ELEN90064 Advanced Control Systems

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2011, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 36 hours of lectures and up to 24 hours of workshops Total Time Commitment: 120 hours
Prerequisites:	prerequist for this subject is **Subject** / **Study Period Commencement:** / **Credit Points:** ELEN90055 Control Systems / Semester 1 / 12.50 (prior to 2011, ELEN30001 Control 1 OR MCEN30008 Control Systems 1)
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Anti-requisite for this subject is : **Subject** / **Study Period Commencement:** / **Credit Points:** ELEN40007 Control 2 (Advanced Control) / Not offered 2011 / 12.50
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/
Coordinator:	Dr Ying Tan
Contact:	Dr. Ying Tan Dr. Chris Manzie Email: **yingt@unimelb.edu.au (mailto:yingt@unimelb.edu.au)** **manziec@unimelb.edu.au (mailto:manziec@unimelb.edu.au)**
Subject Overview:	This subject provides an introduction to modern control theory with a particular focus on state-space techniques and optimal control. Students will study topics including: # MIMO systems, state-space models, Lyapunov stability theory, and linearization; # Kalman decomposition of linear time-invariant state-space models, state feedback and pole placement, output feedback and observer design; and # Linear quadratic regulators, moving-horizon predictive control with constraints, and dynamic programming. This material is complemented by use of software tools (e.g. MATALB/ Simulink) for computation and simulation.

Objectives:	On completing this subject the student should be able to: # Apply fundamental state-space techniques in the analysis and design of linear feedback control systems, as they arise in a variety of contexts; # Formulate control engineering problems in terms of optimising an objective function subject to constraints; # Use software tools to simulate and design the linear control systems.
Assessment:	One written examination, not exceeding three hours at the end of semester, worth 70%; Continuous assessment of submitted project work, not exceeding 30 pages over the semester, worth 30%.
Prescribed Texts:	TBA
Recommended 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 solution # Ability to utilise 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:	Credit may not be obtained for both ELEN40007(431-464) Control Systems (Advanced) and ELEN90064 Advanced Control Systems
Related Course(s):	Bachelor of Engineering (Biomedical)Biosignals Bachelor of Engineering (Computer Engineering) Bachelor of Engineering (Electrical Engineering) Bachelor of Engineering (Electrical) and Bachelor of Arts Bachelor of Engineering (Electrical) and Bachelor of Commerce Bachelor of Engineering (EngineeringManagement) Electrical Postgraduate Certificate in Engineering
Related Majors/Minors/ Specialisations:	Master of Engineering (Electrical) Master of Engineering (Mechanical) Master of Engineering (Mechatronics)