COMP6010

Fundamentals of Computer Science

Session 1, Weekday attendance, North Ryde 2020

Department of Computing

Contents

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General Information

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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.

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 the underlying architecture of the computer

ULO3: Adhere to standard software engineering practices

ULO4: Compare different methods available for the same problem in terms of efficiency and other criteria

Assessment Tasks

Coronavirus (COVID-19) Update

Assessment details are no longer provided here as a result of changes due to the Coronavirus (COVID-19) pandemic.

Students should consult iLearn for revised unit information.

Find out more about the Coronavirus (COVID-19) and potential impacts on staff and students

General Assessment Information

Students with reasonable adjustments

Students with reasonable adjustment approvals will sit practical exams in relevant weeks on **Friday 18:00.**

Practical Exam 2

For practical exam 2, the **best (out of 2 attempts) mark** counts towards the final grade.

Late Submission

No extensions will be granted without an approved application for Special Consideration. There will be a deduction of 20% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that the submission is late. For example, 25 hours late in submission for an assignment worth 10 marks – 40% penalty or 4 marks deducted from the total. No submission will be accepted after solutions have been posted.

Delivery and Resources

Coronavirus (COVID-19) Update

Any references to on-campus delivery below may no longer be relevant due to COVID-19.

Please check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

CLASSES

Each week you should attend

- two hours of lectures, and,
- two hour practicals,

Additionally, a two-hour workshop is held that serves as *consultation hours*.

For details of days, times and rooms consult the timetables webpage.

Note that Lectures and Workshops commence in week 1.

You should have selected a workshop during enrolment. **You should attend the workshop you are enrolled in**. If you do not have a class, or if you wish to change one, you should see the enrolment operators in the 14 Sir Christopher Ondaatje avenue courtyard during the first two weeks of the semester. Thereafter you should go to the Science and Engineering Student Services Centre.

Please note that you are **required** to submit work regularly. You will get the help that you need by attending your workshop. Failure to submit work may result in you failing the unit (see the precise requirements in the "Grading Standards" section) or being excluded from the final examination.

REQUIRED AND RECOMMENDED TEXTS AND/OR MATERIALS

Textbook

The first book in the following list, namely *Starting out with Java*, is the recommended text book. The other books listed are helpful references.

- **T. Gaddis, Starting out with Java: From control structures through objects (Pearson), Global edition (6th). ISBN 9781292110653**
- W. Savitch, Absolute Java (Pearson) 5th edition. ISBN 9780132830317
- B. Eckel, Thinking in Java (electronic book, 3rd edition available within iLearn is fine and is free but does not cover data structures)
- A. Drozdek, Data Structures and Algorithms in Java (Cengage) 2nd edition. ISBN 9780534492526

TECHNOLOGY USED AND REQUIRED

Audio Lecture

Digital recordings of lectures are available from within iLearn via **Active Learning Platform**.

Technology

- Java SE - download Java SE 9 (8 is also fine) to be compatible with the labs.
- Eclipse and Visual Studio Code - IDEs used.
- Learning Management System iLearn
- http://codingbat.com/ for programming exercises.

Discussion Boards

The unit makes use of forums hosted within iLearn. Please post questions there, they are monitored by the unit staff.

Unit Schedule

Coronavirus (COVID-19) Update

The unit schedule/topics and any references to on-campus delivery below may no longer be relevant due to COVID-19. Please consult iLearn for latest details, and check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

Note that three important themes will pervade the entire unit:

1. Problem solving. A crucial skill for all of the weekly topics will be to write appropriate code to meet a given problem specification. This theme relates to the first two learning outcomes for this unit.

2. Software development. Use of the JUnit testing framework is an important development practice which will be taught from the beginning, and used throughout the unit. This theme relates to the third learning outcome of this unit.

3. Comparing different solution methods. Very often different algorithms are available for the same problem. Another important skill to develop throughout this unit is the ability to compare different algorithms in terms of efficiency and other criteria. This theme relates to the fourth learning outcome of this unit.

Tentative teaching schedule, subject to change:

WEEK	TOPIC
1	Introduction, fundamentals
2	Basics of programming
3	Control Structures
4	Functions - 1
5	Arrays - 1
6	Functions and arrays

7	Case study
8	Classes and objects
9	Lists and Maps
10	Time complexity
11	Useful algorithms
12	Computer Organization
13	Review

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). 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
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public
- Special Consideration Policy *(**Note:** The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

Students seeking more policy resources can visit the Student Policy Gateway (https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/study/getting-started/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

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- Getting help with your assignment
- Workshops
- StudyWise
- 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

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

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

1. week 12 topic changed from "low level programming" to "computer organization".
2. two attempts offered for the hurdle Practical Exam 2 to all students.