



# COMP8460

## Artificial Intelligence for Natural Language Processing Applications

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

*School of Computing*

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#### Disclaimer

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## General Information

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| Credit points<br>10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Prerequisites<br>COMP6200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Corequisites                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Co-badged status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Unit description<br>This unit will build on prior knowledge of machine learning to introduce Artificial Intelligence (AI) techniques used in Natural Language Processing (NLP). It will cover how approaches like large language models (LLMs) and foundation models work, and how they can be applied to fundamental NLP tasks like text classification. Students will learn how to use techniques for applying existing LLMs and other tools to build solutions to these fundamental NLP problems, including issues of bias in training and techniques for mitigating this. The unit will also examine a range of other NLP tasks such as text generation, machine translation and semantic parsing; how to use models and tools to address these tasks; and how to evaluate the results. It will further explore links between NLP and other areas of AI, such as in multimodal artificial agents; the uses of AI and NLP in society; and the ramifications of their use in society.<br><br>Learning in this unit enhances student understanding of global challenges identified by the United Nations Sustainable Development Goals ( <a href="#">UNSDGs</a> ) 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 how large language models can be applied to

solve NLP problems.

**ULO2:** Demonstrate an understanding of a range of NLP tasks.

**ULO3:** Apply deep learning and other AI techniques to solve a fundamental NLP problem, and analyse the results of applying the solution.

**ULO4:** Apply existing AI models and tools to solve one of the broader range of NLP tasks reflecting a real-world problem.

**ULO5:** Identify connections between NLP and other areas of AI, and the ramifications of and issues involved in using NLP in society.

## General Assessment Information

### General Assessment Information

This unit has three take-home assessments. You will submit the solutions to the assessments via iLearn by the due date. There is no final examination.

## Late Assessment Submission Penalty

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. 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.

## Assignments Release Dates

The assignments will be released no later than the dates listed below.

- Use of AI tools for NLP - 21/08/2026
- Practical use of AI for NLP applications - 18/09/2026
- Team based project - 23/10/2026

## Assessments where Late Submissions will be accepted

- Use of AI tools for NLP - YES, Standard Late Penalty applies
- Practical use of AI for NLP applications - YES, Standard Late Penalty applies
- Team based project - YES, Standard Late Penalty applies

## Requirements to Pass this Unit

To pass this unit, you must achieve a total mark equal or greater than 50%. This unit does not have hurdle assessments.

## 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](https://connect.mq.edu.au).

## Short Extension

First two assessments are eligible for a short extension. You can only apply for a short extension before the due date to request an extra 3 calendar days to complete eligible assessments.

## Generative AI

- **Open** These assessments do not restrict the application of AI tools. However, it is expected that the use of AI is acknowledged in an appropriate manner, similar to the expectation to provide references for other resources or tools that are used in producing your work. Any use of AI should comply with the University's [Responsible and Ethical Use of Artificial Intelligence Policy](#).
- **Observed** These tasks are either fully or partly observed or invigilated. AI use will either not be permitted or will be restricted during the assessment. For more information, please see <https://students.mq.edu.au/study/assessment-exams/assessments/ai-and-assessment>

## Assessment Tasks

| Name                                                             | Weighting | Hurdle | Due        | Groupwork/Individual | Short Extension | AI Approach |
|------------------------------------------------------------------|-----------|--------|------------|----------------------|-----------------|-------------|
| <a href="#">Use of AI tools for NLP</a>                          | 35%       | No     | 04/09/2026 | Individual           | Yes             | Open        |
| <a href="#">Practical use of AI for NLP Applications</a>         | 35%       | No     | 16/10/2026 | Individual           | Yes             | Open        |
| <a href="#">Team based project to solve a real world problem</a> | 30%       | No     | 06/11/2026 | Group                | No              | Open        |

## Use of AI tools for NLP

Assessment Type <sup>1</sup>: Problem-based task

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **04/09/2026**

Weighting: **35%**

Groupwork/Individual: Individual

Short extension <sup>3</sup>: Yes

AI Approach: Open

Use of third-party AI tools and libraries that use NLP to solve a set of tasks.

On successful completion you will be able to:

- Demonstrate an understanding of how large language models can be applied to solve NLP problems.
- Demonstrate an understanding of a range of NLP tasks.
- Apply deep learning and other AI techniques to solve a fundamental NLP problem, and analyse the results of applying the solution.

## Practical use of AI for NLP Applications

Assessment Type <sup>1</sup>: Portfolio

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **16/10/2026**

Weighting: **35%**

Groupwork/Individual: Individual

Short extension <sup>3</sup>: Yes

AI Approach: Open

Address a realistic practical scenario by using AI NLP tools and techniques.

On successful completion you will be able to:

- Demonstrate an understanding of a range of NLP tasks.
- Apply existing AI models and tools to solve one of the broader range of NLP tasks reflecting a real-world problem.

## Team based project to solve a real world problem

Assessment Type <sup>1</sup>: Portfolio

Indicative Time on Task <sup>2</sup>: 40 hours

Due: **06/11/2026**

Weighting: **30%**

Groupwork/Individual: Group

Short extension <sup>3</sup>: No

AI Approach: Open

A team based project that applies the content of the unit to solve a real world problem.

On successful completion you will be able to:

- Demonstrate an understanding of how large language models can be applied to solve NLP problems.
- Demonstrate an understanding of a range of NLP tasks.
- Apply existing AI models and tools to solve one of the broader range of NLP tasks reflecting a real-world problem.
- Identify connections between NLP and other areas of AI, and the ramifications of and issues involved in using NLP in society.

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<sup>1</sup> 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.

<sup>2</sup> Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation.

<sup>3</sup> An automatic short extension is available for some assessments. Apply through the [Service Connect Portal](#).

## Delivery and Resources

During most of the weeks, there will be 2 hours of lectures and 2 hours of Practicals. All the required software will be installed in the computers of the PC labs allocated for the Practicals but you are free to bring your own device and install the software.

**Lectures and practicals start on Week 1.**

## Delivery Modes

All lectures and Practicals are delivered in campus. The lectures will also be recorded and recordings of the lecture will be available via iLearn. There will not be recordings of the Practical sessions.

## Methods of Communication

We will communicate with you via your university email or through announcements in iLearn. Queries to convenors can be made via the Contact tool in iLearn or sent to [usman.naseem@mq.edu.au](mailto:usman.naseem@mq.edu.au) from your **university email** address.

## Reading

Every week there will be a list of required and recommended readings. The list will be maintained in iLearn.

Most of the contents of the unit will be based on the following books:

- Brian McMahan, Delip Rao. Natural Language Processing with PyTorch. O'Reilly 2019. Available in the library.
- Thomas Dop. Hands-on Natural Language Processing with PyTorch 1.x. Pack Publishing 2020. Available in the library.
- Artificial Intelligence: A Modern Approach, Fourth Edition, Stuart J. Russell and Peter Norvig, Pearson, 2021, ISBN: 9781292401133 , <https://aima.cs.berkeley.edu/>. Available in the library.
- Natural Language Processing with Transformers, Revised Edition, Lewis Tunstall, Leandro von Werra, and Thomas Wolf. O'Reilly Media, Inc. 2022, ISBN: 9781098136796. Available in the library.
- Hands-On Large Language Models, Jay Alammar, and Maarten Grootendorst, O'Reilly Media, Inc., 2024, ISBN: 9781098150969. Available in the library.

Additional useful readings are:

- Steven Bird, Ewan Klein, Edward Loper. Natural Language Processing -- Analyzing Text with Python and the Natural Language Toolkit. Available [online](#).
- Dan Jurafsky and James H. Martin (2025), Speech and Language Processing (3rd ed. draft). Available [online](#).
- Hands-On Machine Learning with Scikit-Learn and TensorFlow, by Aurélien Géron (O'Reilly). Available in the library.
- Deep Learning for Coders with fastai and PyTorch, by Jeremy Howard and Sylvain Gugger (O'Reilly). Available in the library.
- The Hugging Face LLM Course, by the open source team at Hugging Face. Available [online](#).

## Software

The main software for this unit is Anaconda for Python 3.11 with the following packages:

1. numpy
2. scipy
3. pandas

4. matplotlib
5. nltk
6. scikit-learn
7. scikit-image
8. gensim
9. pytorch
10. torchtext
11. spacy
12. transformers
13. regex (re)
14. seaborn

## Unit Web Page

Note that the majority of the unit materials is publicly available while some material requires you to log in to [iLearn](#) to access it.

The unit will make extensive use of discussion boards hosted within [iLearn](#). Please post questions there, they will be monitored by the staff on the unit.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#) (<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>). 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](https://connect.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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

We value student feedback as a way to continually improve how we offer our units. We encourage students to provide constructive feedback via student surveys, directly to teaching staff, or through the FSE Student Experience & Feedback link on the iLearn page.

Student feedback from the previous offering of this unit was very positive overall, with students pleased with the clarity of assessment requirements and the support provided by teaching staff. As such, only minor changes to the delivery of the unit are planned. Some content will be refined to support clearer and more effective learning, particularly for students newer to AI who would benefit from additional foundational grounding in the technical material. We will continue to strive to improve student support and engagement.

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