ENEG11006 *Engineering Statics*
Term 3 - 2024

Profile information current as at 12/07/2025 11:50 am

General Information

Overview
This unit introduces Newtonian physics concepts governing the behaviour of stationary engineering systems. To determine design parameters, you will study forces applied to two and three-dimensional bodies under the static equilibrium state. You will determine internal forces, calculate support reactions, and develop Free-body, Shear Force and Bending Moments diagrams. You will also calculate sectional properties, including the center of gravity, centroid, and second moment of inertia. Upon completing this unit, you will understand the foundations of engineering statics enabling progress to advanced system/structural analysis and development of sustainable infrastructure

Details
Career Level: *Undergraduate*
Unit Level: *Level 1*
Credit Points: *6*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.125*

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 3 - 2024

- Online

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. **Online Quiz(zes)**
Weighting: 20%
2. **Written Assessment**
Weighting: 20%
3. **Written Assessment**
Weighting: 20%
4. **Online Test**
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.

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 SUTE

Feedback

Students praised the lecturer's engaging teaching style, noting that it significantly improved their understanding of mathematics and statics concepts. Many found the explanations clear, well-structured, and informative, making learning more enjoyable.

Recommendation

Continue incorporating interactive teaching strategies and varied problem-solving approaches to reinforce learning and maintain engagement.

Feedback from SUTE

Feedback

Some students experienced disruptions due to faulty equipment during streamed lectures/tutorials, temporarily impacting their learning experience.

Recommendation

Liaise with TASAC services before each session to ensure equipment is functioning properly. If issues arise, have a backup plan, such as pre-recorded content or alternative streaming options to minimise disruptions.

Feedback from SUTE

Feedback

Students appreciated the many clear and concise examples provided on Moodle, which helped reinforce their understanding of key concepts. They found the explanations well-structured and informative, making it easier to grasp complex topics.

Recommendation

Continue incorporating diverse problem types, including fundamental and varied problems from the textbook, to offer different perspectives on key topics.

Unit Learning Outcomes

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

1. Analyse two and three-dimensional force systems to determine resultant forces
2. Apply static equilibrium concepts to bodies with external forces and moments, create Free-body diagrams and determine support reactions
3. Analyse statically determinate structures, including beams, frames, and trusses, to calculate internal forces and create Shear-force and Bending-moment diagrams
4. Calculate sectional properties such as center of gravity, centroid, and second moment of Inertia of simple structural forms
5. Demonstrate a professional level of communication skills in written work.

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
1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences underpin the engineering discipline. (LO: 1N 2N 3N 4N)
1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline. (LO: 2N 3N 4N)
2.1 Application of established engineering methods to complex engineering problem-solving. (LO: 2N 3N 4N)

Intermediate
1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline. (LO: 1N 2N 3I 4N)
1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline. (LO: 2N 3I)
3.2 Effective oral and written communication in professional and lay domains. (LO: 5I)

Note: LO refers to the Learning Outcome number(s) which link to the competency and the levels: N – Introductory, I – Intermediate, and A - Advanced.)
Refer to the Engineering Undergraduate Course Moodle site for further information on Engineers Australia's Stage 1 Competency Standard for Professional Engineers and course-level mapping information)
https://moodle.cqu.edu.au/course/view.php?id=1511

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
1 - Online Quiz(zes) - 20%	•	•			
2 - Written Assessment - 20%	•	•			•
3 - Written Assessment - 20%			•		•
4 - Online Test - 40%	•	•	•	•	

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
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					

Textbooks and Resources

Textbooks

ENEG11006

Prescribed

Engineering Mechanics STATICS
Edition: 14 or later
Authors: R.C. Hibbeler
Pearson
ISBN: 1488689806
Binding: Paperback

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

Hassan Baji Unit Coordinator
h.baji@cqu.edu.au

Schedule

Week 1 - 04 Nov 2024

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Statics	Chapter 1: General Principles Chapter 2: Force Vectors	

Week 2 - 11 Nov 2024

Module/Topic	Chapter	Events and Submissions/Topic
Equilibrium of a Particle	Chapter 3: Equilibrium of a Particle Chapter 4: Force System Resultants	

Week 3 - 18 Nov 2024

Module/Topic	Chapter	Events and Submissions/Topic
Equilibrium of a Rigid Body	Chapter 5: Equilibrium of a Rigid Body	Progressive Test #1: The test opens at 9:00 AM Monday of this week and closes at 9:00 PM Monday of next week.

