



# ENAE12003 Control Technology

## Term 1 - 2020

Profile information current as at 29/04/2024 05:07 am

All details in this unit profile for ENAE12003 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

This unit will introduce you to control systems. You will describe control systems using appropriate terminology and concepts and use mathematical tools to model and analyse control systems, and develop algorithms for discrete process control. You will interpret control system responses to standard inputs in order to develop system evaluation criteria, as well as interpreting continuous-time closed-loop system behaviour using time domain and frequency response methods. You will design compensators for closed loop systems to meet given specifications and describe different approaches to discrete control using common system components and tools and present practical implementations of the controllers using passive and active circuits and discrete processes. You will document modelling and analysis of control systems in a professional manner, and work productively and professionally, both as an individual and as a member of a team. A compulsory residential school is provided to promote development of unit learning outcomes.

#### 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

Pre-requisite: ENAE12013 Electrical Components and Circuit Analysis

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 - 2020

- Mixed Mode

#### 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).

#### Residential Schools

This unit has a Compulsory Residential School for distance mode students and the details are:

Click here to see your [Residential School Timetable](#).

#### 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: 25%

#### 2. **Written Assessment**

Weighting: 30%

#### 3. **Written Assessment**

Weighting: 25%

#### 4. **Practical and Written Assessment**

Weighting: 20%

#### 5. **Written Assessment**

Weighting: Pass/Fail

### 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](#).

## Previous Student Feedback

### Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

#### Feedback from Unit survey

##### **Feedback**

Students appreciated the Zoom tutorial classes, the residential school and the feedback given on the assessments.

##### **Recommendation**

This good practice will be continued.

#### Feedback from Unit survey

##### **Feedback**

Students appreciated the timely support from lecturer.

##### **Recommendation**

This good practice will be continued.

#### Feedback from Unit survey

##### **Feedback**

Students have requested more questions and solutions to be able to master mathematical processes required for control technology.

##### **Recommendation**

This will be implemented in the next year.

#### Feedback from Unit survey

##### **Feedback**

Students preferred to have the assignment submission deadlines to be moved to the weekend.

##### **Recommendation**

This will be implemented in the next year.

## Unit Learning Outcomes

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

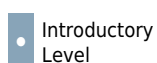
1. Explain terminology, concepts and principles used to describe and analyse control systems.
2. Model and analyse systems comprising several subsystems, using block diagrams and mathematical description.
3. Describe and develop algorithms for discrete process control.
4. Interpret the behaviour pattern of first order and second order systems in response to standard inputs so as to specify criteria for evaluating a control system.
5. Interpret system behaviour using time domain methods to describe a continuous-time closed-loop system.
6. Interpret system behaviour using frequency response methods to describe a continuous-time closed-loop system.
7. Design compensators for closed loop systems to meet given specifications using standard techniques.
8. Describe circuit structures which implement continuous controllers using passive and/or active elements and describe the discrete implementations.
9. Document the process of modelling and analysis of control systems and present the information in a professional manner.
10. Provide evidence of personal reflection on, and critical assessment of, team contributions and professional development.

Learning Outcomes are linked to Engineers Australia Stage 1 Competencies.

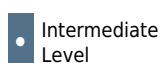
## Alignment of Learning Outcomes, Assessment and Graduate Attributes



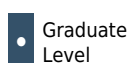
N/A  
Level



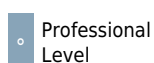
Introductory  
Level



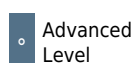
Intermediate  
Level



Graduate  
Level



Professional  
Level



Advanced  
Level

## Alignment of Assessment Tasks to Learning Outcomes

[illegible]

## Alignment of Graduate Attributes to Learning Outcomes

[illegible]

## Alignment of Assessment Tasks to Graduate Attributes

[illegible]

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
<b>5 - Written Assessment - 0%</b>	•	•	•	•	•	•		•		

## Textbooks and Resources

### Textbooks

ENAE12003

#### Prescribed

#### Control Systems Engineering

Edition: 8th edn (2019)

Authors: Norman S. Nise

John Wiley & Sons

Milton , QLD , Australia

Binding: Hardcover

ENAE12003

#### Supplementary

#### Matlab/SIMULINK Software

Edition: R2019a (R2019a)

Mathworks

Binding: Other

#### Additional Textbook Information

Copies of the textbook can be purchased from the CQUni Bookshop here: <http://bookshop.cqu.edu.au> (search on the Unit code)

Software will be supplied.

