ENEG11006 *Engineering Statics*
Term 3 - 2018

Profile information current as at 23/04/2024 09:30 pm

General Information

Overview
Understanding forces applied to structural elements and static equilibrium concepts is essential for analysis of statically determinate engineering structures including beams, trusses and frames. You will analyse such structures under external forces to create Free-body diagrams, calculate support reactions and determine internal forces acting on the structures. You will be drawing diagrams of Shear Force and Bending Moments after calculating the internal forces.

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 - 2018

- Distance

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. **Examination**
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 Moodle Feedback

Feedback

Some students find assignment II design problems were difficult because it needs to go beyond what had been taught in the class whereas others find that was the best aspect of the unit.

Recommendation

Student Engineers need to practice open-ended design problems. The requirements of the assessment item and its importance should be communicated to the students more often.

Feedback from Moodle Feedback

Feedback

Duration of lectures should be extended to two hours instead of one.

Recommendation

Increase lectures or instructional videos to students.

Unit Learning Outcomes

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

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

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

Alignment of Learning Outcomes, Assessment and Graduate Attributes

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

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
1 - Online Quiz(zes) - 20%	•	•	•	•	
2 - Written Assessment - 20%	•	•	•	•	•
3 - Written Assessment - 20%	•	•	•	•	•
4 - Examination - 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					

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Online Quiz(zes) - 20%	•	•	•					•		
2 - Written Assessment - 20%	•	•	•					•		
3 - Written Assessment - 20%	•	•	•					•		
4 - Examination - 40%	•	•	•					•		

Textbooks and Resources

Textbooks

ENEG11006

Prescribed

Engineering Mechanics STATICS
Edition: 14 (2017)
Authors: R.C. Hibbeler
Pearson
Harlow , Essex , UK
Binding: Hardcover

Additional Textbook Information
This text comes value packed with the Study Pack (includes chapter reviews) and Modified Mastering Engineering, at a reduced cost to students. Copies can be purchased at the CQUni Bookshop here: http://bookshop.cqu.edu.au (search on the Unit code)

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 - 05 Nov 2018

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

Week 2 - 12 Nov 2018

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

Week 3 - 19 Nov 2018

Module/Topic	Chapter	Events and Submissions/Topic
Equilibrium of a Rigid Body I	Chapter 5 Equilibrium of a Rigid Body	Test 1: Covers Contents from Weeks 1 and 2 The test opens at 9:00 AM Monday of this week and closes at 9:00 AM Monday of the next week.

Week 4 - 26 Nov 2018

Module/Topic	Chapter	Events and Submissions/Topic
Equilibrium of a Rigid Body II	Chapter 5 Equilibrium of a Rigid Body	Test 2: Covers Contents from Week 3 The test opens at 9:00 AM Monday of this week and closes at 9:00 AM Monday of the next week.

Vacation Week - 03 Dec 2018

Module/Topic	Chapter	Events and Submissions/Topic

Week 5 - 10 Dec 2018

Module/Topic	Chapter	Events and Submissions/Topic
Center of Gravity and Centroid Moment of Inertia	Chapter 9 Center of Gravity and Centroid Chapter 10 Moments of Inertia	Test 3: Covers Contents from Week 4 The test opens at 9:00 AM Monday of this week and closes at 9:00 AM Monday of the next week.

Week 6 - 17 Dec 2018

Module/Topic	Chapter	Events and Submissions/Topic
Analysis of Trusses: Method of Joints	Chapter 6 Structural Analysis	**Assignment 1 is due this week.** **Assignment 1** Due: Week 6 Wednesday (19 Dec 2018) 5:00 pm AEST

Week 7 - 31 Dec 2018

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

Week 8 - 07 Jan 2019

Module/Topic	Chapter	Events and Submissions/Topic
Internal Forces I: Calculation of Axial Force, Shear Force and Bending Moment (Simple Systems)	Chapter 7 Internal Forces	

Week 9 - 14 Jan 2019

Module/Topic	Chapter	Events and Submissions/Topic
Internal Forces II: Calculation of Axial Force, Shear Force and Bending Moment (Complex systems)	Chapter 7 Internal Forces	

Week 10 - 21 Jan 2019

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

Week 11 - 28 Jan 2019

Module/Topic	Chapter	Events and Submissions/Topic
Friction	Chapter 8 Friction	**Assignment 2 is due this week.** **Assignment 2** Due: Week 11 Wednesday (30 Jan 2019) 5:00 pm AEST

Week 12 - 04 Feb 2019

Module/Topic	Chapter	Events and Submissions/Topic
Revision		

Exam Week - 11 Feb 2019

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 5-10 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 the Test up to **THREE 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.
- 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 schedule section.

Return Date to Students

Immediately after the test.

Weighting
20%

Assessment Criteria
Full marks allocated to a question will be awarded for each correct answer. No partial marks will be allocated.

Referencing Style

- Harvard (author-date)

Submission
Online

Learning Outcomes Assessed

- Analyse two dimensional force systems to determine resultant forces
- Calculate sectional properties such as centre of gravity, centroid and second moment of Inertia of simple structural forms
- 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.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking

- Ethical practice

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 the topics covered until week 5 from the Study Schedule.
Assignment 1 will be available by start of Week 1 through unit website.

Assessment Due Date
Week 6 Wednesday (19 Dec 2018) 5:00 pm AEST

Return Date to Students

Feedback will be returned two weeks after assignment due date.

Weighting
20%

Assessment Criteria
Each solution should have the following items:

- Statement of a problem in your own words. [10%]
- Accurate drawing of assumed Sign Conventions, Free-Body and other diagrams as required for the solution.[20%]
- Accuracy in Calculations. [70%]
- Appropriate and Professional level of Communication [Pass/Fail - All the steps should be explained in full detail. You should get Pass from this criteria to get marks from the others].

Referencing Style

- Harvard (author-date)

Submission
Online

Learning Outcomes Assessed

- Analyse two dimensional force systems to determine resultant forces
- Calculate sectional properties such as centre of gravity, centroid and second moment of Inertia of simple structural forms
- 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.
- Demonstrate a professional level of communication skills in written work

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Ethical practice

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 the topics covered from week 6 to week 11 from the Study Schedule.
This assessment will provide you an opportunity to show your understanding on the calculation of Internal forces, drawing of Internal Force diagrams and use them to design a structural member. Assignment questions can be downloaded from the unit website.
Assignment 2 will be available by end of week 6 through unit website.

Assessment Due Date
Week 11 Wednesday (30 Jan 2019) 5:00 pm AEST

Return Date to Students

The assignment will be returned within two weeks.

Weighting
20%

Assessment Criteria
Each solution should have the following items:

- Statement of a problem in your own words. [10%]
- Accurate drawing of assumed Sign Conventions, Free-Body and other diagrams as required for the solution.[20%]
- Accuracy in Calculations. [70%]
- Appropriate and Professional level of Communication [Pass/Fail - All the steps should be explained in full detail. You should get Pass from this criteria to get marks from the others].

Referencing Style

- Harvard (author-date)

Submission
Online

Learning Outcomes Assessed

- Analyse two dimensional force systems to determine resultant forces
- Calculate sectional properties such as centre of gravity, centroid and second moment of Inertia of simple structural forms
- 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.
- Demonstrate a professional level of communication skills in written work

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Ethical practice

Examination

Outline
Complete an invigilated examination.

Date
During the examination period at a CQUniversity examination centre.

Weighting
40%

Length
180 minutes

Minimum mark or grade
50%

Exam Conditions
Closed Book.

Materials
Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).
Calculator - non-programmable, no text retrieval, silent only

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