



COMP6010

Fundamentals of Computer Science

Session 1, In person-scheduled-weekday, North Ryde 2022

School of Computing

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General Information

Unit convenor and teaching staff

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Lecturer

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Credit points

10

Prerequisites

Corequisites

Co-badged status

Unit description

This unit provides a study of algorithms, data structures and programming techniques. The topics covered include: trees; graphs and heaps; advanced sorting techniques; elements of storage management; and complexity. The presentation emphasises the role of data abstraction and correctness proofs.

This unit provides a foundation-level study of programming. The topics covered include programming environment and the process of program execution, variables, operators, boolean logic, control structures including conditions and loops, functions, storage of collection of items and performing operations on the same, and file management.

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: Apply enhanced problem solving skills to develop algorithms

ULO2: Implement programs from algorithms, showing an understanding of control flow.

ULO3: Adhere to standard software development skills such as test-driven development and debugging

ULO4: Understand and apply important foundation-level programming concepts such as variables, operators, boolean logic, control structures, functions and collections

General Assessment Information

Note that the second practical exam is a hurdle and you must at least 50% (12.5 out of 25) to clear this hurdle. You will get two attempts. One in week 12 practical and the second in week 13 practical. The best of the two attempts will count towards your final mark.

Late submissions **will not be accepted** without an approved Special Consideration request. Assessments submitted after the due date will receive a mark of **zero**.

Assessment Tasks

| Name | Weighting | Hurdle | Due |
|---|-----------|--------|---|
| <u>Assignment 1</u> | 5% | No | 5pm, Sunday 27th March |
| <u>Assignment 2</u> | 15% | No | 5pm, Sunday 3rd June |
| <u>Practical Exam 1</u> | 15% | No | Week 8 Practical (Week starting 25th April) |
| <u>Practical Exam 2</u> | 25% | Yes | Week 12, 13 Practicals |
| <u>Weekly submissions</u> | 0% | No | Weekly |
| <u>Final Examination</u> | 40% | No | Final exam period |

Assignment 1

Assessment Type ¹: Programming Task

Indicative Time on Task ²: 5 hours

Due: **5pm, Sunday 27th March**

Weighting: **5%**

Programming assignment that requires students to solve a real-life problem based on the contents covered in the first half of the semester

On successful completion you will be able to:

- Apply enhanced problem solving skills to develop algorithms
- Implement programs from algorithms, showing an understanding of control flow.
- Adhere to standard software development skills such as test-driven development and debugging
- Understand and apply important foundation-level programming concepts such as variables, operators, boolean logic, control structures, functions and collections

Assignment 2

Assessment Type ¹: Programming Task

Indicative Time on Task ²: 15 hours

Due: **5pm, Sunday 3rd June**

Weighting: **15%**

Programming assignment that requires students to solve a real-life problem based on the contents covered during the semester

On successful completion you will be able to:

- Apply enhanced problem solving skills to develop algorithms
- Implement programs from algorithms, showing an understanding of control flow.
- Adhere to standard software development skills such as test-driven development and debugging
- Understand and apply important foundation-level programming concepts such as variables, operators, boolean logic, control structures, functions and collections

Practical Exam 1

Assessment Type ¹: Programming Task

Indicative Time on Task ²: 10 hours

Due: **Week 8 Practical (Week starting 25th April)**

Weighting: **15%**

In-class practical exam assessing contents covered during first half of semester

On successful completion you will be able to:

- Apply enhanced problem solving skills to develop algorithms
- Implement programs from algorithms, showing an understanding of control flow.
- Adhere to standard software development skills such as test-driven development and debugging
- Understand and apply important foundation-level programming concepts such as variables, operators, boolean logic, control structures, functions and collections

Practical Exam 2

Assessment Type ¹: Programming Task

Indicative Time on Task ²: 15 hours

Due: **Week 12, 13 Practicals**

Weighting: **25%**

This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)

In-class practical exam assessing contents covered during the entire semester

On successful completion you will be able to:

- Apply enhanced problem solving skills to develop algorithms
- Implement programs from algorithms, showing an understanding of control flow.
- Adhere to standard software development skills such as test-driven development and debugging
- Understand and apply important foundation-level programming concepts such as variables, operators, boolean logic, control structures, functions and collections

Weekly submissions

Assessment Type ¹: Programming Task

Indicative Time on Task ²: 15 hours

Due: **Weekly**

Weighting: **0%**

Each week, students are required to submit a piece of code containing solutions to a given set of problems

On successful completion you will be able to:

- Apply enhanced problem solving skills to develop algorithms
- Implement programs from algorithms, showing an understanding of control flow.
- Adhere to standard software development skills such as test-driven development and debugging
- Understand and apply important foundation-level programming concepts such as variables, operators, boolean logic, control structures, functions and collections

Final Examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 12 hours

Due: **Final exam period**

Weighting: **40%**

2-hour written exam

On successful completion you will be able to:

- Apply enhanced problem solving skills to develop algorithms
- Implement programs from algorithms, showing an understanding of control flow.
- Adhere to standard software development skills such as test-driven development and debugging
- Understand and apply important foundation-level programming concepts such as variables, operators, boolean logic, control structures, functions and collections

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

Lecture notes: <https://softwaretechnologymq.github.io/>

Python (version 3.10.2 at the time of writing this unit guide): <https://python.org/>

Visual Studio Code: <https://code.visualstudio.com/>

Unit Schedule

NOTE: Practical classes begin in week 2. The schedule is for lectures.

- Week 1 - python basics
- Week 2 - number systems
- Week 3 - boolean logic
- Week 4 - conditions
- Week 5 - loops
- Week 6 - functions 1
- Week 7 - problem-solving/case study using topics from Weeks 1 to 6

TWO-WEEK TEACHING BREAK

- Week 8 - collections* 1
- Week 9 - collections* 2

- Week 10 - classes
- Week 11 - file system, i/o (raw csv i/o)
- Week 12 - problem-solving/case study using topics from Weeks 1 to 11
- Week 13 - revision

* one or more from lists, dictionaries, tuples, sets

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

Environment changed from Java to Python

Changes since First Published

| Date | Description |
|------------|---|
| 01/03/2022 | shreyas added to the staff list. assignment 1 due date corrected. |