



WCOM125

Fundamentals of Computer Science

MUIC Jan 2018

Macquarie University International College

Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	2
<u>General Assessment Information</u>	3
<u>Assessment Tasks</u>	13
<u>Delivery and Resources</u>	16
<u>Unit Schedule</u>	20
<u>Learning and Teaching Activities</u>	21
<u>Policies and Procedures</u>	22
<u>Graduate Capabilities</u>	25
<u>Changes from Previous Offering</u>	28
<u>Course Contact Hours</u>	28
<u>Unit Specific Texts and Materials</u>	28

Disclaimer

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General Information

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Credit points

3

Prerequisites

WCOM115

Corequisites

Co-badged status

Unit description

This unit studies programming as a systematic discipline and introduces more formal software design methods. Programming skills are extended to include elementary data structures and abstract data types. There is a strong emphasis on problem solving and algorithms, including aspects of correctness, complexity and computability.

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:

Apply enhanced problem solving skills to develop algorithms

Implement programs (from algorithms), showing an understanding of the underlying

architecture of the computer

Adhere to standard software engineering practices (in particular documentation using Javadoc, testing using JUnit framework and debugging using Eclipse debugger)

Compare different methods available to solve the same problem in terms of efficiency and other criteria.

Use discipline specific terminology to communicate concepts and ideas relevant to this unit

General Assessment Information

Requirements to Pass

In order to pass this unit a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/ CR/ D/ HD).

For further details about grading, please refer to [Schedule 1](#) of the [Assessment Policy](#).

Students must also pass any hurdle assessments as stipulated in the Assessment Section of this Unit Guide.

Grading

The College will award common result grades as specified in [Schedule 1](#) of the [Assessment Policy](#).

Students will receive criteria and standards for specific assessment tasks, which will be aligned with the grading descriptors given in [Schedule 1](#).

The attainment (or otherwise) of learning outcomes for a unit of study will be reported by grade and mark which will correspond to the Schedule 1 and be as outlined below.

Grade		Mark Range	Outcome	Description
HD	High Distinction	85-100	Pass	Provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality, insight or creativity in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application as appropriate to the program.
D	Distinction	75-84	Pass	Provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality or creativity in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the program and the audience.
CR	Credit	65-74	Pass	Provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; convincing argumentation with appropriate coherent justification; communication of ideas fluently and clearly in terms of the conventions of the program.

P	Pass	50-64	Pass	Provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the program; routine argumentation with acceptable justification; communication of information and ideas adequately in terms of the conventions of the program. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes.
F	Fail	0-49	Fail	Does not provide evidence of attainment of learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of study; missing, undeveloped, inappropriate or confusing argumentation; incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the program.
FA	Fail		Did Not Attend	Student has failed the compulsory attendance component of assessment
FH	Fail	49	Failed Hurdle	Student has obtained a raw mark over 50, yet failed all available attempts of at least one hurdle assessment (as described within Schedule 2 of the Assessment Policy).

Final Grades not receiving a mark because the student has withdrawn after the Census Date, not submitted or completed one or more components of the assessment, has been awarded a supplementary assessment or because of an unresolved matter such as allegations of academic misconduct are outlined in [Schedule 1](#).

Where to find information about assessment

General assessment information including the number and nature of assessments, due dates and weightings has been provided in this unit guide.

Specific assessment information including assignment instructions, questions, marking criteria and rubrics as well as examples of relevant and related assessment tasks and responses will be available in the Assessment section on iLearn. For units that have final examinations, students may access past final exam papers using [MultiSearch](#).

Student Responsibilities

As per the [Assessment Policy](#), students are responsible for their learning and are expected to:

- actively engage with assessment tasks, including carefully reading the guidance provided, understanding criteria, spending sufficient time on the task and submitting work on time;
- read, reflect and act on feedback provided;
- actively engage in activities designed to develop assessment literacy, including taking the initiative where appropriate (e.g. seeking clarification or advice, negotiating learning contracts, developing grading criteria and rubrics);
- provide constructive feedback on assessment processes and tasks through student

feedback mechanisms (e.g. student surveys, suggestions for future offerings, student representation on committees);

- ensure that their work is their own; and
- be familiar with University policy and College procedures and act in accordance with those policy and procedures.

Submission of Assessment Tasks

Assessments must be submitted in accordance with instructions provided in this unit guide.

