



MTRN8068

Wireless Mechatronics

Session 2, In person-scheduled-weekday, North Ryde 2026

School of Engineering

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General Information

Unit convenor and teaching staff

Lecturer

Subhas Mukhopadhyay

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Contact via email

9WW 2138

Friday 10:00am to 12:00pm

Credit points

10

Prerequisites

40cp at 6000 level or above including MTRN6026

Corequisites

Co-badged status

Unit description

In the era of rapid technological advancement, particularly with the emergence of the Internet of Things (IoT), microelectromechanical systems (MEMS), and intelligent sensors and actuators, the development of wireless mechatronic devices, services, and systems is gaining significant traction across various domains like manufacturing, transportation, and healthcare. This unit provides a comprehensive study of both the theoretical and practical aspects involved in the design of wireless mechatronic systems. This encompasses the integration of smart actuators, sensors, interfacing electronics, embedded controllers, wireless communication protocols, and security measures, all coupled with the incorporation of adaptive intelligence, including machine learning techniques.

Learning in this unit enhances your understanding of global challenges identified by the United Nations Sustainable Development Goals ([UNSDGs](#)) Quality Education; Affordable and Clean Energy; Industry, Innovation and Infrastructure; Sustainable Cities and Communities

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: Implement wireless mechatronics systems including smart sensors, actuators and wireless communicating devices in the context of wireless mechatronics

ULO2: Apply advanced knowledge of data storage, security and cloud computing in the context of wireless mechatronics.

ULO3: Design and implement software for wireless mechatronics systems

ULO4: Design and implement systems for remote monitoring and control

ULO5: Design, implement and analyse of a project configured around the principle of wireless mechatronics

ULO6: Exhibit adeptness in communication and collaboration through skillful conveyance and exchange of ideas, utilizing verbal, written, and digital methods in a professional context.

General Assessment Information

Release: Marks of Assignment 1 will be released no later than week 5.

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.

Late Assessment Submission Penalty:

On line quizzes, in-class activities or schedule tests and exam must be undertaken at the time indicated in the unit guide. Should either of these assessments be missed due to illness or misadventure, students should apply for Special Consideration.

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark of the task) will be applied for each day a written report or presentation assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. The submission time for all uploaded assessments is 11:55 pm. A 1-hour grace period will be provided to students who experience technical concerns. For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, please apply for Special Consideration. For example, if the assignment is worth 8 marks (of the entire unit) and your submission is late by 19 hours (or 23 hours 59 minutes 59 seconds), 0.4 marks (5% of 8 marks) will be deducted. If your submission is late by 24 hours (or 47 hours 59 minutes 59 seconds), 0.8 marks (10% of 8 marks) will be deducted, and so on.

Resubmissions of work are not allowed.

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
Log book	40%	No	06/11/2026	Individual	No	Observed

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
<u>Mid-term test</u>	10%	No	21-08-2026	Individual	No	Observed
<u>Project Demonstration/Presentation</u>	50%	No	06/11/2026	Individual and Group	No	Observed

Log book

Assessment Type ¹: Written Submission

Indicative Time on Task ²: 40 hours

Due: **06/11/2026**

Weighting: **40%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

You will document practical activities delivered during classes and report them your log book. Your log book will also contain responses to weekly tasks.

On successful completion you will be able to:

- Implement wireless mechatronics systems including smart sensors, actuators and wireless communicating devices in the context of wireless mechatronics
- Apply advanced knowledge of data storage, security and cloud computing in the context of wireless mechatronics.
- Design and implement software for wireless mechatronics systems
- Design and implement systems for remote monitoring and control
- Design, implement and analyse of a project configured around the principle of wireless mechatronics

Mid-term test

Assessment Type ¹: Examination

Indicative Time on Task ²: 20 hours

Due: **21-08-2026**

Weighting: **10%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

You will complete a test based on content delivered in the early part of the session. Please refer to ilearn for further information.

On successful completion you will be able to:

- Implement wireless mechatronics systems including smart sensors, actuators and wireless communicating devices in the context of wireless mechatronics
- Apply advanced knowledge of data storage, security and cloud computing in the context of wireless mechatronics.
- Design and implement software for wireless mechatronics systems

Project Demonstration/Presentation

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 38 hours

Due: **06/11/2026**

Weighting: **50%**

Groupwork/Individual: Individual and Group

Short extension ³: No

AI Approach: Observed

You will demonstrate the final outcome of the project. The demonstration will enable for both individual and group contributions to be assessed. You will clearly demonstrate your individual contribution along with the group performance.

On successful completion you will be able to:

- Implement wireless mechatronics systems including smart sensors, actuators and wireless communicating devices in the context of wireless mechatronics
- Apply advanced knowledge of data storage, security and cloud computing in the context of wireless mechatronics.
- Design and implement software for wireless mechatronics systems
- Design and implement systems for remote monitoring and control
- Design, implement and analyse of a project configured around the principle of wireless mechatronics
- Exhibit adeptness in communication and collaboration through skillful conveyance and exchange of ideas, utilizing verbal, written, and digital methods in a professional context.

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
- [Academic Success](#) 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.

³ An automatic short extension is available for some assessments. Apply through the [Service](#)

[Connect Portal.](#)

Delivery and Resources

We will communicate with you via your university email and through announcements on iLearn. Queries to convenors can either be placed on the iLearn discussion board or sent to the unit convenor via the contact email on iLearn.

The lecture will start from Week#1. The lecture will be F2F.

The practical activities will also start from Week#1. The pracs activities will be held at 9WW 149.

The details will be uploaded in iLearn.

Unit Schedule

Tentative plan for the unit delivery

MTRN8068- Wireless Mechatronics

Week#1	Introduction to Wireless Mechatronics, Unit Introduction, Assessments, and a Guest Lecture	Subhas
Week#2	Speed Control of car and Sensing of parameters	Subhas
Week#3	Mobile Robot and Kinematics	Shadman
Week#4	Projects on Wireless Mechatronics (Report)	Subhas
Week#5	Actuators for Wireless Mechatronics	Subhas
Week#6	Communication for Wireless Mechatronics Systems	Subhas
Week#7	Powering and Thermal Design for Wireless Mechatronics	Subhas
Week#8	AI and ML in Wireless Mechatronics, especially in the context of Drones	Alice/Avishkar
Week#9	Wireless Protocols	Subhas
Week#10	Wireless Security	Subhas
Week#11	Guest Lecture	To be decided
Week#12	Design Consideration of WM System	Subhas

Week#13	Review of the unit	Subhas
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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 connect.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/>

Academic Success

[Academic Success](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Ask a Study Coach](#)
- [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 the [Service Connect Portal](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit <https://students.mq.edu.au/support/technology/service-desk>.

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

The time duration and method of delivery will be different for this year.

The pracs activities have been reduced to 2 hours from 4 hours in 2025. The hands-on pracs activities will be after the lecture so that the student will know background theory covered during the lecture.

The UC will discuss related theories for the project execution during the lecture, some of which are to be noted in the logbook.

The total time for the pracs and lecture activities is 4 hours compared to 6 hours for the previous years.

EA Competency Standard

EA Competency Standard

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
	1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing.	
	1.3 In-depth understanding of specialist bodies of knowledge	1,2,3,4
	1.4 Discernment of knowledge development and research directions	2
	1.5 Knowledge of engineering design practice	4
	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	2,3
	2.2 Fluent application of engineering techniques, tools and resources.	2,3,4
	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.	4
	3.2 Effective oral and written communication in professional and lay domains.	1,2
	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.	4
	3.6 Effective team membership and team leadership	

Unit information based on version 2026.03 of the [Handbook](#)