MECH1001

Introduction to Mechanical Engineering

Session 1, In person-scheduled-weekday, North Ryde 2022

School of Engineering

Contents

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General Information

Unit convenor and teaching staff
Lecturer, Unit convenor
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9 Wally's Walk, Rm324
3-5pm Monday

Credit points
10

Prerequisites
(PHYS1510 or PHYS140) and (MATH135 or MATH132 or MATH1010 or MATH1015)

Corequisites

Co-badged status

Unit description
The unit introduces the broad field of Mechanical engineering concepts. It will cover
fundamental mechanics knowledge that is required to analyse forces in both static and
dynamic physical system and also to perform fundamental fluid mechanics analysis. At the
end of the unit, students are expected to demonstrate the ability to analyse and solve basic
mechanics problems fluently.

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: Perform structural analysis of three-dimensional machine frames and structures.

ULO2: Demonstrate proficiency in applying mathematical knowledge to solve
fundamental engineering dynamic problems.

ULO3: Solve problems in both static and dynamic systems.

ULO4: Demonstrate proficiency in the presentation of introductory level mechanical
engineering solutions.

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.

If you receive special consideration for the final exam, a supplementary exam will be scheduled by the faculty during a supplementary exam period, typically about 3 to 4 weeks after the normal exam period. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

Hurdle Requirement

The final examination is a hurdle requirement. A grade of 45% or more in the final examination is a condition of passing this unit. If you are given a second opportunity to sit the final examination as a result of failing to meet the minimum mark required, you will be offered that chance during the supplementary examination period and will be notified of the exact day and time after the publication of final results for the unit. The second attempt at a hurdle assessment is graded as pass fail. The maximum grade for a second attempt is the hurdle threshold grade.

Participation in workshop sessions is a hurdle requirement and students are required to attend at least 10/12 workshop sessions to pass this unit. Note that workshops will start in Week 1 and be held on campus. Students are requested to contact the convenor as soon as possible if they are unable to get back to campus in time.

Late submissions

Online quizzes, in-class activities, or scheduled tests and exam must be undertaken at the time indicated in the unit guide. Should these activities be missed due to illness or misadventure, students may apply for Special Consideration.

All other assessments must be submitted by 5:00 pm on their due date.

Should these assessments be missed due to illness or misadventure, students should apply for Special Consideration.

Assessments not submitted by the due date will receive a mark in accordance with the late submission policy as follows:

A 12-hour grace period will be given after which the following deductions will be applied to the awarded assessment mark: 12 to 24 hours late = 10% deduction; for each day thereafter, an

additional 10% per day or part thereof will be applied until five days beyond the due date. After this time, a mark of zero (0) will be given. For example, an assessment worth 20% is due 5 pm on 1 January. Student A submits the assessment at 1 pm, 3 January. The assessment received a mark of 15/20. A 20% deduction is then applied to the mark of 15, resulting in the loss of three (3) marks. Student A is then awarded a final mark of 12/20.

Resubmission of work is not allowed

Final Examinations

Final examinations will take place at the end of the semester. For further information, please refer to the Examination Timetable website on www.mq.edu.au

Assessment Tasks

Name	Weighting	Hurdle	Due
Assignments	10%	No	Week 6, Week 11
Online quiz	20%	No	Week 3, Week 7, Week 9, Week 12
Workshop Participation	20%	Yes	Every Week
Final Exam	50%	Yes	TBA

Assignments

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 16 hours
Due: **Week 6, Week 11**
Weighting: **10%**

There will be two assignments, each worth 5%. A portion of the available grades will be awarded for presentation of work. Markers WILL NOT grade poorly organized or illegible scans or drafts. Well presented work is highly legible, annotated, well structured, and presented with page numbers and student IDs on every page.

On successful completion you will be able to:

• Perform structural analysis of three-dimensional machine frames and structures.

