COURSE OUTLINE

ELC205 Control Systems

School: School of Science, Technology and Engineering

2026 | Semester 2

UniSC Moreton Bay

BLENDED LEARNING

Most of your course is on campus but you may be able to do some components of this course online.

Please go to unisc.edu.au for up to date information on the teaching sessions and campuses where this course is usually offered.

1. What is this course about?

1.1. Description

Control systems are used to attain increased productivity and better performance of a system. In this course, you gain an understanding of the expediency and application of control systems engineering. You will be introduced to the fundamental elements of control theory and its application in industrial control systems. You will use this knowledge of mathematical theories to develop advanced methods to design, model and analyze control theories and apply your modeling and analysis skills to design and solve the problem of control systems.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Asynchronous learning material	1hr	Week 1	13 times
Tutorial/Workshop 1 – On Campus workshop	2hrs	Week 2	10 times
Laboratory 1 – On campus labs	2hrs	Week 3	5 times
Seminar – On campus seminar	1hr	Week 1	Once Only

1.3. Course Topics

- Control theory
- Open and closed loop control
- System modelling (Laplace transforms)
- PID control
- Root locus and Bode plots
- Design for steady state and stability
- Linear feedback systems and feedforward systems
- Advanced topics in control systems

2. What level is this course?

200 Level (Developing)

Building on and expanding the scope of introductory knowledge and skills, developing breadth or depth and applying knowledge and skills in a new context. May require pre-requisites where discipline specific introductory knowledge or skills is necessary. Normally, undertaken in the second or third full-time year of an undergraduate programs.

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES On successful completion of this course, you should be able to...	GRADUATE QUALITIES MAPPING Completing these tasks successfully will contribute to you becoming...	PROFESSIONAL STANDARD MAPPING * Engineers Australia Stage 1 Professional Engineer Competency Standards
1 Recognise and formulate system models and control system characteristics	Knowledgeable	1.2, 1.3
2 Use control system theories and understanding to identify and analyse dynamic system behaviour	Creative and critical thinker	2.1, 2.3
3 Apply knowledge and skills to design, implement and evaluate feedback control loops.	Empowered	2.2
4 Professionally communicate the investigation, analysis and interpretation of experimental data in continuous and discrete-time systems.	Engaged	3.2, 3.3
5 Work collaboratively in teams to design control system to meet specified requirements.	Empowered	3.6

* Competencies by Professional Body

CODE	COMPETENCY
ENGINEERS AUSTRALIA STAGE 1 PROFESSIONAL ENGINEER COMPETENCY STANDARDS	
1.2	Knowledge and Skill Base: Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.
1.3	Knowledge and Skill Base: In-depth understanding of specialist bodies of knowledge within the engineering discipline.
2.1	Engineering Application Ability: Application of established engineering methods to complex engineering problem solving.
2.2	Engineering Application Ability: Fluent application of engineering techniques, tools and resources.
2.3	Engineering Application Ability: Application of systematic engineering synthesis and design processes.
3.2	Professional and Personal Attributes: Effective oral and written communication in professional and lay domains.
3.3	Professional and Personal Attributes: Creative, innovative and pro-active demeanour.
3.6	Professional and Personal Attributes: Effective team membership and team leadership.

5. Am I eligible to enrol in this course?

Refer to the UniSC Glossary of terms for definitions of “pre-requisites, co-requisites and anti-requisites”.

5.1. Pre-requisites

MTH201 and enrolled in Program SC404, SC405, SC410, SC411, SC425, AB101

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

Not applicable

5.4. Specific assumed prior knowledge and skills (where applicable)

Not applicable

5.5. Microcredential Information

Not applicable

6. How am I going to be assessed?

6.1. Grading Scale

Standard Grading (GRD)

High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL).

6.2. Details of early feedback on progress

Performance and feedback from the workshop tasks will demonstrate the level of proficiency and understanding of the course material.

6.3. Assessment tasks

DELIVERY MODE	TASK NO.	ASSESSMENT PRODUCT	INDIVIDUAL OR GROUP	WEIGHTING %	WHAT IS THE DURATION / LENGTH?	WHEN SHOULD I SUBMIT?	WHERE SHOULD I SUBMIT IT?
All	1	Portfolio	Group	20%	400 words equivalent each 4 x 5% each	Throughout teaching period (refer to Format)	Online Submission
All	2	Oral and Written Piece	Group	40%	The project report is to be written with a maximum page limit of 10 pages. Each group will deliver a 10 minutes oral presentation.	Week 11	Online Assignment Submission with plagiarism check
All	3	Examination - Centrally Scheduled	Individual	40%	2 hours	Exam Period	Exam Venue

All - Assessment Task 1: Portfolio

GOAL:	These tasks will build your skills in identifying solutions to practical experiments that use hardware and computer simulation in control systems of simple and intermediate complexity. You'll also expand your skills in using common industrial formats to document your scientific conclusions
PRODUCT:	Portfolio
AUTHORSHIP STATEMENT:	
FORMAT:	Control system-based laboratory works in the form of a 4 reports of 400 words equivalent each including figures, text, and diagrams.
CRITERIA:	

