory automation, automotive and aerospace by-wire systems). **INDICATIVE KEY LEARNING RESOURCE** Textbook extracts, journal papers, lecture notes. **CAREERS / INDUSTRY LINKS** Six to eight industry speakers
Related Course(s):	Doctor of Philosophy - Engineering Master of Philosophy - Engineering
Related Majors/Minors/ Specialisations:	Master of Engineering (Mechanical) Master of Engineering (Mechatronics)