



COMP3010

Algorithm Theory and Design

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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Credit points

10

Prerequisites

130cp at 1000 level or above including COMP2010 and MATH2907

Corequisites

Co-badged status

COMP6102

Unit description

This unit covers general issues of the theory of computation and algorithm design, including computability and complexity. The general principles are illustrated by designing several very efficient algorithms with applications in telecommunication networks, cryptography and other important fields.

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: Solve concrete problems and provide adapted algorithmic solutions using advanced algorithmic knowledge.

ULO2: Design and implement algorithms to satisfy specified problem constraints.

ULO3: Communicate clearly and effectively the relevant aspects of algorithms and their performance.

ULO4: Work collaboratively in a small team to design and implement advanced algorithms.

General Assessment Information

Assessment Tasks

Assignment 1 and 2 are both due by 11:55pm on the date specified in the assessment table.

A one hour technical time window is allowed for issues uploading - no penalty applied, no extra application required.

There is a "Short extension" available for Assignment 1 and Assignment 2. For details on how this mechanism works, please refer to <https://students.mq.edu.au/study/assessment-exams/assessments/short-extensions>.

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

Requirements to Pass this Unit

The final mark for the unit will be calculated by combining the marks for all assessment tasks according to the percentage weightings shown in the assessment summary.

To pass this unit you must achieve a final mark equal to or greater than 50% based on the assessment tasks summary. There is no hurdle.

Students are expected to attend classes and engage in all learning activities even though there are no marks or hurdles attached to such things.

Release

Assignment 1 should be available by the end of week 3 (Sunday 16 August).

Assignment 2 should be available by the end of week 7 (Sunday 13 September).

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 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.

Example calculation: 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.

Assessments where Late Submissions will be accepted according to the late submission policy above:

- Assignment 1
- Assignment 2

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/>.

AI Approach

- **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
Assignment 1	30%	No	18/09/2026	Individual	Yes	Open
Assignment 2	30%	No	30/10/2026	Individual	Yes	Open
Final Exam	40%	No	Exam Period	Individual	No	Observed

Assignment 1

Assessment Type ¹: Creative task

Indicative Time on Task ²: 30 hours

Due: **18/09/2026**

Weighting: **30%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

This assignment assesses students' ability to design, implement and understand algorithm strategies covered during the first 4 weeks.

On successful completion you will be able to:

- Solve concrete problems and provide adapted algorithmic solutions using advanced algorithmic knowledge.
- Design and implement algorithms to satisfy specified problem constraints.
- Communicate clearly and effectively the relevant aspects of algorithms and their performance.
- Work collaboratively in a small team to design and implement advanced algorithms.

Assignment 2

Assessment Type ¹: Written Submission

Indicative Time on Task ²: 30 hours

Due: **30/10/2026**

Weighting: **30%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

This assignment assesses students' ability to design, implement and understand algorithm strategies covered during the second part of the unit.

On successful completion you will be able to:

- Solve concrete problems and provide adapted algorithmic solutions using advanced algorithmic knowledge.
- Design and implement algorithms to satisfy specified problem constraints.
- Communicate clearly and effectively the relevant aspects of algorithms and their performance.
- Work collaboratively in a small team to design and implement advanced algorithms.

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:

- Solve concrete problems and provide adapted algorithmic solutions using advanced algorithmic knowledge.
- Communicate clearly and effectively the relevant aspects of algorithms and their performance.

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

Check your eStudent enrollment for times and locations of your selected classes. You are expected to enrol in the 2-hour lecture and also a 2-hour practical class for each week.

- *Lectures: (starting week 1)*
 - *These are intended as interactive delivery, not as one-way communication. Please attend live in person or live via ECHO360.*
- *Practical Classes: (starting week 2, covering the previous week's lecture concepts)*
 - *Held in 4RPD room 102 (a non-computer-lab room). Please bring your own device / notebook / writing paper, and also a strategy for taking notes / drawing as needed.*
 - *Questions and activities provided each week in iLearn.*
 - *The intent of these practical classes is to dive in and explore different strategies and problems each week. There will also be some group challenges on occasion in the classes to help explore different approaches and outcomes.*

- *The practical class also gives you a chance to discuss any course-related problem you may have. These problems can be discussed with the practical staff and your peers.*

It is important that you keep up with the problems in your practical classes as well as any "follow-up tasks" as doing so will help you understand the material in the unit and prepare you for your assessments and demonstrating the unit learning outcomes.

Methods of Communication

Our primary means of communication will be through the unit forums in the COMP3010 iLearn page. We may also send communications to your student email. You are expected to check both avenues of communication regularly.

The teaching staff will not entertain emails that do not originate from university email IDs. Additionally, significant announcements will be posted on iLearn, a centralised platform for accessing vital details about the course. Should you have any queries or require assistance from the teaching staff, including the unit convenor, you have two communication channels.

- Firstly, you can post your queries on the iLearn discussion board, providing an interactive space for instructors and peers to engage in discussions.
- Alternatively, you may send emails to the corresponding addresses of the teaching staff using your university email address for official communication.

Through these communication methods, we aim to ensure effective and timely dissemination of information and provide the necessary support throughout the course. We aim to have communications returned next business day. So if a message is sent to us on a Friday 4pm, it may not receive a reply until some time on the following Monday.

Resources

The following textbooks are not required for COMP3010, but are highly recommended as we will use them as the basis for most of the course. Both textbooks are available online via the library website.

- (CLRS) T. H. Cormen, C. E. Leiserson, R. L. Rivest, & C. Stein, Introduction to Algorithms (MIT Press) 3rd edition. ISBN 0-262-53305-7.
- (Skiena) S. S. Skiena, The Algorithm Design Manual, Springer, 2nd edition, 2008, ISBN: 978-1-84800-069-8

Technology

The coding component for this course will be presented using the Java programming language as the recommended development environment. You may be expected to use git version control repositories, docker, and/or a cloud-based repository hosting platform for parts of the course. We may provide extra scaffolding for test automation / correctness checking, but should not require any paid software to do so.

Unit Schedule

Tentative lecture schedule for COMP3010 is as follows:

1. Introduction and Complexity Analysis
2. Algorithm Correctness
3. Asymptotic Notations
4. Greedy Algorithms
5. Divide & Conquer
6. Dynamic Programming
7. Probabilistic Algorithms
8. String algorithms
9. Graph Algorithms
10. Graph Algorithms (continued)
11. Continuing with graph algorithms
12. Reduction and comparing the hardness of problems
13. Revision

Note: There is a 2-week mid-session teaching break in between week 8 and week 9.

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

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. The classes have been moved out of the computer labs to help foster a more collaborative and interactive discourse in the practical classes.

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