



ENGG8990

Master of Research - Engineering

Session 2, In person-scheduled-weekday, North Ryde 2024

School of Engineering

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General Information

Unit convenor and teaching staff

MRes Advisor

Binesh Puthen Veettil

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Contact via x9190

251, 3-Management Drive

Mon 4pm-6pm

Credit points

80

Prerequisites

Corequisites

Co-badged status

Unit description

The 800-level components of the Master of Research are not designed around units. The thesis together with four core research activities form a single coherent research unit based on individual research plans and will consist of the followings:

1. Research Frontiers: you will attend a number of school or faculty-run sessions and engage in a program of activities developing your knowledge of the sub-disciplinary field in which you want to situate your own research
2. Literature Review: you will attend sessions explaining how researchers in your field engage with previous research literature, and produce a draft of your own literature review for your thesis
3. Research Methods: with other students and led by academic staff, you will develop the research methods you will use in your research project
4. Research Planning: through a combination of group sessions and individual work with your supervision team, you will develop a plan for a large scale research project, part of which will be completed in the MRes
5. Thesis: you will complete a small research project, and write it up in a short thesis of about 20,000 words.

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:** Apply advanced knowledge and skills to plan, undertake and complete distinct research projects using appropriate research methods aligned to complex and novel research questions within their field or discipline
- ULO2:** apply critical and integrative thinking to problems, concepts and theories within their disciplinary field through scholarly investigation of currently available evidence
- ULO3:** demonstrate problem solving skills and creativity through their ability to apply existing knowledge and produce new knowledge in innovative ways to enhance their field or discipline and deliver significant benefits to the broader community
- ULO4:** be effective and coherent communicators to both specialist and non-specialist audiences, and demonstrate high-level discipline-specific research and technical skills
- ULO5:** be future focused and adaptable, demonstrating critical thinking and analytical skills to synthesise and advance the knowledge base of their discipline
- ULO6:** be socially and culturally responsive researchers, who collaborate effectively with industry, community and their broader disciplinary field
- ULO7:** demonstrate a deep knowledge of, and apply expert judgement on, contemporary local and/or global disciplinary issues
- ULO8:** demonstrate an understanding of complex research systems to effectively develop impactful solutions to global problems
- ULO9:** be responsible ethical and reflective researchers able to work independently and lead and collaborate within teams to enhance disciplinary knowledge to the benefit of individuals and communities
- ULO10:** demonstrate an independent ability to apply their knowledge and skills as ethically responsible and reflective autonomous researchers committed to lifelong learning and discovery to advance their disciplinary field

General Assessment Information

Late Assessment Submission

Students will have to submit a special consideration request for your late submission to be assessed. Submission time for all written assessments is set at **11:55 pm**. A 1-hour grace period is provided to students who experience a technical concern.

Assessments where Late Submissions will be accepted

In this unit, late submissions will be accepted as follows:

- Literature Review submission - NO, unless special consideration is granted
- Research Planning submission- NO, unless special consideration is granted.
- Research Method submission - NO, unless special consideration is granted.
- Poster submission- NO, unless special consideration is granted.
- Thesis- Yes, Marks will be deducted for each late day. Refer to GRA's MRes guide provided on iLearn for more details.

Assessment Tasks

Name	Weighting	Hurdle	Due
Literature review	0%	Yes	30/8/2024 (check iLearn for details)
Poster	10%	No	30/1/2025 (check iLearn for details)
Research planning	0%	Yes	30/10/2024 (Check iLearn for details)
Research Methods	0%	Yes	30/11/2024 (check iLearn for details)
Thesis	90%	Yes	EWS date (check your offer letter)

Literature review

Assessment Type ¹: Literature review

Indicative Time on Task ²: 20 hours

Due: **30/8/2024 (check iLearn for details)**

Weighting: **0%**

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

You will collate and understand the background literature for your chosen project and to produce a written report which will be part of your thesis.

On successful completion you will be able to:

- Apply advanced knowledge and skills to plan, undertake and complete distinct research projects using appropriate research methods aligned to complex and novel research questions within their field or discipline
- apply critical and integrative thinking to problems, concepts and theories within their

- disciplinary field through scholarly investigation of currently available evidence
- demonstrate problem solving skills and creativity through their ability to apply existing knowledge and produce new knowledge in innovative ways to enhance their field or discipline and deliver significant benefits to the broader community
- be effective and coherent communicators to both specialist and non-specialist audiences, and demonstrate high-level discipline-specific research and technical skills
- be future focused and adaptable, demonstrating critical thinking and analytical skills to synthesise and advance the knowledge base of their discipline
- demonstrate a deep knowledge of, and apply expert judgement on, contemporary local and/or global disciplinary issues
- demonstrate an understanding of complex research systems to effectively develop impactful solutions to global problems
- be responsible ethical and reflective researchers able to work independently and lead and collaborate within teams to enhance disciplinary knowledge to the benefit of individuals and communities
- demonstrate an independent ability to apply their knowledge and skills as ethically responsible and reflective autonomous researchers committed to lifelong learning and discovery to advance their disciplinary field

Poster

Assessment Type ¹: Poster

Indicative Time on Task ²: 20 hours

Due: **30/1/2025 (check iLearn for details)**

Weighting: **10%**

You will present a poster related to your thesis research.