Assessment tasks which have not been submitted as required will not be marked; they will be considered a non-submission and zero marks will be awarded for the task.

Extensions & Late Submissions

Extensions will only be granted as a result of a successful application for Special Consideration.

To apply for an extension of time for submission of an assessment item, students must submit their application for Special Consideration via ask.mq.edu.au.

Late submissions without an approved extension are possible but will be penalised at 20% per 24 hour period or thereof up to 4 days (weekend inclusive).

Example: An assignment is due at 5:00 pm on a Friday and is marked out of 100 marks.

- If a student submits at 5:02 pm on the Friday and no special consideration has been granted, a penalty of 20% of the total marks possible (20 marks) will be deducted from their result.
- If the student submits the assignment on Sunday and no special consideration has been granted, then a penalty of 40% (40 marks) will be deducted and so on.
- If a student submits an assessment task 5 or more days after the due date and no special consideration has been granted, a record of submission will be made and student will be provided with feedback, but they will receive zero marks for the assessment task as a full (100%) penalty will be applied.

Where a student has been granted an extension and submits late, late penalties will be applied following the due date.

Please see “In class assessment” section for further information on in class assessments.

Resubmissions after the Due Date / Time

Students may resubmit their work up to four days after the due date if for example, they have submitted the incorrect document, or forgotten to include information. These resubmissions will be treated as late submissions and will be penalised at 20% per 24 hour period or thereof up to 4 days (weekend inclusive). After the 5th day record of submission will be made and feedback provided on the new content submitted but the student will receive zero marks for the assessment task.

In order to resubmit your work you will need to contact your teacher, and ask them to

delete your original submission so that you can upload a new one. Teaching staff contact details have been provided in this unit guide.

Retention of Originals

It is the responsibility of the student to retain a copy of any work submitted. Students must produce these documents upon request. Copies should be retained until the end of the grade appeal period each term.

In the event that a student is asked to produce another copy of work submitted and is unable to do so, they may be awarded zero (0) for that particular assessment task.

Requests for original documentation will be sent to the applicant's student email address within six (6) months of notification by the student. Students must retain all original documentation for the duration of this six (6) month period and must supply original documents to the University within ten (10) working days of such a request being made.

In Class Assessment

Students must bring their Student ID Card to all assessment tasks, including in class assessments and produce this if requested. Students may be refused the opportunity to take an in class assessment task where unable to show their student ID card.

Where an assessment is to be held or submitted a scheduled lesson, students must be ready to submit, present or sit the assessment task at the start of the lesson, however not all assessments may commence at the beginning of the lesson. No additional time or adjustment will be made for late arriving students or students not ready to submit an assessment at the start of the lesson and late penalties may apply.

For example, if a one hour test or quiz is due to take place in a three hour lesson, the test or quiz may start at any time in the first two hours, so students must be ready to take the test at the beginning of the lesson. No additional time will be given to or adjustment made for students who arrive late. While they may still be permitted to take the test, depending on the task, the student will have only the remaining time to complete the task. Similarly, where an assessment task is due in a given lesson, late penalties may apply to a student who submits the task at the end of the lesson, depending on submission instructions for the task.

Final Examinations

The final examination period is from Thursday Week 6 until Monday of Week 7, including the weekend. This means that examinations and assessments may be held/due on the Saturday during the final examination period and students must be available to take exams and submit assessments on this day. For unit specific details please refer to the Assessment section of this unit guide.

The University will publish the [College Final Examination Timetable](#) at least 4 weeks before the commencement of the final examination period and students will be able to access their final examination schedule in Week 3 of the Term.

Final Examination Requirements

Schedule 4 of the Assessment Policy explains what students are responsible for:

- checking the final examination timetable
- knowing the examination location (including seat number allocation) and arriving at allocated examination venue on time.
- knowing the structure and format of the examination
- adhering to the final examination timetable
- ensuring they are available for the full duration of the final examination period and supplementary examination period.

Details of the structure and format of the final examination paper will be made available to students via iLearn prior to the start of the final examination period. This detail will include:

- a copy of the examination coversheet, giving the conditions under which the examination will be held
- information on the types of questions the examination will contain, and
- an indication of the unit content the paper may examine.

Students must follow directions given by the Final Examination Supervisor.

Students will be required to present their Macquarie University Campus Card as photographic proof of identity for the duration of the final examination and may be refused the opportunity to take a final examination where unable to show their student ID card.

Students are not permitted to:

- enter a final examination venue once one hour from the time of commencement (excluding any reading time) has elapsed
- leave a final examination venue before one hour from the time of commencement (excluding any reading time) has elapsed
- leave a final examination venue during the last 15 minutes of the examination
- be readmitted to a final examination venue unless they were under approved supervision during the full period of their absence
- obtain, or attempt to obtain, assistance in undertaking or completing the final examination script
- receive, or attempt to receive, assistance in undertaking or completing the final examination script (Unless an application for reasonable adjustment has been approved)
- communicate in any way with another student once they have entered the final examination venue

Missed assessments and examinations

The [Special Consideration Policy](#) establishes the principles that support students seeking to notify the University when they experience short-term, unexpected, serious and unavoidable circumstances, which affect their performance in assessment. This Policy applies only to short-

term, serious and unavoidable circumstances that arise after a study period has commenced, and where specific assessment task/s have been affected. Students with a pre-existing disability/health condition or prolonged adverse circumstances are advised to seek support from Campus Wellbeing and should also refer to the Student Disability Support Policy.

In order to support students who have experienced serious and unavoidable circumstances, the University will attempt to provide affected students with one (1) additional opportunity to demonstrate that they have met the learning outcomes of a unit or units. An additional opportunity provided under such circumstances is referred to as Special Consideration, and may be granted after careful evaluation of the supporting evidence.

Students are expected to plan their work so that they can meet assessment deadlines at the same time as other obligations which they may have, both inside and outside the University. Special Consideration will not be granted when students are unable to complete an assessment task due to planned or foreseeable absence (e.g. holidays, recreational activities or normal work commitments or changes).

All applications for Special Consideration must be substantiated by original, independent documentary evidence in the format and by the deadline prescribed in the Procedure.

Please refer to the [Special Consideration Policy](#) section under Policies and Procedures below.

Supplementary Tests, Supplementary Examinations and Second Attempts at a Hurdle Assessments

Where a student has been granted a supplementary test or examination as a result of an application for special consideration, they will be advised of the time, date and location for the supplementary task.

Supplementary interim assessments (i.e. assessments held during the term) will be held throughout the term with sittings typically taking place on these days:

- Week 3: Wednesday AND/OR Friday
- Week 5: Wednesday AND/OR Friday
- Week 6: Thursday

The supplementary final examination period (i.e. for formal, end of term examinations) will span from Monday Week 7 until Friday Week 1 of the subsequent teaching term. Students who have lodged a special consideration application must be available to undertake examinations during the supplementary examination period.

Where a student is eligible for a **second attempt at a hurdle assessment**, this will typically be organised during the supplementary interim/final examination periods unless stipulated otherwise in the assessment section of the unit guide. Students awarded second attempts at hurdles will be notified via email so please ensure you are checking your student email regularly.

No more than one (1) alternate assessment will be offered to a student in each affected unit, so it is essential that the student makes themselves available for the alternative assessment activity. Please refer to the [Special Consideration Policy](#) for further details.

Results for supplementary final examinations may not be available for up to two weeks following the supplementary examination. Students in their final term of study who undertake supplementary final exams and students who apply for special consideration for a unit which is a prerequisite to another unit in their program should note that formal completion of their Program will not be possible until supplementary results are released and this may impact on their ability to enrol in subsequent programs of study on time.

Accessing your Results

Students will be able to view their results for internal assessments via the Grades section in [iLearn](#).

Grades (e.g. HD, D, CR, P, F) for all assessment tasks will be released to students once marking has concluded. Marks for individual assessments may be released as well.

Final results for the unit will be released at 00:01 on Friday of Week 7. Students will be able to view their final result for the unit via [eStudent](#).

Calculating your GPA

A Grade Point Average (GPA) is a calculation that reflects the overall grades of a student in a coursework program. Please refer to the [GPA Calculator](#).

Obtaining Feedback

Teaching staff will provide students with feedback about their academic progress and performance in assessment tasks or a unit of study. Where relevant, other staff such as Senior Teachers, Program Managers and members of the Student Administration and Services Team will provide feedback and advice to students about their performance in a program of study. Feedback may be provided to individual students, a group of students or a whole class and it may be written or verbal in nature.

Some examples of feedback include:

- Teaching staff member reviewing a draft submission and giving a student advice on how to improve their work before making a final submission
- Teaching staff member telling a class that they need to improve their editing of grammar in their recently submitted assignment.
- Teaching staff member discussing progress of an individual student before census date to allow the student to decide whether they should remain enrolled in the unit.
- Online feedback via announcements or forums, an online marking rubric or various iLearn activities employed in a unit. Please note that feedback on written assessments is usually provided via Feedback Studio in iLearn.
- Written marks and comments on a marking sheet or essay.

Recorded voice comment provided in response to an essay submitted online.

- A student receiving advice that they should consider withdrawing from a unit because

they have missed too many classes / too much work to be able to catch up or for other reasons.

It is a student's responsibility to:

- Attend sessions, be present and actively engaged during times when feedback is provided in scheduled class times.
- If absent from an in-class feedback session due to unavoidable circumstances, organise an alternative time with the teacher so that they can receive their feedback
- Ensure that they have received sufficient feedback prior to their next assessment task and/or final assessment in the unit
- Act promptly on feedback provided (e.g. incorporate advice provided into their work and study habits).

If you are unsure how or when feedback has been or will be provided, or you feel that feedback provided is not sufficient, you must approach relevant teaching or administrative staff and request additional feedback in a timely manner during the term and prior to any subsequent assessment task or the final assessment task for the unit. Claims that not enough feedback has been provided are not grounds for a grade appeal, especially where a student has not made any effort to approach staff about obtaining additional feedback in a timely manner. Students may seek general feedback about performance in a unit up to 6 months following results release.

If you have any problems contacting your teacher you must seek help from administrative staff at the E3A Level 2 Reception.

Contacting Teaching Staff Obtaining Help

Students may contact teaching staff at any time during the term by using the contact details provided in this guide. Students should expect a response within 1-2 business days. Teaching staff are unable to accept assessment submissions via email, all assessments must be submitted as outlined in the unit guide.

For all university related correspondence, students must use their official Macquarie University student email account which may be accessed via the [Macquarie University Student Portal](#). Inquiries from personal email accounts will not be attended to.

Academic Honesty

Using the work or ideas of another person, whether intentionally or not, and presenting them as your own without clear acknowledgement of the source is called [Plagiarism](#).

Macquarie University promotes awareness of information ethics through its [Academic Honesty Policy](#). This means that:

- all academic work claimed as original must be the work of the person making the claim
- all academic collaborations of any kind must be acknowledged
- academic work must not be falsified in any way

- when the ideas of others are used, these ideas must be acknowledged appropriately.

All breaches of the [Academic Honesty Policy](#) are serious and penalties apply. Students should be aware that they may fail an assessment task, a unit or even be excluded from the University for breaching the Academic Honesty Policy.

Examples of Academic Dishonesty

Examples of some dishonest behaviours include deception, fabrication, obstruction, plagiarism and sabotage.

Deception includes:

- falsely claiming to have contributed to a group task or presenting collaborative work as one's own without acknowledging others' contributions
- falsely claiming to have submitted an assignment when this was not the case
- collusion (work together with someone else in a deceitful way to develop a submission for an assessment which has been restricted to individual effort)
- submission of a work previously submitted for another unit or another assessment, even if this is the student's own work
- creating a new article out of an existing article by rewriting/reusing it,
- cheating in an examination or asking someone else to complete an assessment or examination in one's place.

Plagiarism involves using the work or ideas of another person, whether intentionally or not, and presenting this as your own without clear acknowledgement of the source of the work or ideas. This includes, any of the following:

- copying part(s) of any document or audio-visual material or computer code or website content without indicating their origins
- using or extracting another person's concepts, experimental results, or conclusions
- summarising or paraphrasing another person's work
- submitting substantially the same final version of any material as another student in an assignment where there was collaborative preparatory work
- use of others (paid or otherwise) to conceive, research or write material submitted for assessment (eg ghost writing)
- submitting the same or substantially the same piece of work for two different tasks or in different units (self-plagiarism).

Sabotage includes, but is not limited to, theft of work, destruction of library materials.

Fabrication involves creating false data, citation(s), or reports.

Obstruction involves intentionally impeding or interfering with another student's academic work

The University may commence applicable disciplinary procedures if a person who breaches the Academic Honesty Policy.

Turnitin

To uphold principles of Academic Honesty, Macquarie University employs online anti-plagiarism Software called [Turnitin](#). Turnitin compares electronically submitted papers to a database of academic publications, internet sources and other student papers that have been submitted to the system to identify matching text. It then produces an Originality Report which identifies text taken from other sources, and generates a similarity percentage.

