ENGR 3006 CONTROL SYSTEMS

Credit Points 10

Legacy Code 300009

Coordinator Upul Gunawardana (https://directory.westernsydney.edu.au/search/name/Upul Gunawardana/)

Description This subject introduces the fundamental concepts of automatic control engineering. It covers traditional and contemporary design and analysis techniques; the concepts required to design continuous time and discrete time controllers. Matlab is utlilized considerably.

School Eng, Design & Built Env

Discipline Other Engineering And Related Technologies

Student Contribution Band HECS Band 2 10cp

Check your fees via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 3 subject

Pre-requisite(s) ELEC 2011 OR
MECH 3004

Assumed Knowledge

200238 - Mathematics for Engineers 2
• Ordinary Differential Equations
• First order, Second order, and Higher order.
• Laplace transforms
• Multivariable Calculus
• Functions of two or more variables
• Double integrals
• Triple integrals.
Similar to that contained in 200238 - Mathematics for Engineers 2. Students should also have the appropriate background and competence in the safe use of computers, test equipment, components and data sheets.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Apply the meaning of open and closed loop configurations to control systems.
2. Formulate and analyse models of real systems using physical characteristics.
3. Evaluate the performance of control system configurations in the time domain.
4. Analyse block diagrams and signal flow graph models.
5. Apply complex frequency concepts to the s-plane in the context of damping, damped frequency and stability.
6. Apply root locus methods for design of controllers.
7. Identify the issues associated with the use of digital controllers such as the computer.

Subject Content

Continuous and discrete time modelling
Notion of negative feedback, error and error reduction
Transfer functions, block diagrams, signal flow graphs, state variable methods
Time domain responses and stability analysis
Bode diagrams, root locus, Nyquist stability
Introduction to digital control concepts

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task	Mandatory
Quiz	3 x 2 hour online quizzes	30	N	Individual	Y
Practical	2 hours on alternate weeks	20	N	Individual	Y
Final Exam	2 hours	50	N	Individual	Y

Teaching Periods

Sydney City Campus - Term 2 (2025)

Sydney City

On-site

Subject Contact Ehsan Gatavi (https://directory.westernsydney.edu.au/search/name/Ehsan Gatavi/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ENGR3006_25-SC2_SC_1#subjects)

Spring (2025)

Penrith (Kingswood)

Hybrid

Subject Contact Upul Gunawardana (https://directory.westernsydney.edu.au/search/name/Upul Gunawardana/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ENGR3006_25-SPR_KW_3#subjects)

Parramatta City - Macquarie St

Hybrid

Subject Contact Upul Gunawardana (https://directory.westernsydney.edu.au/search/name/Upul Gunawardana/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ENGR3006_25-SPR_PC_3#subjects)