[View textbooks at the CQUniversity Bookshop](#)

### IT Resources

**You will need access to the following IT resources:**

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

## Referencing Style

All submissions for this unit must use the referencing style: [Harvard \(author-date\)](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**Sanath Alahakoon** Unit Coordinator

[s.alahakoon@cqu.edu.au](mailto:s.alahakoon@cqu.edu.au)

## Schedule

### Week 1 - 09 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
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Overview of control systems	Chapter 1: Introduction Week 1 Study Guide
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#### Week 2 - 16 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Representation of control systems	Chapter 2: Modeling in the Frequency Domain Chapter 5: Reduction of Multiple Subsystems Week 2, 3 Study Guide	

#### Week 3 - 23 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Representation of control systems	Chapter 2: Modeling in the Frequency Domain Chapter 5: Reduction of Multiple Subsystems Week 2, 3 Study Guide	

#### Week 4 - 30 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Poles, zeros and the system response	Chapter 4: Time Response Chapter 7: Steady-State Errors Week 4, 5 Study Guide	

#### Week 5 - 06 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Poles, zeros and the system response	Chapter 4: Time Response Chapter 7: Steady-State Errors Week 4, 5 Study Guide	Residential school of the unit will be held in Rockhampton B28/2.10 from 06th to 08th April 2020 starting at 9.00 am.  <b>Assignment 1</b> Due: Week 5 Monday (6 Apr 2020) 11:59 pm AEST

#### Vacation Week - 13 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
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#### Week 6 - 20 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
PID Control	Week 6 Study Guide	

#### Week 7 - 27 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Overview of Digital Control	13: Digital Control Systems Week 7 Study Guide	

#### Week 8 - 04 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
Programmable Logic Controllers	Week 8 Study Guide	

#### Week 9 - 11 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
Root Locus Based Controller Design	Chapter 8: Root Locus Techniques Chapter 9: Design Via Root Locus Week 9, 10 Study Guide	<b>Assignment 2</b> Due: Week 9 Monday (11 May 2020) 9:00 am AEST

#### Week 10 - 18 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
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Root Locus Based Controller Design  
Chapter 8: Root Locus Techniques  
Chapter 9: Design Via Root Locus  
Week 9, 10 Study Guide

### Week 11 - 25 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
Frequency Response Based Controller Design	Chapter 10: Frequency Response Techniques Chapter 11: Design Via Frequency Response Week 11, 12 Study Guide	<b>Residential School and Lab Report</b> Due: Week 11 Monday (25 May 2020) 9:00 am AEST

### Week 12 - 01 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic
Frequency Response Based Controller Design	Chapter 10: Frequency Response Techniques Chapter 11: Design Via Frequency Response Week 11, 12 Study Guide	

### Review/Exam Week - 08 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic
Final Submission Week		<b>Assignment 3</b> Due: Review/Exam Week Monday (8 June 2020) 9:00 am AEST

### Exam Week - 15 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic
		<b>Workbook</b> Due: Exam Week Monday (15 June 2020) 9:00 am AEST

## Term Specific Information

Students will require to use Matlab/SIMULINK for some of the assignments. Matlab/SIMULINK will be available in all student computers in the computing facilities within the university campuses. Any student wanting to use Matlab/SIMULINK off site on their personnel computers will have to purchase a student licence. The following components are strongly recommended for students purchasing student licenses:

#### **Basic package and toolboxes**

Matlab  
Simulink  
Communication System toolbox  
Control System toolbox  
DSP System toolbox  
Optimization toolbox  
Signal Processing toolbox  
Symbolic Math toolbox  
Simulink Control Design toolbox  
SimScape toolbox  
SimScape Power Systems toolbox

## Assessment Tasks

### 1 Assignment 1

#### **Assessment Type**

Written Assessment

#### **Task Description**

In this compulsory assessment item, students are expected to successfully complete the exercises specified in the course website in Moodle covering the learning outcomes 1, 2, and 9. This assignment contains 6-8 problems which will

require the theoretical knowledge gained through your learning during the first three weeks. Marking scheme for each question will be published with the assignment and the marks for this assignment will contribute to 25% of the overall marks of this course. Assignment questions will be published in course Moodle site within the first two weeks of the term. Please also refer to assessment criteria for more details.

