

In Progress

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



ENEM28002 *Advanced Modelling, Simulation and Control of Dynamic Systems*

Term 1 - 2023

Profile information current as at 26/04/2024 12:51 pm

All details in this unit profile for ENEM28002 have been officially approved by CQUiversity 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 project-based learning unit examines the behaviour of mechanical systems. You will apply knowledge of engineering science and mathematics to model, simulate and analyse mechanical systems and consider the nature of engineering assumptions and the effects of uncertainty on analysis and modelling. You will apply control and vibration theory, design and analyse linear and non-linear mathematical models and use simulation software to predict the behaviour of mechanical systems. You will be expected to apply the modelling and analysis of mechanical systems to industrial problems and contexts. You will have opportunities to work individually and in teams to complete projects and to develop interpersonal and technical communication skills. You will prepare professional documentation of problem solutions and project reports.

Details

Career Level: *Postgraduate*

Unit Level: *Level 8*

Credit Points: 12

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.25

Pre-requisites or Co-requisites

There are no requisites for this unit.

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 ENEM28002

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 12-credit Postgraduate unit at CQUniversity requires an overall time commitment of an average of 25 hours of study per week, making a total of 300 hours for the unit.

Class Timetable

[Regional Campuses](#)

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

[Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

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 Student survey

Feedback

Overall, the material sources and contents for this unit are good.

Recommendation

The unit materials shall be reviewed and updated.

Feedback from Student survey

Feedback

Some assessments' requirements are not clearly stated.

Recommendation

Review and revise the assessments and submit them for peer review before hosting them on the unit Moodle.

Feedback from Unit Coordinator reflection

Feedback

The workload for students in this unit is high.

Recommendation

The lecturer needs to inspire students to regularly work hard in this unit

Unit Learning Outcomes

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

1. Design mathematical models that analyse and evaluate complex mechanical systems
2. Explain and apply control theory and control system approaches to complex mechanical systems
3. Apply engineering assumptions in building mathematical models of complex mechanical systems
4. Relate theory to the operation and maintenance of mechanical systems in the industrial context
5. Identify and evaluate engineering uncertainty and the limitations of mathematical models
6. Work collaboratively in a team to produce high-quality outputs
7. Create professional documentation including the use of mechanical systems terminology, equations, symbols and diagrams.

The Learning Outcomes for this unit are linked with the Engineers Australia Stage 1 Competency Standards for Professional Engineers in the areas of 1. Knowledge and Skill Base, 2. Engineering Application Ability and 3. Professional and Personal Attributes at the following levels:

Introductory Level

- 3.3 Creative, innovative and pro-active demeanour.
- 3.4 Professional use and management of information.
- 3.5 Orderly management of self, and professional conduct.

Intermediate Level

- 1.4 Discernment of knowledge development and research directions within the engineering discipline.
- 3.2 Effective oral and written communication in professional and lay domains.

Advanced Level

- 1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.
- 1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.
- 1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline.
- 2.1 Application of established engineering methods to complex engineering problem solving.
- 2.2 Fluent application of engineering techniques, tools and resources.
- 2.3 Application of systematic engineering synthesis and design processes.
- 2.4 Application of systematic approaches to the conduct and management of engineering projects.
- 3.6 Effective team membership and team leadership.

Refer to the Engineering Postgraduate Units Moodle site for further information on the Engineers Australia's Stage 1 Competency Standard for Professional Engineers and course level mapping information

<https://moodle.cqu.edu.au/course/view.php?id=11382>

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
1 - Project (applied) - 25%	●					●	
2 - Project (applied) - 20%		●				●	
3 - Laboratory/Practical - 25%				●			
4 - Portfolio - 30%			●		●		●

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
1 - Knowledge	○	○	○	○			○
2 - Communication		○				○	○
3 - Cognitive, technical and creative skills	○		○		○		
4 - Research		○					
5 - Self-management						○	
6 - Ethical and Professional Responsibility							
7 - Leadership							
8 - 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
1 - Project (applied) - 25%	○	○	○	○	○			
2 - Project (applied) - 20%	○	○	○	○	○			
3 - Laboratory/Practical - 25%	○	○				○		
4 - Portfolio - 30%		○	○		○			

Textbooks and Resources

Textbooks

ENEM28002

Supplementary

Mechanical Vibrations in SI Units

Edition: 6th (2017)

Authors: Rao, Singiresu

Pearson

Harlow, Essex , USA

ISBN: 9781292178608

Binding: Paperback

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Supplementary

Modeling And Analysis Of Dynamic Systems

Edition: 3rd (2001)

Authors: Close, Frederick & Newell

John Wiley

ISBN: 9780471394426

Binding: Paperback

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Supplementary

Theory of Vibrations with Application

Edition: 5th (2014)

Authors: Thomson, W & Dahleh, M

ISBN: 9781292042718

Binding: Paperback

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.