• Demonstrate proficiency in applying mathematical knowledge to solve fundamental

engineering dynamic problems.

- Solve problems in both static and dynamic systems.
- Demonstrate proficiency in the presentation of introductory level mechanical engineering solutions.

Online quiz

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 24 hours
Due: **Week 3, Week 7, Week 9, Week 12**
Weighting: **20%**

There will be four online quizzes, each worth 5%. The quiz will be open for a specific time and all students must take the quiz during that time. All students are to ensure that they have their own resources (Computers, tablet, smart phone etc) to take part in the quiz.

On successful completion you will be able to:

- Perform structural analysis of three-dimensional machine frames and structures.
- Demonstrate proficiency in applying mathematical knowledge to solve fundamental engineering dynamic problems.
- Solve problems in both static and dynamic systems.
- Demonstrate proficiency in the presentation of introductory level mechanical engineering solutions.

Workshop Participation

Assessment Type [1]: Quantitative analysis task
Indicative Time on Task [2]: 12 hours
Due: **Every Week**
Weighting: **20%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

This is a hurdle assessment task. 12 workshop sessions are run to assess and assist student learning and deepen engagement. Workshop session will not run in Week 1. Participation in at least 10 workshop sessions is required to pass the unit.

On successful completion you will be able to:

- Perform structural analysis of three-dimensional machine frames and structures.
- Demonstrate proficiency in applying mathematical knowledge to solve fundamental engineering dynamic problems.
- Solve problems in both static and dynamic systems.
- Demonstrate proficiency in the presentation of introductory level mechanical engineering solutions.

Final Exam

Assessment Type [1]: Examination
Indicative Time on Task [2]: 20 hours
Due: **TBA**
Weighting: **50%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

This is a hurdle assessment task. The final exam will be hurdle assessment task testing mechanical concepts.

On successful completion you will be able to:

- Perform structural analysis of three-dimensional machine frames and structures.
- Demonstrate proficiency in applying mathematical knowledge to solve fundamental engineering dynamic problems.
- Solve problems in both static and dynamic systems.
- Demonstrate proficiency in the presentation of introductory level mechanical engineering solutions.

[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

Text books:

"Vector Mechanics for Engineers: Statics and Dynamics 12th Edition", by Beer, Johnston, Mazurek, Cornwell and Self

Resources Required:

You must bring a log book to workshop sessions. Tutors will only mark solutions written into this log book. You should obtain a quality scientific calculator and be familiar with its use.

Unit Schedule

Refer to iLearn and lecture notes for the unit schedule.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.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
- Assessment Procedure
- Complaints Resolution 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). 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) 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

Academic Integrity

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and

courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing and maths support, academic skills development and wellbeing consultations.

Student Support

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

The Writing Centre

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- Access StudyWISE
- Upload an assignment to Studiosity
- Complete the 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

Macquarie University offers a range of Student Support Services including:

- IT Support
- Accessibility and disability support with study
- Mental health support
- Safety support to respond to bullying, harassment, sexual harassment and sexual assault
- Social support including information about finances, tenancy and legal issues

Student Enquiries

Got a question? Ask us via AskMQ, or contact Service Connect.

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.

Engineers Australia Competency Mapping

EA Competency Standard		Unit Learning Outcomes
Knowledge and Skill Base	1.1 Comprehensive, theory-based understanding of the underpinning fundamentals applicable to the engineering discipline.	ULO2, ULO3
	1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing.	ULO1, ULO2, ULO3
	1.3 In-depth understanding of specialist bodies of knowledge	
	1.4 Discernment of knowledge development and research directions	
	1.5 Knowledge of engineering design practice	
	1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice.	
Engineering Application Ability	2.1 Application of established engineering methods to complex problem solving	ULO1, ULO3
	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.	
Professional and Personal Attributes	3.1 Ethical conduct and professional accountability.	
	3.2 Effective oral and written communication in professional and lay domains.	ULO4
	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.	