



# ENAM12002 *Mechanical Analysis*

## Term 1 - 2021

Profile information current as at 20/04/2024 01:48 pm

All details in this unit profile for ENAM12002 have been officially approved by CQU University 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 introduces students to key concepts and principles of mechanical analysis. They explain how engineering structures and components carry and transmit loads, and analyse and determine properties of sections, forces in structures and assemblies, stress and strain in members and components, deflections, stresses in circular shafts, principle stresses and buckling of columns. Students analyse mechanical failures, determine fatigue life of components, and explain common assumptions made in analysis, their consequences and validity. Students are required to show they work productively, both individually and collaboratively, to solve problems, and document and communicate their work clearly in a professional manner.

#### 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

Prerequisites: MATH11160 Technology Mathematics AND (ENAG11005 Mechanics OR ENEG11006 Engineering Statics) AND (ENEG11008 Materials for Engineers OR ENAG11003 Engineering Materials)

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 - 2021

- 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. **Written Assessment**

Weighting: 30%

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

Weighting: 20%

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

Weighting: 50%

#### 4. **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 Student Feedback

**Feedback**

This unit helped to tie together with some of the other units such as statics.

**Recommendation**

The unit review will ensure that this unit will continue to emphasise the use of previously learned concepts.

#### Feedback from Student Feedback

**Feedback**

Relevant resources were thoroughly provided.

**Recommendation**

This will be continued and updated

#### Feedback from Student Feedback

**Feedback**

The time allowed to complete could possibly be extended and definitely a few preliminary steps added in some of the weeks to ensure understanding.

**Recommendation**

The studying time should be organised well by the students, and meanwhile a minor change to the curriculum will be made for students to have more time on Workbook Activities.

#### Feedback from Student Feedback

**Feedback**

Zoom sessions should be conducted in a video conferencing room.

**Recommendation**

A conferencing room or a document camera will be booked for Zoom sessions.

#### Feedback from Staff feedback

**Feedback**

Making a minor change to the curriculum that suits student's learning process.

**Recommendation**

The revised curriculum will be reviewed and approved by the unit reviewers and DL.

## Unit Learning Outcomes

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

1. Explain the basic concepts and principles of engineering mechanics
2. Explain how engineering structures and components carry and transmit loads
3. Analyse and determine:
  - o Properties of plane cross sections
  - o Forces acting in members of structures and assemblies in static equilibrium
  - o Normal stress and strain in members and components in static equilibrium
  - o Deflection of simple beams and trusses
  - o Stresses in circular shafts
  - o Principle stresses and maximum shear stresses using Mohr's circle
  - o Buckling behaviour of columns
4. Analyse failure of structures and components and determine fatigue lives of components
5. Explain the nature of engineering assumptions and explain commonly made assumptions and consequent limitations of the validity of analyses based on such assumptions
6. Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development
7. Formulate and solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems

The Learning Outcomes for this unit are linked with Engineers Australia's Stage 1 Competency Standard for Engineering Associates.

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes							
	1	2	3		4	5	6	7
1 - Communication	Introductory	Introductory	Intermediate	Intermediate	Graduate	Professional	Advanced	
2 - Problem Solving	Graduate	Graduate	Graduate	Graduate	Professional	Professional	Advanced	
3 - Critical Thinking	Introductory	Introductory	Intermediate	Intermediate	Graduate	Professional	Advanced	
4 - Information Literacy	Graduate	Graduate	Graduate	Graduate	Professional		Advanced	
5 - Team Work						Professional	Advanced	
6 - Information Technology Competence						Professional	Advanced	
7 - Cross Cultural Competence						Professional		
8 - Ethical practice						Professional		
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 - 30%	Graduate	Graduate	Graduate	Professional						
2 - Written Assessment - 20%	Graduate	Graduate	Graduate	Professional						
3 - Written Assessment - 50%	Graduate	Graduate	Graduate	Professional						
4 - Written Assessment - 0%	Graduate	Graduate	Graduate	Professional	Professional	Professional	Professional	Advanced		

## Textbooks and Resources

### Textbooks

ENAM12002

#### Prescribed

##### Mechanics of Materials

Edition: 6th (2007)

Authors: Riley, WF, Sturges, LD & Morris, DH

John Wiley & Sons

ISBN: 13 978-0-471-70511-6

Binding: Other

#### Additional Textbook Information

Additional Textbook Information

Paper 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)
- A4 scanner - To allow online submission of hand written assignments and workbook, and to allow posting of work to discussion forums.

## Referencing Style

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

For further information, see the Assessment Tasks.