No.		Learning Outcome assessed
1	Recognition and formulation of control system models.	1
2	Utilisation of theories to identify and analyse dynamic system behaviour	2
3	Communication of experimental results continuous and discrete-time systems using appropriate engineering terminology, symbols and diagrams.	4
4	Demonstration of ability to work collaboratively in teams to design control system to meet specified requirements.	5
5	Application of systematic control engineering and design processes within the technology domain	3

GENERIC SKILLS:	

All - Assessment Task 2: Mini Project and presentation

GOAL:	These projects will develop your understanding of important theory and enable you to demonstrate your knowledge and skills in designing controls in electrical and electronics systems of intermediate complexity.
PRODUCT:	Oral and Written Piece
AUTHORSHIP STATEMENT:	
FORMAT:	Project report of 1500 words equivalent and make an oral presentation of approximately 10 minutes.
CRITERIA:	

No.		Learning Outcome assessed
1	Utilisation of theories to identify dynamic system behaviour	2
2	Application of practical skills and knowledge to design, implement and evaluate feedback control loops	3
3	Communication of experimental results and understanding of control system theories in continuous and discrete-time systems using appropriate engineering terminology, symbols and diagrams in different modes of communication.	4
4	Demonstration of ability to work collaboratively in teams to design control system to meet specified requirements.	5

GENERIC SKILLS:	

All - Assessment Task 3: Final Exam

GOAL:	The final exam will develop your ability to independently apply your skills and knowledge to solve familiar problem-based questions with confidence within a set time limit and without access to additional resources.
PRODUCT:	Examination - Centrally Scheduled
AUTHORSHIP STATEMENT:	
FORMAT:	Centrally scheduled 2 hour closed book examination.
CRITERIA:	

No.		Learning Outcome assessed
1	Correct utilisation of control system theories to identify dynamic system behaviour	2
2	Correct application of practical skills and knowledge to design, implement and evaluate feedback control loops	3

GENERIC SKILLS:	

7. Directed study hours

A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Student workload is calculated at 12.5 learning hours per one unit.

8. What resources do I need to undertake this course?

Please note: Course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Canvas site– Please log in as soon as possible.

8.1. Prescribed text(s) or course reader

You need regular access to the resource(s) below. Many texts are available as ebooks through the Library at no additional cost.

REQUIRED?	AUTHOR	YEAR	TITLE	EDITION	PUBLISHER
Required	Norman S. Nise	2017	Control Systems Engineering	8th Edition	Wiley

8.2. Specific requirements

Fully enclosed shoes must be worn in the engineering laboratory. If you do not have the correct shoes you will not be allowed to do the practical. You must also undertake the laboratory induction before you can undertake any practical.

9. How are risks managed in this course?

Health and safety risks for this course have been assessed as low. It is your responsibility to review course material, search online, discuss with lecturers and peers and understand the health and safety risks associated with your specific course of study and to familiarise yourself with the University's general health and safety principles by reviewing the online induction training for students, and following the instructions of the University staff.

10. What administrative information is relevant to this course?

10.1. Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Canvas, are electronically checked through Turnitin. This software allows for text comparisons to be made between your submitted assessment item and all other work to which Turnitin has access.

10.2. Assessment: Additional Requirements

Eligibility for Supplementary Assessment Your eligibility for supplementary assessment in a course is dependent of the following conditions applying: The final mark is in the percentage range 47% to 49.4% The course is graded using the Standard Grading scale You have not failed an assessment task in the course due to academic misconduct.

10.3. Assessment: Submission penalties

Late submission of assessment tasks may be penalised at the following maximum rate: - 5% (of the assessment task's identified value) per day for the first two days from the date identified as the due date for the assessment task. - 10% (of the assessment task's identified value) for the third day - 20% (of the assessment task's identified value) for the fourth day and subsequent days up to and including seven days from the date identified as the due date for the assessment task. - A result of zero is awarded for an assessment task submitted after seven days from the date identified as the due date for the assessment task. Weekdays and weekends are included in the calculation of days late. To request an extension you must contact your course coordinator to negotiate an outcome.

10.4. Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Central Examinations
- Deferred Examinations
- Student Conduct
- Students with a Disability

For more information, visit https://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

10.5. Student Charter

UniSC is committed to excellence in teaching, research and engagement in an environment that is inclusive, inspiring, safe and respectful. The Student Charter sets out what students can expect from the University, and what in turn is expected of students, to achieve these outcomes.

10.6. General Enquiries

In person:

- **UniSC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **UniSC Moreton Bay** - Service Centre, Ground Floor, Foundation Building, Gympie Road, Petrie
- **UniSC SouthBank** - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- **UniSC Gympie** - Student Central, 71 Cartwright Road, Gympie
- **UniSC Fraser Coast** - Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay
- **UniSC Caboolture** - Student Central, Level 1 Building J, Cnr Manley and Tallon Street, Caboolture

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