ELEN90055 Control Systems

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2012, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 3 x one hour lectures and 1 x two hour workshop per week Total Time Commitment: Estimated total time commitment of 120 hours per semester
Prerequisites:	Prerequisite for this subject is:

Subject	Study Period Commencement:	Credit Points:
ELEN30012 Signals and Systems	Semester 2	12.50

OR

Subject	Study Period Commencement:	Credit Points:
MCEN30016 Mechanical Dynamics	Semester 1	12.50

OR

Subject	Study Period Commencement:	Credit Points:
BMEN30006 Fundamentals of Biosignals	Semester 1	12.50

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Anti-requisites for this subject are:

Subject	Study Period Commencement:	Credit Points:
ELEN30001 Control 1 (Classical Control)	Not offered 2012	12.50
MCEN30008 Control Systems 1	Not offered 2012	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:	Assoc Prof Michael Cantoni
Contact:	Assoc Prof Michael Cantoni Email: **cantoni@unimelb.edu.au (mailto:cantoni@unimelb.edu.au)**

Subject Overview:	This subject provides an introduction to automatic control systems with an emphasis on classical (i.e. frequency domain) techniques for the design of feedback compensators for single-input-single-output (SISO) systems. In particular, students will study topics including: # Modelling for control and the structure, stability, performance and robustness of feedback systems; # Frequency-domain design - Nyquist and Bode plots, gain and phase margins, loop-shaping with proportional- integral- lead- and lag-compensators, loop delays, and fundamental limitations in SISO control system design; and # Actuator constraints and anti-windup compensation. This material will be complemented by the use of software tools (e.g. MATLAB/Simulink) for computation and simulation, and exposure to operational control systems in the laboratory.
Objectives:	On completing this subject the student should be able to: # Qualitatively and quantitatively describe the benefits of feedback in engineering systems; # Apply fundamental frequency-domain techniques in the analysis and design of linear feedback control systems, as they arise in a variety of contexts; # Use software tools to simulate and design the linear behaviour of automatic control systems.
Assessment:	One written examination, not exceeding three hours at the end of semester, worth 70% (must pass written exam to pass subject); Continuous assessment of submitted project work, not exceeding 20 pages over the semester, worth 20%;andA one-hour mid-semester test, worth 10%
Prescribed Texts:	TBA
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 # Ability to communicate effectively, with the engineering team and with the community at large
Notes:	Credit may not be obtained for both: # ELEN30001(431-324)Control1(classical control)and ELEN90055 Control Systems # MCEN30008 Control Systems1 and ELEN90055 Control Systems
Related Course(s):	Bachelor of Engineering (Biomedical) Biomechanics
Related Majors/Minors/ Specialisations:	B-ENG Electrical Engineering stream B-ENG Mechanical Engineering stream Master of Engineering (Biomedical) Master of Engineering (Electrical) Master of Engineering (Mechanical) Master of Engineering (Mechatronics)