## Teaching Contacts

**Yan Sun** Unit Coordinator

[y.q.sun@cqu.edu.au](mailto:y.q.sun@cqu.edu.au)

## Schedule

### Week 1 - 08 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Section 1.1: Structures and mechanisms, Loads, type of supports, and reaction components, Equilibrium and free body diagrams, Analysis of pin jointed structures: method of joints and method of sections.	Chapter 1 Rigid Body Mechanics  Exercises: Workbook activity 1-1 ~ activity 1-6 in Study Guide One	Download & start: <b>Assignment One</b> , Start: Workbook, Weekly reflection submission, Due 5pm Monday 15th Mar.

### Week 2 - 15 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
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### Section 1.2:

Analysis of beams: Shear force & SFD, Bending moment & BMD; Geometrical properties of plane sections: Centroid, Moment of inertia and polar moment of inertia (only dealing with a cross section made up of a series of regular geometric shapes).

### Chapter 1 Rigid Body Mechanics

Exercises:  
Workbook activity 1-1 ~ activity 1-6 in Study Guide One

Weekly reflection submission, Due 5pm Monday 22nd Mar.

## Week 3 - 22 Mar 2021

### Module/Topic

### Section 2.1:

Elastic bodies and engineering materials, Hooke's law, Young's modulus of elasticity and Poisson's ratio, Normal stress, Normal strain, Axial deformation: Axial load vs axial deformation relation, Tensile stress and tensile strain.

### Chapter

### Chapter 2 Deformation of Solids

Exercises:  
Workbook activity 2-1 ~ activity 2-7 in Study Guide Two

### Events and Submissions/Topic

Weekly reflection submission, Due 5pm Monday 29th Mar.

## Week 4 - 29 Mar 2021

### Module/Topic

### Section 2.2:

Bending stress, Shear stress due to lateral loading: Beams of rectangular cross section, I beams; Torsion of circular shafts: Shear stress distribution in circular shaft, Angle of twist, Hollow sections, Shear flow, Open section and its weakness.

### Chapter

### Chapter 2 Deformation of Solids

Exercises:

### Events and Submissions/Topic

Weekly reflection submission, Due 5pm Monday 5th April.  
Submit your Workbook completed so far (due 5pm Monday 5th April)

## Week 5 - 05 Apr 2021

### Module/Topic

### Section 3.1

Analysis of stress: Strain gauging and strain measurement: linear gauges, rosettes; Combined axial, bending and torsional stresses, Stress at a point.

### Chapter

### Chapter 3 Analysis of Stress

Exercises:  
Workbook activity 3-1 ~ activity 3-9 in Study Guide Three

### Events and Submissions/Topic

Weekly reflection submission, Due 5pm Monday 19th April.

**Workbook** Due: Week 5 Friday (9 Apr 2021) 11:45 pm AEST

## Vacation Week - 12 Apr 2021

### Module/Topic

### Chapter

### Events and Submissions/Topic

**Assignment One Due:** Vacation Week

Download & start: **Assignment Two** Monday (12 Apr 2020) 5:00 pm AEST

**Assignment 1 Due:** Vacation Week Monday (12 Apr 2021) 5:00 pm AEST

## Week 6 - 19 Apr 2021

### Module/Topic

### Section 3.2

Stress transformation: stress in oblique planes, Principal stresses, principal planes, and maximum shear stress.

### Chapter

### Chapter 3 Analysis of Stress

Exercises:  
Workbook activity 3-1 ~ activity 3-9 in Study Guide Three

### Events and Submissions/Topic

Weekly reflection submission, Due 5pm Monday 26th April.

## Week 7 - 26 Apr 2021

### Module/Topic

### Chapter

### Events and Submissions/Topic

### Chapter 3 Analysis of Stress

Section 3.3  
Mohr's circle, Stress concentration,  
Thermal stresses.

Exercises:  
Workbook activity 3-1 ~  
activity 3-9 in Study Guide  
Three

Weekly reflection submission, Due  
5pm Monday 3rd May.

#### Week 8 - 03 May 2021

##### Module/Topic

##### Chapter

##### Events and Submissions/Topic

Section 4.1:  
Columns: buckling, long and short  
columns, Effective length and  
effect of boundary conditions.

##### Chapter 4 Structures

Exercises:  
Workbook activity 4-1 ~ activity 4-7 in  
Study Guide Four

Weekly reflection submission, Due  
5pm Monday 10th May.

#### Week 9 - 10 May 2021

##### Module/Topic

##### Chapter

##### Events and Submissions/Topic

Section 4.2:  
Beams: deflection of beams,  
slender beams and lateral  
buckling.

