



MECH4093

Mechanical Engineering Research Thesis B

Session 1, In person-scheduled-weekday, North Ryde 2023

School of Engineering

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General Information

Unit convenor and teaching staff

Unit Convenor

Hazer Inaltekin

hazer.inaltekin@mq.edu.au

Contact via 9850 2280

44 WTR, Room 133

Tuesday 5pm-6pm

Credit points

10

Prerequisites

30cp at 4000 level including MECH4092

Corequisites

Co-badged status

Unit description

In this unit students will conduct the second half of their individual research thesis on a topic in the Mechanical Engineering specialisation under the direction of an academic supervisor. Students will implement the previously developed project plan, continuing the experimental and theoretical work to obtain results and analysis presented in the form of a final research thesis.

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: Undertake a complex engineering-specific research project.

ULO2: Develop new knowledge, using appropriate technical and/or laboratory skills, data management and synthesis, critical analysis and interpretation of results.

ULO3: Communicate research results through an effective written dissertation and oral presentation to a variety of audiences in research fora.

ULO4: Produce technical writing and presentations at a standard that would be acceptable in a professional engineering workplace.

ULO5: Identify, formulate and solve complex open-ended Mechanical Engineering problems in an ethical manner.

ULO6: Apply research principles, research methods, and technical standards to identify and provide solutions to complex problems in Mechanical Engineering.

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.

Hurdle Requirements

The Preliminary Thesis is a hurdle requirement. A grade of 50% or more on the Preliminary Thesis is a condition of passing this unit. If you are given a second opportunity to submit your thesis as a result of failing to meet the minimum mark required, your submission will be due during the supplementary examination period and will be notified of the exact day and time by the unit convenor. The second attempt at a hurdle assessment is graded as pass fail. The maximum grade for a second attempt is the hurdle threshold grade.

Regular meetings with thesis supervisor is a hurdle requirement. Students are required to attend at least 6 out of 12 weekly meetings from Week 1 to Week 12. See details in assessment task description.

Late submissions and Re-submissions

All assessments must be submitted by 23:59pm (Sydney Time) on their due date. Should the activities be missed due to illness or misadventure, students may apply for Special Consideration, as detailed below.

- **Thesis Report:** Late penalty applies unless there is an approved special consideration request. Resubmissions are not allowed.
- **Presentation:** Late submissions are not allowed unless there is an approved special consideration request. Special considerations for presentations are approved only if there are long delays due to extenuating circumstances. Resubmissions are not allowed.
- **Logbooks (Management and Engagement):** Late penalty applies unless there is an approved special consideration request. Resubmissions are not allowed.

Project Implementation

If your project requires on-campus lab attendance and you are not able to get back to campus on time, please contact with the unit convenor and your supervisor as soon as possible.

Assessment Tasks

Name	Weighting	Hurdle	Due
Project Management	10%	No	Week 13
Research Plan	0%	Yes	All Weeks
Presentation	20%	No	Week 14-16
Thesis	70%	Yes	Week 13

Project Management

Assessment Type ¹: Log book

Indicative Time on Task ²: 10 hours

Due: **Week 13**

Weighting: **10%**

This assessment is made by the student's supervisor. It is comprised of the supervisor's judgement of self-management, engagement, intellectual independence, initiative, as well as judgement of the quality of record keeping & written log book. The logbook should contain dated records of day-to-day activities associated with the project.

On successful completion you will be able to:

- Undertake a complex engineering-specific research project.
- Develop new knowledge, using appropriate technical and/or laboratory skills, data management and synthesis, critical analysis and interpretation of results.
- Communicate research results through an effective written dissertation and oral presentation to a variety of audiences in research fora.
- Produce technical writing and presentations at a standard that would be acceptable in a professional engineering workplace.
- Identify, formulate and solve complex open-ended Mechanical Engineering problems in an ethical manner.
- Apply research principles, research methods, and technical standards to identify and provide solutions to complex problems in Mechanical Engineering.