Week 4 - 25 Nov 2024

Module/Topic	Chapter	Events and Submissions/Topic
Force Analysis in 3D	Chapter 2: Force Vectors Chapter 4: Force System Resultants	

Week 5 - 02 Dec 2024

Module/Topic	Chapter	Events and Submissions/Topic
Equilibrium in 3D	Chapter 3: Equilibrium of a Particle Chapter 5: Equilibrium of a Rigid Body	Progressive Test #2: The test opens at 9:00 AM Monday of this week and closes at 9:00 PM Monday of next week.

Week 6 - 09 Dec 2024

Module/Topic	Chapter	Events and Submissions/Topic
Analysis of Trusses: Method of Joints and Section	Chapter 6: Structural Analysis	

Week 7 - 16 Dec 2024

Module/Topic	Chapter	Events and Submissions/Topic
Beams: Internal Forces	Chapter 7: Internal Forces	Progressive Test #3: The test opens at 9:00 AM Monday of this week and closes at 9:00 PM Monday of next week. **Assignment 1** Due: Week 7 Monday (16 Dec 2024) 11:59 pm AEST

Vacation Week - 23 Dec 2024

Module/Topic	Chapter	Events and Submissions/Topic

Vacation Week - 30 Dec 2024

Module/Topic	Chapter	Events and Submissions/Topic

Week 8 - 06 Jan 2025

Module/Topic	Chapter	Events and Submissions/Topic
Beams: Axial Force, Shear Force and Bending Moment Diagrams	Chapter 7: Internal Forces	

Week 9 - 13 Jan 2025

Module/Topic	Chapter	Events and Submissions/Topic
Friction	Chapter 8: Friction	

Week 10 - 20 Jan 2025

Module/Topic	Chapter	Events and Submissions/Topic
Center of Gravity and Centroid	Chapter 9: Center of Gravity and Centroid	

Week 11 - 27 Jan 2025

Module/Topic	Chapter	Events and Submissions/Topic
Moment of Inertia	Chapter 10: Moments of Inertia	**Assignment 2** Due: Week 11 Monday (27 Jan 2025) 11:59 pm AEST

Week 12 - 03 Feb 2025

Module/Topic	Chapter	Events and Submissions/Topic
Revision		

Exam Week - 10 Feb 2025

Module/Topic	Chapter	Events and Submissions/Topic
End of Term Test date will be announced on Moodle.		

Assessment Tasks

1 Progressive Tests

Assessment Type
Online Quiz(zes)

Task Description
This assessment task consists of three "Progressive Tests". First, second and third carries 7%, 7%, and 6% marks, respectively. Each test consists of a number of numerical questions.
Important Notes:

- Each Test is set for 60 minutes. You have 60 minutes from when you start your attempt to submit your answers.
- If you start but leave a test and come back to it later, your 60 min time may have lapsed and you will be scored zero for that attempt.
- You can attempt each test up to three (3) times within the given time frame as specified in the schedule.
- The test will be automatically closed after the end of the given time frame.
- The final mark will be the highest of all the attempts.
- Even though the tests are open for a few days, it is expected that your first attempt would be on the first day.
- The Tests cannot generally be deferred. However, under exceptional circumstances, if you have valid reasons to defer the test(s), please contact the Unit Coordinator with documents of proof before the due date.

Number of Quizzes
3

Frequency of Quizzes
Other

Assessment Due Date

Tests opening and closing details are given on the unit schedule.

Return Date to Students

Immediately after the test completion.

Weighting
20%

Assessment Criteria

- Full marks allocated to a question will be awarded for each correct answer.
- No penalty for wrong answers.