Chapter 4 Structures

Exercises:  
Workbook activity 4-1 ~ activity  
4-7 in Study Guide Four

Weekly reflection submission, Due  
5pm Monday 17th May.

**Assignment Two** Due: Week 9  
Monday  
(10 May 2020) 5:00 pm AEST  
Download & start: **Assignment  
Three**

**Assignment 2** Due: Week 9 Monday  
(10 May 2021) 5:00 pm AEST

#### Week 10 - 17 May 2021

##### Module/Topic

##### Chapter

##### Events and Submissions/Topic

Section 5.1:  
Yielding, Failure criteria for ductile  
materials, Fracture of brittle  
materials.

##### Chapter 5 Plasticity and Failure

Exercises:  
Workbook activity 5-1 ~ activity 5-4 in  
Study Guide Five

Weekly reflection submission, Due  
5pm Monday 24th May.

#### Week 11 - 24 May 2021

##### Module/Topic

##### Chapter

##### Events and Submissions/Topic

Section 5.2:  
Fatigue, Viscoelasticity

##### Chapter 5 Plasticity and Failure

Exercises:  
Workbook activity 5-1 ~ activity  
5-4 in Study Guide Five

Weekly reflection submission, Due  
5pm Monday 31st May.

#### Week 12 - 31 May 2021

##### Module/Topic

##### Chapter

##### Events and Submissions/Topic

Revision

Weekly reflection submission, Due  
5pm Monday 7th June.

#### Review/Exam Week - 07 Jun 2021

##### Module/Topic

##### Chapter

##### Events and Submissions/Topic

#### Exam Week - 14 Jun 2021

##### Module/Topic

##### Chapter

##### Events and Submissions/Topic

**Assignment Three** Due: Exam Week  
Monday (14 Jun 2020) 5:00 pm AEST  
**Workbook** Due: Exam Week  
Monday (14 Jun 2020) 5:00 pm AEST

**Assignment 3** Due: Exam Week  
Monday (14 June 2021) 5:00 pm AEST



# Assessment Tasks

## 1 Assignment 1

### Assessment Type

Written Assessment

### Task Description

This assignment will assess the material from Weeks 1 to 4. Full assignment details are on the moodle course website.

### Assessment Due Date

Vacation Week Monday (12 Apr 2021) 5:00 pm AEST

### Return Date to Students

Week 6 Monday (19 Apr 2021)

### Weighting

30%

### Minimum mark or grade

15/30

### Assessment Criteria

Your assignment will be assessed against four assessment criteria:

- 1) Accuracy and correct results
  - Correct application of maths and arithmetic
  - Answers clearly identified (please underline or highlight answers)
  - Correct results
- 2) Evidence of correct procedures
  - All necessary steps in analysis are present
  - Clear presentation of mathematical and arithmetical working linking the given details of the problem to the results obtained
  - Indication of the equations used when using spreadsheets (eg Microsoft Excel) or other software
  - Evidence of checking results (mathematical, graphical, logic-common sense)
- 3) Evidence of understanding of the topic
  - Explanation of any assumptions made
  - Explanation of choices made in the analysis (why is this procedure is required)
  - Interpretation of results, eg limitations, direction of vectors
- 4) Professional presentation
  - The work (job) is clearly identified (problem, date, analyst)
  - Clear statement of each problem and its details and requirements
  - Logical layout of analysis
  - Clear statement of equations and theory used
  - Appropriate use of diagrams, clear diagrams, adequately labelled
  - 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

Scan your assignment and submit via the moodle course website

### Learning Outcomes Assessed

- Explain the basic concepts and principles of engineering mechanics
- Explain how engineering structures and components carry and transmit loads
- Analyse and determine:
  - o Properties of plane cross sections
  - o Forces acting in members of structures and assemblies in static equilibrium
  - o Normal stress and strain in members and components in static equilibrium
  - o Deflection of simple beams and trusses
  - o Stresses in circular shafts
  - o Principle stresses and maximum shear stresses using Mohr's circle
  - o Buckling behaviour of columns

- Explain the nature of engineering assumptions and explain commonly made assumptions and consequent limitations of the validity of analyses based on such assumptions
- Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development
- Formulate and solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems

### **Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy

## **2 Assignment 2**

### **Assessment Type**

Written Assessment

### **Task Description**

This assignment will assess the material from Weeks 1 to 8. Full assignment details are on the moodle course website.