**Assessment Due Date**

Week 5 Monday (6 Apr 2020) 11:59 pm AEST

Please upload to the link provided in course website in Moodle as a WORD or PDF file

**Return Date to Students**

Week 7 Monday (27 Apr 2020)

Feedback given through course website in Moodle

**Weighting**

25%

**Minimum mark or grade**

Minimum mark or grade - Students must score more than 50% of the allocated marks for this assignment

**Assessment Criteria**

**Each question in this assignment will be assessed separately for the criterion accuracy and correct results and given a mark from zero to 10 marks. 20% of the total marks for this assignment are based on accuracy and**

**correct results, including:**

- Correct application of maths and arithmetic
- Answers clearly identified
- Correct results

**In addition, the assignment as a whole will be assessed against the following criteria:**

**Evidence of correct procedures (40% of the total marks for the assignment)**

- All necessary steps in analysis are present on correct order
- Clear presentation of mathematical and arithmetical working linking given details of the problem to the results obtained.
- Evidence of checking results (mathematical, graphical, logic-common sense)

**Evidence of understanding of the topic (30% of the total marks for the assignment)**

- Explanation of choices made in the analysis (why is procedure required, why this particular procedure)
- Interpretation of results, eg limitations, direction of vectors

**Professional presentation (10% of the total marks for the assignment)**

- The work (job) is clearly identified (problem, date, analyst)
- Clear statement of each problem and its details and requirements
- Logical layout of analysis
- Appropriate use of diagrams, clear diagrams
- Correct use of terminology, conventions
- Clear English in the explanation of procedure and interpretation of results.
- Referencing of authoritative sources of equations and data

**Referencing Style**

- [Harvard \(author-date\)](#)

**Submission**

Online

**Submission Instructions**

To be submitted online through course website in Moodle

**Learning Outcomes Assessed**

- Explain terminology, concepts and principles used to describe and analyse control systems.
- Model and analyse systems comprising several subsystems, using block diagrams and mathematical description.
- Document the process of modelling and analysis of control systems and present the information in a professional manner.

**Graduate Attributes**



- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence

## 2 Assignment 2

### Assessment Type

Written Assessment

### Task Description

In this compulsory assessment item, students are expected to successfully complete the exercises specified in the course website in Moodle covering the learning outcomes 1, 4, 5, 7, 8 and 9. This assignment contains 6-8 problems which will require the theoretical knowledge gained through your learning during the first seven weeks. Marking scheme for each question will be published with the assignment and the marks for this assignment will contribute to 30% of the overall marks of this course. Assignment questions will be published in course Moodle site within the first two weeks of the term. Please also refer to assessment criteria for more details.

### Assessment Due Date

Week 9 Monday (11 May 2020) 9:00 am AEST

Submit to the link in Week 8 of the course website in Moodle as a WORD or PDF file.

### Return Date to Students

Week 11 Monday (25 May 2020)

Feedback given through course website in Moodle

### Weighting

30%

### Minimum mark or grade

Minimum mark or grade - Students must score more than 50% of the allocated marks for this assignment

### Assessment Criteria

**Each question in this assignment will be assessed separately for the criterion accuracy and correct results and given a mark from zero to 10 marks. 20% of the total marks for this assignment are based on accuracy and correct results, including:**

- Correct application of maths and arithmetic
- Answers clearly identified
- Correct results

**In addition, the assignment as a whole will be assessed against the following criteria:**

#### **Evidence of correct procedures (40% of the total marks for the assignment)**

- All necessary steps in analysis are present on correct order
- Clear presentation of mathematical and arithmetical working linking given details of the problem to the results obtained.
- Evidence of checking results (mathematical, graphical, logic-common sense)

#### **Evidence of understanding of the topic (30% of the total marks for the assignment)**

- Explanation of choices made in the analysis (why is procedure required, why this particular procedure)
- Interpretation of results, eg limitations, direction of vectors

#### **Professional presentation (10% of the total marks for the assignment)**

- The work (job) is clearly identified (problem, date, analyst)
- Clear statement of each problem and its details and requirements
- Logical layout of analysis
- Appropriate use of diagrams, clear diagrams
- Correct use of terminology, conventions
- Clear English in the explanation of procedure and interpretation of results.
- Referencing of authoritative sources of equations and data