On successful completion you will be able to:

- Apply advanced knowledge and skills to plan, undertake and complete distinct research projects using appropriate research methods aligned to complex and novel research questions within their field or discipline
- apply critical and integrative thinking to problems, concepts and theories within their disciplinary field through scholarly investigation of currently available evidence
- demonstrate problem solving skills and creativity through their ability to apply existing knowledge and produce new knowledge in innovative ways to enhance their field or

discipline and deliver significant benefits to the broader community

- be effective and coherent communicators to both specialist and non-specialist audiences, and demonstrate high-level discipline-specific research and technical skills
- be socially and culturally responsive researchers, who collaborate effectively with industry, community and their broader disciplinary field

Research planning

Assessment Type ¹: Plan

Indicative Time on Task ²: 14 hours

Due: **30/10/2024 (Check iLearn for details)**

Weighting: **0%**

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

You will receive training in project management, and planning of a major research project. You will submit a brief project plan & budget.

On successful completion you will be able to:

- Apply advanced knowledge and skills to plan, undertake and complete distinct research projects using appropriate research methods aligned to complex and novel research questions within their field or discipline
- be effective and coherent communicators to both specialist and non-specialist audiences, and demonstrate high-level discipline-specific research and technical skills

Research Methods

Assessment Type ¹: Participatory task

Indicative Time on Task ²: 20 hours

Due: **30/11/2024 (check iLearn for details)**

Weighting: **0%**

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

You will demonstrate your understanding and skills in appropriate research methodologies, and that you are able to critically analyse their use in comparison with alternative methods.

On successful completion you will be able to:

- Apply advanced knowledge and skills to plan, undertake and complete distinct research projects using appropriate research methods aligned to complex and novel research questions within their field or discipline
- demonstrate problem solving skills and creativity through their ability to apply existing knowledge and produce new knowledge in innovative ways to enhance their field or discipline and deliver significant benefits to the broader community
- be effective and coherent communicators to both specialist and non-specialist audiences, and demonstrate high-level discipline-specific research and technical skills
- be future focused and adaptable, demonstrating critical thinking and analytical skills to synthesise and advance the knowledge base of their discipline
- demonstrate a deep knowledge of, and apply expert judgement on, contemporary local and/or global disciplinary issues
- demonstrate an independent ability to apply their knowledge and skills as ethically responsible and reflective autonomous researchers committed to lifelong learning and discovery to advance their disciplinary field

Thesis

Assessment Type ¹: Thesis

Indicative Time on Task ²: 200 hours

Due: **EWS date (check your offer letter)**

Weighting: **90%**

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

You will complete an individual research project, for which you will write a single coherent [thesis](#) which is examined externally.

On successful completion you will be able to:

- Apply advanced knowledge and skills to plan, undertake and complete distinct research projects using appropriate research methods aligned to complex and novel research questions within their field or discipline
- apply critical and integrative thinking to problems, concepts and theories within their disciplinary field through scholarly investigation of currently available evidence
- demonstrate problem solving skills and creativity through their ability to apply existing knowledge and produce new knowledge in innovative ways to enhance their field or discipline and deliver significant benefits to the broader community

- be effective and coherent communicators to both specialist and non-specialist audiences, and demonstrate high-level discipline-specific research and technical skills
 - be future focused and adaptable, demonstrating critical thinking and analytical skills to synthesise and advance the knowledge base of their discipline
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 - demonstrate an independent ability to apply their knowledge and skills as ethically responsible and reflective autonomous researchers committed to lifelong learning and discovery to advance their disciplinary field
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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

The MRes Year 2 program provides a structured approach to guide you and your supervisor through an individual research project. Your year will incorporate a number of steps and milestones, all designed to directly assist with the initiation and implementation of a successful Higher Degree research project and submission of a well-written thesis

This is a self-directed research project unit. Candidates are expected to find their own resources through literature survey, discussion with their supervisors and experts and by attending workshops and conferences.

Unit Schedule

Unit schedule varies for full time and part time students. More information will be provided on

iLearn.

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.

Changes from Previous Offering

No changes from the previous offering

Engineers Australia Competency Mapping (custom)

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	1-10
	1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing	3,5,6,7
	1.3 In-depth understanding of specialist bodies of knowledge	1,3,5,9
	1.4 Discernment of knowledge development and research directions	7,8,10
	1.5 Knowledge of engineering design practice	9,10
	1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice	1,2,3,4
Engineering Application Ability	2.1 Application of established engineering methods to complex problem solving	5,6
	2.2 Fluent application of engineering techniques, tools and resources	5,6
	2.3 Application of systematic engineering synthesis and design process	4,5,6
	2.4 Application of systematic approaches to the conduct and management of engineering projects	1,2,3
Professional and Personal Attributes	3.1 Ethical conduct and professional accountability	6
	3.2 Effective oral and written communication in professional lay domains	4,5
	3.3 Creative, innovative and pro-active demeanour	4,5,6,10
	3.4 Professional use and management of information	
	3.5 Orderly management of self, and professional conduct	5,10
	3.6 Effective team membership and team leadership	10

Unit information based on version 2024.02 of the [Handbook](#)