### **Assessment Due Date**

Week 9 Monday (10 May 2021) 5:00 pm AEST

### **Return Date to Students**

Week 10 Monday (17 May 2021)

### **Weighting**

20%

### **Minimum mark or grade**

10/20

### **Assessment Criteria**

Your assignment will be assessed against four assessment criteria:

- 1) Accuracy and correct results
  - Correct application of maths and arithmetic
  - Answers clearly identified (please underline or highlight answers)
  - Correct results
- 2) Evidence of correct procedures
  - All necessary steps in analysis are present
  - Clear presentation of mathematical and arithmetical working linking the given details of the problem to the results obtained
  - Indication of the equations used when using spreadsheets (eg Microsoft Excel) or other software
  - Evidence of checking results (mathematical, graphical, logic-common sense)
- 3) Evidence of understanding of the topic
  - Explanation of any assumptions made
  - Explanation of choices made in the analysis (why is this procedure is required)
  - Interpretation of results, eg limitations, direction of vectors
- 4) Professional presentation
  - The work (job) is clearly identified (problem, date, analyst)
  - Clear statement of each problem and its details and requirements
  - Logical layout of analysis
  - Clear statement of equations and theory used
  - Appropriate use of diagrams, clear diagrams, adequately labelled
  - 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

Scan your assignment and submit via the moodle course website

## Learning Outcomes Assessed

- Explain the basic concepts and principles of engineering mechanics
- Explain how engineering structures and components carry and transmit loads
- Analyse and determine:
  - o Properties of plane cross sections
  - o Forces acting in members of structures and assemblies in static equilibrium
  - o Normal stress and strain in members and components in static equilibrium
  - o Deflection of simple beams and trusses
  - o Stresses in circular shafts
  - o Principle stresses and maximum shear stresses using Mohr's circle
  - o Buckling behaviour of columns
- Explain the nature of engineering assumptions and explain commonly made assumptions and consequent limitations of the validity of analyses based on such assumptions
- Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development
- Formulate and solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems

## Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy

## 3 Assignment 3

### Assessment Type

Written Assessment

### Task Description

This assignment will assess the material from Weeks 1 to 12. Full assignment details are on the moodle course website.

### Assessment Due Date

Exam Week Monday (14 June 2021) 5:00 pm AEST

### Return Date to Students

Assignment three will be returned after the CQU Certification of Grades.

### Weighting

50%

### Minimum mark or grade

20/50

### Assessment Criteria

Your assignment will be assessed against four assessment criteria:

- 1) Accuracy and correct results
  - Correct application of maths and arithmetic
  - Answers clearly identified (please underline or highlight answers)
  - Correct results
- 2) Evidence of correct procedures
  - All necessary steps in analysis are present
  - Clear presentation of mathematical and arithmetical working linking the given details of the problem to the results obtained
  - Indication of the equations used when using spreadsheets (eg Microsoft Excel) or other software
  - Evidence of checking results (mathematical, graphical, logic-common sense)
- 3) Evidence of understanding of the topic
  - Explanation of any assumptions made
  - Explanation of choices made in the analysis (why is this procedure is required)
  - Interpretation of results, eg limitations, direction of vectors
- 4) Professional presentation
  - The work (job) is clearly identified (problem, date, analyst)
  - Clear statement of each problem and its details and requirements
  - Logical layout of analysis
  - Clear statement of equations and theory used
  - Appropriate use of diagrams, clear diagrams, adequately labelled

- 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

Scan your assignment and submit via the moodle course website

### Learning Outcomes Assessed

- Explain the basic concepts and principles of engineering mechanics
- Explain how engineering structures and components carry and transmit loads
- Analyse and determine:
  - o Properties of plane cross sections
  - o Forces acting in members of structures and assemblies in static equilibrium
  - o Normal stress and strain in members and components in static equilibrium
  - o Deflection of simple beams and trusses
  - o Stresses in circular shafts
  - o Principle stresses and maximum shear stresses using Mohr's circle
  - o Buckling behaviour of columns
- Analyse failure of structures and components and determine fatigue lives of components
- Explain the nature of engineering assumptions and explain commonly made assumptions and consequent limitations of the validity of analyses based on such assumptions
- Communicate professionally and provide evidence of personal reflection on, and critical assessment of, team contributions and professional development
- Formulate and solve problems and record and communicate clearly and professionally the approach used to solve problems and the reasons for adopting such approaches to problems

### Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy

## 4 Workbook

### Assessment Type

Written Assessment

### Task Description

This task is in two parts:

#### 1) Weekly reflection:

A weekly reflection on your learning is required to be posted on the moodle course site. This is to include one sentence for each of the following questions. (Directions on how to post your reflections will be provided on the moodle course site.)

- What did you learn during the past week?
- How did you learn it?
- How do you think you could apply it, either now or later in your career?
- What did you find hard to understand?