### Referencing Style

- [Harvard \(author-date\)](#)

**Submission**

Online

**Submission Instructions**

To be submitted online through course website in Moodle

**Learning Outcomes Assessed**

- Explain terminology, concepts and principles used to describe and analyse control systems.
- Interpret the behaviour pattern of first order and second order systems in response to standard inputs so as to specify criteria for evaluating a control system.
- Interpret system behaviour using time domain methods to describe a continuous-time closed-loop system.
- Document the process of modelling and analysis of control systems and present the information in a professional manner.

**Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence

### 3 Assignment 3

**Assessment Type**

Written Assessment

**Task Description**

In this compulsory assessment item, students are expected to successfully complete the exercises specified in course website in Moodle covering learning outcomes 1,6,7,8 and 9. This assignment contains 6-8 problems which will require the theoretical knowledge gained through your learning during the first twelve weeks. Marking scheme for each question will be published with the assignment and the marks for this assignment will contribute to 25% of the overall marks of this course. Assignment questions will be published in course Moodle site within the first two weeks of the term. Please also refer to assessment criteria for more details.

**Assessment Due Date**

Review/Exam Week Monday (8 June 2020) 9:00 am AEST

Submit to the link in Week 12 of the course website in Moodle as a WORD or PDF file.

**Return Date to Students**

Exam Week Friday (19 June 2020)

Feedback given through course website in Moodle

**Weighting**

25%

**Minimum mark or grade**

Minimum mark or grade - Students must score more than 50% of the allocated marks for this assignment

**Assessment Criteria**

**Each question in this assignment will be assessed separately for the criterion accuracy and correct results and given a mark from zero to 10 marks. 20% of the total marks for this assignment are based on accuracy and**

**correct results, including:**

- Correct application of maths and arithmetic
- Answers clearly identified
- Correct results

**In addition, the assignment as a whole will be assessed against the following criteria:**

**Evidence of correct procedures (40% of the total marks for the assignment)**

- All necessary steps in analysis are present on correct order
- Clear presentation of mathematical and arithmetical working linking given details of the problem to the results obtained.
- Evidence of checking results (mathematical, graphical, logic-common sense)

**Evidence of understanding of the topic (30% of the total marks for the assignment)**

- Explanation of choices made in the analysis (why is procedure required, why this particular procedure)

- Interpretation of results, eg limitations, direction of vectors

### **Professional presentation (10% of the total marks for the assignment)**

- The work (job) is clearly identified (problem, date, analyst)
- Clear statement of each problem and its details and requirements
- Logical layout of analysis
- Appropriate use of diagrams, clear diagrams
- Correct use of terminology, conventions
- Clear English in the explanation of procedure and interpretation of results.
- Referencing of authoritative sources of equations and data

### **Referencing Style**

- [Harvard \(author-date\)](#)

### **Submission**

Online

### **Learning Outcomes Assessed**

- Explain terminology, concepts and principles used to describe and analyse control systems.
- Interpret system behaviour using frequency response methods to describe a continuous-time closed-loop system.
- Design compensators for closed loop systems to meet given specifications using standard techniques.
- Describe circuit structures which implement continuous controllers using passive and/or active elements and describe the discrete implementations.
- Document the process of modelling and analysis of control systems and present the information in a professional manner.

### **Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence

## **4 Residential School and Lab Report**

### **Assessment Type**

Practical and Written Assessment

### **Task Description**

Dates for the compulsory residential school will be notified to students through residential school calendar and the course Website. Students will be formed into teams for all residential school activities and each team must submit professional technical laboratory reports compiled into one Zipped file covering each laboratory experiment they will carry out during the residential school. The details of the experiments will be notified to students through the course Website. Please also refer to assessment criteria for more details.

### **Assessment Due Date**

Week 11 Monday (25 May 2020) 9:00 am AEST

Submit to the link in Week 10 of the course website in Moodle as a WORD or PDF file.

### **Return Date to Students**

Exam Week Monday (15 June 2020)

Feedback given through course website in Moodle

### **Weighting**

20%

### **Minimum mark or grade**

Minimum mark or grade - Students must score more than 50% of the allocated marks for this assignment

### **Assessment Criteria**

Marking of the team reports will be done according to the following criteria.

