



COMP8296

Artificial Intelligence and Machine Learning Techniques in IoT

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

School of Computing

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General Information

Unit convenor and teaching staff

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Contact via Contact via email

Room 359, 4 RPD

Wednesday 11-1 PM

Credit points

10

Prerequisites

COMP6200

Corequisites

Co-badged status

Unit description

There has been a phenomenal increase in both the number of things connected to the internet of things and, data generated by these devices. The extensive volume of data that these devices generate, the diverse data that comes into an IoT system, and the velocity at which data is captured and collected by these devices create a unique set of challenges in terms of storage and processing requirements, and analytics for enterprises. This unit will discuss technologies and applications of how AI/ML techniques can be applied to augment the intelligence and the capabilities of IoT systems and applications. The unit will investigate various AI/ML algorithms and techniques that help to discover and demystify hidden patterns within large data sets in various levels of a large-scale IoT infrastructure. The unit will classify the different AI/ML algorithms used to handle IoT data in various IoT-based industry sectors such as health and manufacturing and will examine them in some detail. The unit will examine how resource constraints on small IoT devices affect the implementation of AI/ML algorithms.

Learning in this unit enhances student understanding of global challenges identified by the United Nations Sustainable Development Goals ([UNSDGs](#)) Industry, Innovation and Infrastructure

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: Analyze the role of Artificial Intelligence and Machine Learning in IoT applications, focusing on model development, resource efficiency, and enhancing the intelligent capabilities of IoT devices.

ULO2: Design, implement, test, and debug Artificial Intelligence/Machine Learning algorithms tailored for IoT environments, ensuring performance optimization and reliability.

ULO3: Apply data mining techniques for intelligent processing, big data analysis, and optimization of IoT applications.

ULO4: Integrate Artificial Intelligence/Machine Learning approaches to enhance the performance, robustness, and resilience of IoT systems.

ULO5: Implement Artificial Intelligence/Machine Learning solutions across the IoT ecosystem, from cloud and edge computing to embedded devices, ensuring seamless integration and efficiency.

General Assessment Information

Release Dates

- Assessment 1: To be released no later than 16th August
- Assessment 2: To be released no later than 20th September

The [University's Academic Integrity policy](#) will be enforced. You may assist your fellow students with general concepts, pointers to resources and useful tools or commands that are publicly available. You may not become involved in any way in helping a fellow student to find the solution to their particular task, nor may you share with them any aspect of the solution of your particular task.

Each assessment task must be the sole work of the student turning it in. Any cheating will be handled under the [University's Academic Integrity Policy](#).

Requirements to Pass this Unit

To pass this unit you must:

Achieve a total mark equal to or greater than 50%.

Late submission

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 a technical concern. The late submission rule was changed to align with the new Faculty policy.

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](#).

Assessments where Late Submissions will be accepted

- Assessment 1 – YES, Standard Late Penalty applies
- Assessment 2 – YES, Standard Late Penalty applies
- Quiz – NO, unless special consideration is granted

Special Consideration

The [Special Consideration Policy](#) aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable, and significantly disruptive, and which may affect their performance in assessment. If you experience circumstances or events that affect your ability to complete the assessments in this unit on time, please inform the convenor and submit a Special Consideration request through connect.mq.edu.au.

Short Extensions

All assessments are **NOT** eligible for an automatic short extension.

Details for each assignment will be available via iLearn

You are encouraged to:

- Set your personal deadline earlier than the actual one
- Keep backups of all your important files
- Ensure that no-one else picks up your printouts

Generative AI Open Assessments

The use of generative AI tools is permitted for assignments in this unit when used to support learning and understanding. Students are expected to use these tools to assist with exploring ideas, improving their understanding of concepts, or obtaining feedback, rather than as a substitute for completing the assessment themselves.

Where generative AI is used:

- Any use of generative AI must be appropriately acknowledged in the report in accordance with the unit's referencing requirements.
- AI-generated images may be used for general illustrations where appropriate. However, technical content such as system schematics, flowcharts, software architecture

diagrams, algorithms, and source code must be created by the student.

- All written explanations, technical discussions, analysis, and conclusions must reflect the student's own understanding.
- The submitted source code should follow the programming practices and coding style presented in the lectures. Students are expected to understand every aspect of their implementation.
- During demonstrations or presentations, students may be asked to explain their design decisions, algorithms, and source code. Assessment will consider both the submitted work and the student's ability to demonstrate their understanding of it.