#### 2) Workbook:

The Workbook provides a record and detailed diary of your learning and completed activities throughout the course. Preparation of a Workbook should be understood as good study technique. It also provides evidence that you have adequately studied the whole course and achieved the course learning outcomes. It is worthwhile doing a good attempt at the workbook as, if at the end of the course you are on the border line between two final grades the workbook can be used to determine if the higher grade should be awarded.

The Workbook is best handwritten and then scanned and submitted electronically. A handwritten Workbook is most appropriate and most time effective as the course involves many equations and diagrams. It is much quicker to write and sketch freehand. The presentation of the workbook is not as crucial as an assignment as it is recognised you will make mistakes during your learning. Rough sketches and partial attempts/re-attempts of questions are acceptable and may add to your grade. The start of each section of work should be dated and all pages should be numbered. It should be prepared week by week, not at the end of term. Show rough attempts at problems including failures and fixes, brainstorming, draft notes and developing ideas.

In the Workbook students must record:

- workbook activities you are asked to complete in the course notes

In the Workbook students may also record:

- study notes taken while studying textbooks and course resources
- personal study summaries of key concepts
- notes, sketches/ drawings
- initial attempts of assignment tasks

### **Workbook submission**

- A Workbook progress submission is required 1pm Monday Week 5. Just submit your workbook to date to enable the teaching team to provide some feedback to let you know how you are going on this task.

- The whole Workbook is due at the end of the term, the due date is shown in the course profile.

### **Assessment Due Date**

Week 5 Friday (9 Apr 2021) 11:45 pm AEST

This is for the first workbook submission.

### **Return Date to Students**

The workbook will be returned after the CQU Certification of Grades.

### **Weighting**

Pass/Fail

### **Minimum mark or grade**

Successful completion of this assessment is a requirement for passing this course.

### **Assessment Criteria**

#### **To pass this assessment you must:**

- make a legitimate attempt of at least 50% of the Workbook activities for each topic in the course notes.
- submit weekly reflections on the moodle course site. (To provide flexibility you are permitted to submit your reflections 1 week late past the due date to enable those on 7 or 10 day rosters to submit. One week after the reflection due date you will not be able to submit to that week so please add your late reflection in the following week's reflection and label it accordingly ie 'Week 4 reflection'. If you work ahead, feel free to submit reflections in that learning week's reflection submission activity.)

#### **Workbook activities guidelines:**

Workbook activities are set for each Topic and are detailed in the Course Study Guide. All workbook activities have a brief solution provided so that students can check their results. Do not copy the solutions provided and submit as your own work. The solutions provided are only basic and should not be seen as a complete solution. I suggest you first attempt the questions without looking at the solutions. If having difficulty, work through the provided solution and then re-attempt the question without looking at the solution. If still having difficulty you are encouraged to scan your work and post it on the moodle course website Q&A forum.

As mentioned in the task description the presentation and accuracy of results of the workbook activities are not as crucial as an assignment as it is recognised you will make mistakes during your learning. Rough sketches and partial attempts/re-attempts of questions are acceptable and may add to your grade. Workbook activities are seen as ways to stimulate your own learning rather than final work you would submit to a colleague. However there should be some attempt to set out and document your work to show your understanding. Set out and document the activities in a way you could revisit them at a later date if required. The following repeated assignment criteria will help guide the layout of your workbook activities but should not be viewed as rigid.

Accuracy and correct results

- Correct application of maths and arithmetic
- Answers clearly identified (please underline or highlight answers)
- Correct results

Evidence of correct procedures

- All necessary steps in analysis are present
- Clear presentation of mathematical and arithmetical working linking the given details of the problem to the results obtained
- Indication of the equations used when using spreadsheets (eg Microsoft Excel) or other software

- Evidence of checking results (mathematical, graphical, logic-common sense)

Evidence of understanding of the topic

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

Professional presentation

- The work (job) is clearly identified (problem, date, analyst)
- Clear statement of each problem and its details and requirements

- Logical layout of analysis
- Clear statement of equations and theory used
- Appropriate use of diagrams, clear diagrams, adequately labelled
- 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**

Scan your workbook and submit via the moodle course website

### **Learning Outcomes Assessed**

- Explain the basic concepts and principles of engineering mechanics
- Explain how engineering structures and components carry and transmit loads
- Analyse and determine:
  - o Properties of plane cross sections
  - o Forces acting in members of structures and assemblies in static equilibrium
  - o Normal stress and strain in members and components in static equilibrium
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- Analyse failure of structures and components and determine fatigue lives of components
- Explain the nature of engineering assumptions and explain commonly made assumptions and consequent limitations of the validity of analyses based on such assumptions
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### **Graduate Attributes**

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