The accuracy and relevance of information

Application of knowledge

Language and grammar used in answering questions

Proper referencing of sources of information

Inclusion of all relevant Equations, images, data and tables, and the quality of presentation and layout.

## Referencing Style

- [Harvard \(author-date\)](#)

## Submission

Online Group

## Submission Instructions

To be submitted online through course website in Moodle

## Learning Outcomes Assessed

- Explain terminology, concepts and principles used to describe and analyse control systems.
- Describe and develop algorithms for discrete process control.
- Interpret the behaviour pattern of first order and second order systems in response to standard inputs so as to specify criteria for evaluating a control system.
- Interpret system behaviour using time domain methods to describe a continuous-time closed-loop system.
- Interpret system behaviour using frequency response methods to describe a continuous-time closed-loop system.
- Design compensators for closed loop systems to meet given specifications using standard techniques.
- Describe circuit structures which implement continuous controllers using passive and/or active elements and describe the discrete implementations.
- Document the process of modelling and analysis of control systems and present the information in a professional manner.
- Provide evidence of personal reflection on, and critical assessment of, team contributions and professional development.

## Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence
- Cross Cultural Competence
- Ethical practice

## 5 Workbook

### Assessment Type

Written Assessment

### Task Description

This is a Pass/Fail type assignment. The workbook has been designed as a collection of online quizzes and some analytical problems that will be published in the unit Moodle site. Online quizzes are designed to check the essential student understanding of each of the topics covered in the unit. The quizzes will be available quarterly within the 12 week term and each quiz will test the knowledge gained by the students during the three weeks immediately before the particular quiz. The numerical problems are designed to check the analytical ability of the students in relation to each topic. These problems will be made available at the beginning of the term in the unit Moodle site.

Analytical problems component of the workbook submission is separated into two parts as detailed below:

1. Submission of Part 1 of the Workbook - Due on Monday Week 06 before 23.45.
2. Submission of Part 2 of the Workbook - Due on Friday Review/Exam Week before 23.45.

More details on what is expected in these submissions will be made available through course Website.

### Assessment Due Date

Exam Week Monday (15 June 2020) 9:00 am AEST

Submit Part 2 of the Workbook to the link in Week 12 of the course website in Moodle as a WORD or PDF file.

### Return Date to Students

Exam Week Friday (19 June 2020)

Feedback given through course website in Moodle

### Weighting

Pass/Fail

### Minimum mark or grade

Minimum mark or grade - Students must achieve a pass for this assignment, which will be assessed by the unit coordinator based on the quality of the workbook submission.

**Assessment Criteria**

Analytical problems component of workbook questions will be set for each topic and will be available on the unit website. These questions are denoted as Compulsory questions or Extension questions. If students have difficulty with Workbook questions, they should seek assistance from colleagues in their online study groups in the first instance. ALL Compulsory questions must be successfully completed in the workbook and responses must show sufficient working and explanation to allow step-by-step checking by the lecturer. Workbook questions must be completed to a satisfactory level as determined by the lecturer for the students to achieve a pass grade.

**Referencing Style**

- [Harvard \(author-date\)](#)

**Submission**

Online

**Submission Instructions**

To be submitted online through course website in Moodle

**Learning Outcomes Assessed**

- Explain terminology, concepts and principles used to describe and analyse control systems.
- Model and analyse systems comprising several subsystems, using block diagrams and mathematical description.
- Describe and develop algorithms for discrete process control.
- Interpret the behaviour pattern of first order and second order systems in response to standard inputs so as to specify criteria for evaluating a control system.
- Interpret system behaviour using time domain methods to describe a continuous-time closed-loop system.
- Interpret system behaviour using frequency response methods to describe a continuous-time closed-loop system.
- Design compensators for closed loop systems to meet given specifications using standard techniques.
- Describe circuit structures which implement continuous controllers using passive and/or active elements and describe the discrete implementations.
- Document the process of modelling and analysis of control systems and present the information in a professional manner.
- Provide evidence of personal reflection on, and critical assessment of, team contributions and professional development.

**Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence
- Ethical practice

## Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

### What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

### Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

### Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

### What can you do to act with integrity?



#### Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



#### Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



#### Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem