



MTRN4068

Wireless Mechatronics

Session 2, In person-scheduled-weekday, North Ryde 2022

School of Engineering

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General Information

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Unit convenor and lecturer

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Credit points

10

Prerequisites

(MTRN3026 or ELEC326) and (ELEC3024 or ELEC324)

Corequisites

Co-badged status

Unit description

With the advancement of Internet of Things (IoT), microelectromechanical systems (MEMS), smart sensors and actuators, wireless mechatronic devices, services, and systems are experiencing fast growth in a variety of application fields, such as manufacturing, transportation, and healthcare. This unit deals on the theory and practice of designing wireless mechatronic systems using smart actuators, sensors, Interfacing, embedded controller, wireless protocols with adaptive intelligence.

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: Demonstrate a good understanding 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

General Assessment Information

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).

Test#3 is equivalent to Final Examination.

You must attend and participate in at least 11 of the 13 weekly practical classes to pass this unit. This is a hurdle requirement.

Participation in tutorial/practical sessions is a hurdle requirement and students are required to attend at least 11 out of 13 sessions to pass this unit.

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.

Late Assessment Submission

Late assessments are not accepted in this unit unless a [Special Consideration](#) has been submitted and approved.

Assessment Tasks

Name	Weighting	Hurdle	Due
Practical activity	10%	No	Week 3
Test#3	30%	No	TBA
Test#2	20%	No	Week 6, 8 and 10

Name	Weighting	Hurdle	Due
Test#1	10%	No	Week 4
Practical Project	10%	No	Week 13
Review of wireless mechatronics system	10%	No	Week 2
Practical project	10%	No	Week 13

Practical activity

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 8 hours

Due: **Week 3**

Weighting: **10%**

The students will be involved in a practical activity. This will be due on Week#3.

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
- Demonstrate a good understanding 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

Test#3

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 20 hours

Due: **TBA**

Weighting: **30%**

The Test#3 will be similar like the Final examination and will be held on Week#14

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

- Demonstrate a good understanding 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

Test#2

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 10 hours

Due: **Week 6, 8 and 10**

Weighting: **20%**

The 2nd test on taught topics, will be held on Week#8

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
- Demonstrate a good understanding of data storage, security and cloud computing in the context of wireless mechatronics

Test#1

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 6 hours

Due: **Week 4**

Weighting: **10%**

The first Test will be held on Week#4

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
- Demonstrate a good understanding of data storage, security and cloud computing in the context of wireless mechatronics

Practical Project

Assessment Type ¹: Design Implementation

Indicative Time on Task ²: 8 hours

Due: **Week 13**

Weighting: **10%**

The final assessment of the project

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
- Demonstrate a good understanding 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

Review of wireless mechatronics system

Assessment Type ¹: Literature review

Indicative Time on Task ²: 12 hours

Due: **Week 2**

Weighting: **10%**

The students will study some wireless mechatronics systems and choose one paper to discuss about the strength, weaknesses, challenges and improvements

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
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- Design and implement software for wireless mechatronics systems
- Design and implement systems for remote monitoring and control

Practical project

Assessment Type ¹: Design Implementation

Indicative Time on Task ²: 8 hours

Due: **Week 13**

Weighting: **10%**

The design and implementation of the practical project

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
- Demonstrate a good understanding 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

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 teaching materials, pracs guidelines and recorded content for the unit will be uploaded in 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 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

The pracs activities will be hands-on and the students will work on a project based activity, the idea is to develop a self-driving car with avoiding obstacles and mapping the environment.

Engineers Australia Competency Mapping

Add a **custom section called "Engineers Australia Competency Mapping"**. Into that section paste this table and add unit learning outcomes in the appropriate plates (last column).

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
	1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing.	#1
	1.3 In-depth understanding of specialist bodies of knowledge	#2, #3

	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.	#3
Engineering Application Ability	2.1 Application of established engineering methods to complex problem solving	#3, #4
	2.2 Fluent application of engineering techniques, tools and resources.	#1, #2
	2.3 Application of systematic engineering synthesis and design processes.	#2
	2.4 Application of systematic approaches to the conduct and management of engineering projects.	#1
Professional and Personal Attributes	3.1 Ethical conduct and professional accountability.	#2
	3.2 Effective oral and written communication in professional and lay domains.	#4
	3.3 Creative, innovative and pro-active demeanour.	#2
	3.4 Professional use and management of information.	#2, #3
	3.5 Orderly management of self, and professional conduct.	#4
	3.6 Effective team membership and team leadership	#3

Engineers Australia Competency Mapping