



MECH2004

Mechanics of Solids

Session 1, Weekday attendance, North Ryde 2021

School of Engineering

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Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group activities on campus, and most will keep an online version available to those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

General Information

Unit convenor and teaching staff

Shaokoon Cheng

shaokoon.cheng@mq.edu.au

Contact via 98502234

44 Waterloo Road, Room 228

Tuesday (12pm to 2pm)

Credit points

10

Prerequisites

(MECH1001 or ENGG150) and (MATH1020 or MATH1025 or MATH136 or MATH133)

Corequisites

Co-badged status

Unit description

This unit examines the basic concepts of Mechanics of Solids. It covers knowledge in stress-strain relations and various types of engineering stresses. At the end of the unit, students are expected to demonstrate proficiencies in resolving problems that are related to statically indeterminate systems, shear stress, bending stress and torsional stress. Students are also expected to describe mechanical stresses and the deformation of complex loaded structures through bending moment diagrams, shear force diagrams and Mohr's circle theories.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

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

ULO1: Recall and outline the application and limitations of Solid Mechanics theories through the derivation of governing equations in the discipline.

ULO2: Apply fundamental theories in Mechanics of Materials to produce accurate numerical solutions.

ULO3: Analyse and dissect complex mechanical engineering system problems.

ULO4: Exercise the professional skills of self-learning, time-management, and project

management.

General Assessment Information

Grading and passing requirement for unit

In order to pass this unit, a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/ CR/ D/ HD).

For further details about grading, please refer below in the policies and procedures section.

Late submissions and Resubmissions

For assignments handed in late, the following penalties apply 0-48hrs: -50%, >48hrs: -100%. Extenuating circumstances will be considered upon lodgment of a formal notice of disruption of studies.

Additional information

Rubrics for all assessments are standards-based and will be made available on iLearn by week 1.

Tutorials commence in week 2.

There are only two lab practical and they are in week 9 and week 10.

Assessment Tasks

Name	Weighting	Hurdle	Due
Project	15%	No	Week 13 (Monday)
Assignment 2	8%	No	Week 11 (Friday)
Assignment 1	7%	No	Week 7 (Friday)
Laboratory report	10%	No	Week 12 (Friday)
Common quiz administered online	10%	No	Week 8
Examination	50%	No	TBA. Exam will be held in the formal exam period

Project

Assessment Type ¹: Presentation

Indicative Time on Task ²: 15 hours

Due: **Week 13 (Monday)**

Weighting: **15%**

This presentation will be held in week 13. All students are required to present an example of how theory of mechanics of materials can be effectively applied.

On successful completion you will be able to:

- Recall and outline the application and limitations of Solid Mechanics theories through the derivation of governing equations in the discipline.
- Analyse and dissect complex mechanical engineering system problems.
- Exercise the professional skills of self-learning, time-management, and project management.

Assignment 2

Assessment Type ¹: Problem set

Indicative Time on Task ²: 15 hours

Due: **Week 11 (Friday)**

Weighting: **8%**

This assignment will cover problems on analysis of beams under complex loading, Mohr circles theory, deflection, buckling of column and thin walled vessels.

On successful completion you will be able to:

- Recall and outline the application and limitations of Solid Mechanics theories through the derivation of governing equations in the discipline.
- Apply fundamental theories in Mechanics of Materials to produce accurate numerical solutions.
- Analyse and dissect complex mechanical engineering system problems.

Assignment 1

Assessment Type ¹: Problem set

Indicative Time on Task ²: 15 hours

Due: **Week 7 (Friday)**

Weighting: **7%**

This assignment will cover problems on statically indeterminate problems, centroid and moment of inertia, mechanical properties of materials, torsion and other stresses in beams.

On successful completion you will be able to:

- Recall and outline the application and limitations of Solid Mechanics theories through the derivation of governing equations in the discipline.
- Apply fundamental theories in Mechanics of Materials to produce accurate numerical solutions.
- Analyse and dissect complex mechanical engineering system problems.

Laboratory report

Assessment Type ¹: Lab report

Indicative Time on Task ²: 15 hours

Due: **Week 12 (Friday)**

Weighting: **10%**

This is an individual assignment and students are required to write up their observations and experimental data obtained from the laboratory experiments.

On successful completion you will be able to:

- Apply fundamental theories in Mechanics of Materials to produce accurate numerical solutions.
- Exercise the professional skills of self-learning, time-management, and project management.

Common quiz administered online

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 2 hours

Due: **Week 8**

Weighting: **10%**

The quiz will cover topics taught in the first 7 weeks of lecture.

On successful completion you will be able to:

- Recall and outline the application and limitations of Solid Mechanics theories through the derivation of governing equations in the discipline.
- Apply fundamental theories in Mechanics of Materials to produce accurate numerical solutions.
- Analyse and dissect complex mechanical engineering system problems.

Examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 3 hours

Due: **TBA. Exam will be held in the formal exam period**

Weighting: **50%**

This is a close book exam.

On successful completion you will be able to:

- Recall and outline the application and limitations of Solid Mechanics theories through the derivation of governing equations in the discipline.
- Apply fundamental theories in Mechanics of Materials to produce accurate numerical solutions.
- Analyse and dissect complex mechanical engineering system problems.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Mechanics of Materials in SI Units, 10th Edition

By Russell C. Hibbeler

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.s.mq.edu.au\)](https://policies.s.mq.edu.au). Students should be aware of the following policies in particular with regard to

Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies \(https://students.mq.edu.au/support/study/policies\)](https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.