Referencing Style

- Harvard (author-date)

Submission
Online

Learning Outcomes Assessed

- Analyse two and three-dimensional force systems to determine resultant forces
- Apply static equilibrium concepts to bodies with external forces and moments, create Free-body diagrams and determine support reactions

2 Assignment 1

Assessment Type
Written Assessment

Task Description
The aim of this assignment is to allow the students to demonstrate their understanding of various concepts, theories and processes studied/developed in weeks 1 to 5.
Assignment 1 will be available by end of week 1 through unit Moodle webpage.

Assessment Due Date
Week 7 Monday (16 Dec 2024) 11:59 pm AEST

Return Date to Students
Vacation Week Monday (30 Dec 2024)

Feedback will be returned two weeks after assignment due date.

Weighting
20%

Assessment Criteria
Each solution should have the following items:

- Accurate drawing of assumed Sign Conventions, Free-Body and other diagrams as required for the solution. [20%]
- Accuracy in Calculations. [80%]
- All the steps should be explained in full detail.
- A single PDF file with clear and readable working should be submitted.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Submit a single PDF file.

Learning Outcomes Assessed

- Analyse two and three-dimensional force systems to determine resultant forces
- Apply static equilibrium concepts to bodies with external forces and moments, create Free-body diagrams and determine support reactions
- Demonstrate a professional level of communication skills in written work.

3 Assignment 2

Assessment Type
Written Assessment

Task Description
The aim of this assignment is to allow the students to demonstrate their understanding of various concepts, theories and processes studied/developed in weeks 6 to 9.
Assignment 2 will be available by end of week 6 through unit Moodle webpage.

Assessment Due Date
Week 11 Monday (27 Jan 2025) 11:59 pm AEST

Return Date to Students
Exam Week Monday (10 Feb 2025)

Feedback will be returned within two weeks after assignment due date.

Weighting
20%

Assessment Criteria
Each solution should have the following items:

- Accurate drawing of assumed Sign Conventions, Free-Body and other diagrams as required for the solution. [20%]
- Accuracy in Calculations. [80%]
- All the steps should be explained in full detail.
- A single PDF file with clear and readable working should be submitted.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Submit a single PDF file.

Learning Outcomes Assessed

- Analyse statically determinate structures, including beams, frames, and trusses, to calculate internal forces and create Shear-force and Bending-moment diagrams
- Demonstrate a professional level of communication skills in written work.

4 End of Term Test

Assessment Type
Online Test

Task Description
This assessment task is an online test that consists of several numerical questions. Students have three hours to complete their solution. An extra half an hour is provided for scanning and uploading and submitting the assessment.
Important Notes:

- The test will be during the exam week. The exact date will be announced on Moodle.
- The assessment duration is set for 180 minutes with an additional 30 minutes for scanning and uploading.
- The test will be automatically closed after the end of the given time frame.
- The test cannot generally be deferred. However, under exceptional circumstances, if you have valid reasons to defer the test, you can apply for assessment deferral with documents of proof before the due date.

Assessment Due Date

The online test date will be announced on Moodle page of the unit. The test will be during the exam week.

Return Date to Students

Weighting
40%

Minimum mark or grade
50% (20/40)

Assessment Criteria

- Each solution should have the following items:
  - Accurate drawing of assumed Sign Conventions, Free-Body and other diagrams as required for the solution. [20%]
  - Accuracy in Calculations. [80%]
  - All the steps should be explained in full detail.
  - A single PDF file with clear and readable working should be submitted.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Submit a single PDF file.

Learning Outcomes Assessed

- Analyse two and three-dimensional force systems to determine resultant forces
- Apply static equilibrium concepts to bodies with external forces and moments, create Free-body diagrams and determine support reactions
- Analyse statically determinate structures, including beams, frames, and trusses, to calculate internal forces and create Shear-force and Bending-moment diagrams
- Calculate sectional properties such as center of gravity, centroid, and second moment of Inertia of simple structural forms

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