Students are responsible for ensuring that all submitted work complies with the University's Academic Integrity Policy and accurately represents their own knowledge and understanding.

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
Assignment 1	40%	No	13/09/2026 (Sunday of Week 7)	Individual	No	Observed
Assignment 2	40%	No	25/10/2026 (Sunday of Week 11)	Individual	No	Observed
Quiz	20%	No	04/11/2026 (Week 12 - Registered Workshop session)	Individual	No	Observed

Assignment 1

Assessment Type [1](#): Practice-based task

Indicative Time on Task [2](#): 38 hours

Due: **13/09/2026 (Sunday of Week 7)**

Weighting: **40%**

Groupwork/Individual: Individual

Short extension [3](#): No

AI Approach: Observed

Analysis and Problem Solving: The purpose of the problem solving assignment is to help the students to get accustomed to dealing with real world problem situations/issues. It is designed to help students analyse a particular problem and find its best solution

On successful completion you will be able to:

- Analyze the role of Artificial Intelligence and Machine Learning in IoT applications, focusing on model development, resource efficiency, and enhancing the intelligent capabilities of IoT devices.
- Apply data mining techniques for intelligent processing, big data analysis, and optimization of IoT applications.
- Integrate Artificial Intelligence/Machine Learning approaches to enhance the performance, robustness, and resilience of IoT systems.

Assignment 2

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 42 hours

Due: **25/10/2026 (Sunday of Week 11)**

Weighting: **40%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

Design and implementation: Build a prototype using ML techniques to improve the IoT in real time.

On successful completion you will be able to:

- Analyze the role of Artificial Intelligence and Machine Learning in IoT applications, focusing on model development, resource efficiency, and enhancing the intelligent capabilities of IoT devices.
- Design, implement, test, and debug Artificial Intelligence/Machine Learning algorithms tailored for IoT environments, ensuring performance optimization and reliability.
- Apply data mining techniques for intelligent processing, big data analysis, and optimization of IoT applications.
- Integrate Artificial Intelligence/Machine Learning approaches to enhance the performance, robustness, and resilience of IoT systems.
- Implement Artificial Intelligence/Machine Learning solutions across the IoT ecosystem, from cloud and edge computing to embedded devices, ensuring seamless integration and efficiency.

Quiz

Assessment Type ¹: Examination

Indicative Time on Task ²: 18 hours

Due: **04/11/2026 (Week 12 - Registered Workshop session)**

Weighting: **20%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

This assessment is used to measure students' knowledge and comprehension of unit materials.

On successful completion you will be able to:

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- Integrate Artificial Intelligence/Machine Learning approaches to enhance the performance, robustness, and resilience of IoT systems.
- Implement Artificial Intelligence/Machine Learning solutions across the IoT ecosystem, from cloud and edge computing to embedded devices, ensuring seamless integration and efficiency.

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

Classes and Delivery Time

COMP8294 consists of both lectures and workshop sessions. Lectures are held every Wednesday from 1:00 PM to 3:00 PM (*01CC 217 Groupwork Learning Space*), commencing in **Week 1**. Workshop sessions take place onsite every Wednesday from 3:00 PM to 5:00 PM (*04RPD 103 Cyber Networking Lab*), starting in **Week 2**.

Lectures (In-person) are a core learning experience where we will discuss the key theoretical underpinnings and concepts to this unit. Lecture recordings will be available after each lecture in iLearn.

Workshops (In-person) will offer students an opportunity to learn, develop, and subsequently practice concepts to the unit's content via hands-on tasks in a lab setting under the supervision of the demonstrator.

Each week you will be given several problems to work on; it is important that you keep up with these problems as doing so will help you understand the material in the unit and prepare you for the work in assignments. Workshops will also facilitate students to discuss their respective problems effectively with the peers and maximize the feedback they get on their work.

Week 1 classes: Lectures and Workshops begin in Week 1.

Required and Recommended Texts

All required and recommended readings will be provided as part of the lecture material.

Unit Web Page

The unit web page will be hosted in iLearn, where you will need to log in using your Student One ID and password. The unit will make extensive use of discussion boards also hosted in iLearn. Please post questions there, they will be monitored by the staff on the unit.

Methods of Communication

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

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://policies.s.mq.edu.au) (<https://policies.s.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.

Unit information based on version 2026.02 of the [Handbook](#)