



COMP8410

Advanced Topics in Artificial Intelligence

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

School of Computing

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General Information

Unit convenor and teaching staff Lecturer Xuhui Fan xuhui.fan@mq.edu.au 3IR by appointment
Credit points 10
Prerequisites COMP6400
Corequisites
Co-badged status
Unit description The fast moving field of Artificial Intelligence (AI) continues to push the frontiers what machines can achieve. This unit surveys emerging topics and trends in AI. These topics drawn from the latest research literature vary from offering to offering, their selection being inspired by cutting-edge development in the field. These topics include but are not limited to: decision making under uncertainty, reasoning, planning, machine learning, natural language understanding and the legal and ethical implications of AI-driven technologies. The unit consists of lectures, reading, and assessed components of scientific writing in various forms. 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:** Demonstrate an understanding of emerging concepts, techniques, and algorithms in AI.
- ULO2:** Critically navigate and examine the scientific literature within the field of AI.

ULO3: Identify strengths and limitations of recent AI-driven technologies and judge their readiness for industry.

ULO4: Explain the legal and ethical implications that AI has on organizations and on the future of work

ULO5: Communicate and present scientific research clearly and effectively to others.

General Assessment Information

The assessment of this unit consists of two individual assignments and a final exam. The form and date of the final examination will be announced later in the semester. You are expected to participate in all lecture and assignment activities.

Assignments 1 and 2

The Assessment Tasks above are for general information. Detailed statements of Assignment 1 and Assignment 2 for S2, 2026 will be released separately, which will be used for this offering.

Assignment Release Dates

Assignment 1: To be released no later than Thurs 6 Aug 2026 (Week 2).

Assignment 2: To be released no later than Thurs 27 Aug 2026 (Week 5).

Requirements to Pass this Unit

To pass this unit you:

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

Late Assessment Submission & Penalty

Late assessments are not accepted in this unit unless a Special Consideration has been submitted and approved.

From 1 July 2022, Students enrolled in Session based units with written assessments will have the following late penalty applied. Please see <https://students.mq.edu.au/study/assessment-exams/assessments> for more information.

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written 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.

Submission time for all written assessments is set at 11:55 pm on the date they are due.

For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, students need to submit an application for Special Consideration.

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

- Assignment 1: YES, Standard Late Penalty applies

- Assignment 2: YES, Standard Late Penalty applies
- Final exam: 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 <http://connect.mq.edu.au/>.

Supplementary Exam

In general, if you receive Special Consideration for the final exam, a supplementary exam will be scheduled after the normal exam period, following the release of marks. 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.

Assessment Standards

This unit will be assessed and graded according to the University assessment and grading policies and specifically per the rubric of each assignment. There is no hurdle assessment in this unit. The final grade is determined by the total mark the student obtains in all the assessment tasks they completed.

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
Assignment 1	30%	No	17/09/2026	Individual	No	Observed
Assignment 2	30%	No	22/10/2026	Individual	Yes	Open
Final Exam	40%	No	Exam Period	Individual	No	Observed

Assignment 1

Assessment Type ¹: Presentation task

Indicative Time on Task ²: 40 hours

Due: **17/09/2026**

Weighting: **30%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

The students will evaluate two existing the state-of-the-art artificial intelligence systems on worked scenarios; and produce a short written report as well as a video presentation.

On successful completion you will be able to:

- Demonstrate an understanding of emerging concepts, techniques, and algorithms in AI.
- Identify strengths and limitations of recent AI-driven technologies and judge their readiness for industry.
- Communicate and present scientific research clearly and effectively to others.

Assignment 2

Assessment Type ¹: Written Submission

Indicative Time on Task ²: 40 hours

Due: **22/10/2026**

Weighting: **30%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

Students will conduct a case study of an AI application in an industry context, identify problems, develop a strategy, assess ethical and legal implications, and present findings in a written report.

On successful completion you will be able to:

- Demonstrate an understanding of emerging concepts, techniques, and algorithms in AI.
- Identify strengths and limitations of recent AI-driven technologies and judge their readiness for industry.
- Explain the legal and ethical implications that AI has on organizations and on the future of work
- Communicate and present scientific research clearly and effectively to others.

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 20 hours

Due: **Exam Period**

Weighting: **40%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

You will undertake a final examination during the formal examination period.

On successful completion you will be able to:

- Demonstrate an understanding of emerging concepts, techniques, and algorithms in AI.
- Critically navigate and examine the scientific literature within the field of AI.

- Identify strengths and limitations of recent AI-driven technologies and judge their readiness for industry.

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

Each week has two hours of lectures, alongside student's own studies on Assignments for presentations in Assignment 1 and case studies for Assignment 2.

Week 1 classes, including lectures, will start on 30 July 2026.

For details of days, times and rooms of the lectures, please consult the Classfinder tool in [eStudent](#) (read about using the [Classfinder tool](#) for more information).

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

Methods of communication

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.

AI approach

This unit involves two AI approaches:

- Open: The assessments do not restrict the use of AI tools. However, it is expected that the use of AI is acknowledged appropriately, similar to the expectation to provide references for other resources or tools used in producing your work. Any use of AI

should comply with the University's Responsible and Ethical Use of Artificial Intelligence Policy.

- Observed: The assignments are fully observed. AI use will not be permitted during the assessment.

Unit Schedule

Week 1: AI landscape and paradigms

Week 2: Image editing methods

Week 3: 3D generation methods

Week 4: Video generation methods

Week 5: AI evaluation and governance

Week 6: Agentic AI systems

Week 7: Deep variational learning

Week 8: Deep non-IID learning

RECESS

Week 9: LMM inference and finetuning

Week 10: Humanoid multimodal learning

Week 11: Humanoid humanity modeling

Week 12: Physical and virtual AI systems

Week 13: Guest lecture

Policies and Procedures

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

[pport/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>) 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

This unit has been fully redeveloped to cope with the latest advances in AI. The unit will offer a body of knowledge of advanced AI, covering latest content for 1) the evolution and landscape of AI, 2) advanced AI algorithms, 3) advanced AI systems, and 4) AI safety and governance.

We value student feedback to be able to continually improve the way we offer our units. As such we encourage students to provide constructive feedback via student surveys, to the teaching staff directly, or via the FSE Student Experience & Feedback link in the iLearn page.

Changes since First Published

Date	Description
31/07/2026	update the staff contact
21/07/2026	Accidentally with drawn.
21/07/2026	as no workshops for this, changed accordingly
20/07/2026	Give Long bin a chance to address Autumns concerns
15/07/2026	update participation

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

