In Progress

Please note that this Unit Profile is still in progress. The content below is subject to change.

ENEX12003 *Essential Mathematics for Control Systems*

Term 1 - 2023

Profile information current as at 29/04/2024 03:13 am

All details in this unit profile for ENEX12003 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview

In this unit, you will learn the fundamentals of control systems and essential mathematical skills to analyse and design a standard control system. The mathematical knowledge you will gain through this unit includes differentiation, integration, Laplace and Fourier transformations needed to model a control system. You will study linear time-invariant (LTI) systems and mathematical representation of periodic signals, time and S-domain representation of control systems. You will use industry-standard simulation software to model LTI systems, simple control systems and will gain skills in simulating various control schemes using this simulating software.

Details

Career Level: *Undergraduate*
Unit Level: *Level 2*
Credit Points: *6*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites

Prerequisites: Prerequisites: MATH11218 Applied Mathematics AND Electrical Fundamentals for Aircraft Maintenance
Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the Assessment Policy and Procedure (Higher Education Coursework).

Offerings For Term 1 - 2023

No offerings for ENEX12003

Attendance Requirements

All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

Regional Campuses
Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

Metropolitan Campuses
Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Written Assessment**
Weighting: 20%
2. **Written Assessment**
Weighting: 20%
3. **Practical and Written Assessment**
Weighting: 20%
4. **Take Home Exam**
Weighting: 40%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the University's Grades and Results Policy for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the CQUniversity Policy site.
You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the CQUniversity Policy site.

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Interpret the derivative as a rate of change to apply the rules of differentiation in investigating rates of change of functions
2. Apply standard rules and techniques of differentiation and integration to construct and analyse simple mathematical models involving rates of change and elementary differential equations
3. Perform Fourier transforms to find frequency domain representations of time domain functions
4. Explain the principles of automatic control systems and typical associated control system building blocks
5. Apply forward and inverse Laplace transforms and analyse control systems in the s-domain using simulation software
6. Work collaboratively and autonomously and communicate professionally in presenting your solutions.

Learning Outcomes are linked to Engineers Australia Stage 1 Competencies and also discipline capabilities. You can find the mapping for this on the Engineering Undergraduate Course website.

Alignment of Learning Outcomes, Assessment and Graduate Attributes

— N/A Level ◦ Introductory Level • Intermediate Level • Graduate Level ◦ Professional Level ◦ Advanced Level

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - Written Assessment - 20%	•	•				
2 - Written Assessment - 20%			•	•	•	
3 - Practical and Written Assessment - 20%			•		•	•
4 - Take Home Exam - 40%	•	•		•	•	

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
1 - Communication	•	•	•	•		•
2 - Problem Solving	•	•	•	•	•	•
3 - Critical Thinking	•	•	•	•	•	•
4 - Information Literacy						
5 - Team Work						•
6 - Information Technology Competence			•	•	•	

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
7 - Cross Cultural Competence						
8 - Ethical practice						
9 - Social Innovation						
10 - Aboriginal and Torres Strait Islander Cultures						

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Written Assessment - 20%	•	•	•							
2 - Written Assessment - 20%	•	•	•							
3 - Practical and Written Assessment - 20%	•	•	•		•	•				
4 - Take Home Exam - 40%	•	•	•							

Textbooks and Resources

Textbooks

There are no required textbooks.

IT Resources

You will need access to the following IT resources:

Referencing Style

Information for Referencing Style has not been released yet.

This unit profile has not yet been finalised.

Teaching Contacts

Information for Teaching Contacts has not been released yet.

This unit profile has not yet been finalised.

Assessment Tasks

Information for Assessment Tasks has not been released yet.

This unit profile has not yet been finalised.

Academic Integrity Statement

Information for Academic Integrity Statement has not been released yet.

This unit profile has not yet been finalised.