ENAE12003 *Control Technology*
Term 1 - 2020

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

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

Assessment Tasks	Learning Outcomes									
	1	2	3	4	5	6	7	8	9	10
1 - Written Assessment - 25%	•	•							•	
2 - Written Assessment - 30%	•			•	•				•	
3 - Written Assessment - 25%	•					•	•	•	•	
4 - Practical and Written Assessment - 20%	•		•	•	•	•	•	•	•	•
5 - Written Assessment - 0%	•	•	•	•	•	•	•	•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes									
	1	2	3	4	5	6	7	8	9	10
1 - Communication	•	•	•	•	•	•	•	•	•	•
2 - Problem Solving	•	•	•	•	•	•	•	•	•	•
3 - Critical Thinking	•	•	•	•	•	•	•	•	•	•
4 - Information Literacy	•	•	•	•	•	•	•	•	•	•
5 - Team Work	•	•	•	•	•	•	•	•	•	•
6 - Information Technology Competence	•	•	•	•	•	•	•	•	•	•
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 - 25%	•	•	•	•		•				
2 - Written Assessment - 30%	•	•	•	•		•				
3 - Written Assessment - 25%	•	•	•	•		•				
4 - Practical and Written Assessment - 20%	•	•	•	•	•	•	•	•		

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

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

Schedule

Week 1 - 09 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic

Overview of control systems	Chapter 1: Introduction Week 1 Study Guide	

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. **Assignment 1** Due: Week 5 Monday (6 Apr 2020) 11:59 pm AEST

Vacation Week - 13 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic

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	**Assignment 2** Due: Week 9 Monday (11 May 2020) 9:00 am AEST

Week 10 - 18 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	

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	**Residential School and Lab Report** 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		**Assignment 3** Due: Review/Exam Week Monday (8 June 2020) 9:00 am AEST

Exam Week - 15 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic
		Workbook 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 of 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