Research Plan

Assessment Type ¹: Plan

Indicative Time on Task ²: 5 hours

Due: **All Weeks**

Weighting: **0%**

This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)

In this unit, development of knowledge and skills will be guided by regular interaction with your supervisor. You are strongly recommended to meet with your supervisor on a weekly basis, once the project commences. Weekly meetings should aim to seek feedback and steer the project, and would normally last at least 15-30 minutes or more. Meetings can be conducted using telephone or video-conference. Outcomes of a minimum of six meetings must be documented using the meeting log sheet provided on iLearn to meet this hurdle assessment task.

On successful completion you will be able to:

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- Produce technical writing and presentations at a standard that would be acceptable in a professional engineering workplace.
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Presentation

Assessment Type ¹: Presentation

Indicative Time on Task ²: 10 hours

Due: **Week 14-16**

Weighting: **20%**

Students are required to deliver a comprehensive oral presentation about their project outcomes at the end of the unit.

On successful completion you will be able to:

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- Communicate research results through an effective written dissertation and oral presentation to a variety of audiences in research fora.
- Produce technical writing and presentations at a standard that would be acceptable in a professional engineering workplace.
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Thesis

Assessment Type ¹: Thesis

Indicative Time on Task ²: 50 hours

Due: **Week 13**

Weighting: **70%**

This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)

Students are required to prepare a thesis report about their projects, including the literature review, technical execution of the project, discussion and understanding of results, and conclusions and added value of work.

On successful completion you will be able to:

- Undertake a complex engineering-specific research project.
- Develop new knowledge, using appropriate technical and/or laboratory skills, data management and synthesis, critical analysis and interpretation of results.
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- Produce technical writing and presentations at a standard that would be acceptable in a professional engineering workplace.
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- Apply research principles, research methods, and technical standards to identify and provide solutions to complex problems in Mechanical Engineering.

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

Unit Delivery

This is a project-based unit and has no scheduled lectures or tutorial sessions. Special lectures may be organised and related announcements will be made via iLearn.

Logbook

This unit requires a logbook. The students should maintain an individual logbook which should contain a dated log of day-to-day activities undertaken in relation to the project.

Technology Used and Required

The students are required to discuss with their supervisor about the software/hardware resources required for analysis, simulation, testing and experiments related to their project. In addition, word processing software (MS Word, Latex etc.) will be required to produce the preliminary thesis and MS PowerPoint or equivalent software will be required for presentation slides.

Unit Webpage

Access from the online iLearn System at <http://ilearn.mq.edu.au>

Required and Recommended Texts/Materials

There is not set textbook for this unit. The students are required to discuss with their supervisor regarding required/recommended reading materials, as suited to individual project needs.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](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 \(https://students.mq.edu.au/support/study/policies\)](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

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 Advocacy](#) provides independent advice on MQ policies, procedures, and processes

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.	
	1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing.	
	1.3 In-depth understanding of specialist bodies of knowledge	
	1.4 Discernment of knowledge development and research directions	ULO1, ULO2
	1.5 Knowledge of engineering design practice	

	1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice.	ULO6
Engineering Application Ability	2.1 Application of established engineering methods to complex problem solving	ULO5, ULO6
	2.2 Fluent application of engineering techniques, tools and resources.	ULO2, ULO5, ULO6
	2.3 Application of systematic engineering synthesis and design processes.	ULO2
	2.4 Application of systematic approaches to the conduct and management of engineering projects.	ULO1
Professional and Personal Attributes	3.1 Ethical conduct and professional accountability.	ULO4, ULO5
	3.2 Effective oral and written communication in professional and lay domains.	ULO3, ULO4
	3.3 Creative, innovative and pro-active demeanour.	
	3.4 Professional use and management of information.	ULO2, ULO4
	3.5 Orderly management of self, and professional conduct.	ULO3
	3.6 Effective team membership and team leadership	