All text based assessments must be submitted through Turnitin as per instructions provided in the unit guide. It is the student's responsibility to ensure that work is submitted correctly prior to the due date. This includes verifying that correct files have been submitted as no special consideration will be given to students who have uploaded incorrect documents. No hard copies of assessments will be accepted and only Turnitin records will be taken as records of submission.

Multiple submissions may be possible via Turnitin prior to the final due date and time of an assessment task and originality reports may be made available to students to view and check their levels of similarity prior to making a final submission. Students are encouraged to use these reports to ensure that they do not breach they Academic Honesty Policy through high levels of similarity (plagiarism).

Students should note that the report on the initial submission will be immediate but on a second or subsequent submission it will take at least 24-36 hours for the similarity report to be generated. This may be after the due date so students should plan any resubmissions carefully. If you have not planned your submission time carefully and note high levels of similarity in your work after the due date, you can still resubmit your work, however a late penalty (20% per day) will apply. For instructions on how to resubmit your work please see "Resubmissions after the due date" section in this unit guide.

Teaching staff will use the report to judge whether plagiarism has occurred and whether penalties should apply for breaches of the Academic Honesty Policy. Any similar text identified by Turnitin will be considered carefully to see if it is indeed a breach of the Academic Honesty Policy.

There is no set percentage which indicates whether plagiarism has occurred; all identified matching text should be reconsidered carefully. If plagiarism has occurred or is suspected and resubmission is possible prior to the due date, students are advised to edit their work before making a final submission. Help may be sought from teaching staff. Students may also access [re search resources](#) provided by the library or [Learning Skills](#).

Please refer to these instructions on [how to submit your assignment through Turnitin](#) and access similarity reports and feedback provided by teaching staff.

Should you have questions about Turnitin or experience issues submitting through the system, you must inform your teacher immediately. If the issue is technical in nature may also lodge a [OneHelp](#) Ticket, refer to the [IT help page](#).

Submission of Drafts through Turnitin.

In some instances students may be required to submit drafts of written work via Turnitin **prior to the due date of the assessment** task so that they can receive feedback prior to making a final submission. If the student does not make a final submission prior to the due date, their draft will be counted as the final submission or late penalties applied.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Written Tests</u>	10%	No	Lesson 2 - Week 2 to week 6
<u>Assignments</u>	15%	No	W3L6, W6L6
<u>Practical Exams</u>	35%	No	W2L4, W4L4, W6L4
<u>Final Exam</u>	40%	Yes	MUIC Final Examination Period

Written Tests

Due: **Lesson 2 - Week 2 to week 6**

Weighting: **10%**

Written tests will be 20-minute paper-based, closed-book tests containing 2 to 3 short programming questions based on the relevant topic. The students will complete the exercises individually in class. There are five (5) written tests conducted in lessons 2 of weeks 2 to 6. Each written test is worth 2%.

Students are not allowed to use any electronic devices during the tests.

Feedback will be provided in class on the answer booklets.

If students miss a written test, they should refer to the Special Consideration section above.

On successful completion you will be able to:

- Apply enhanced problem solving skills to develop algorithms
- Implement programs (from algorithms), showing an understanding of the underlying architecture of the computer
- Adhere to standard software engineering practices (in particular documentation using Javadoc, testing using JUnit framework and debugging using Eclipse debugger)
- Compare different methods available to solve the same problem in terms of efficiency and other criteria.
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

Assignments

Due: **W3L6, W6L6**

Weighting: **15%**

There are two Assignments in WCOM125. In Assignments, students are given a programming task including multiple sub-problems of incremental nature (such that they need to solve one sub-problem before moving on to the next). Students analyse the problem and solve each sub-problem to move on to the "next stage". JUnit tests indicate that their solutions are correct or not, as they implement their solution. Thus, 80% feedback is provided live to them, including where and what the mistake is. 20% marks are for coding style and the feedback for that is provided in the class after the due date.

Assignment 1 will be a programming assignment that will require students to write Java code to meet a set of requirements. The task will help students to practise concepts from lesson 1.1 to 2.4. Students' code will be assessed via automated tests that will be provided to students. Students will also be marked on code quality and completeness. This task is worth 5%.

Assignment 2 will be a programming assignment that will require students to write Java code to meet a set of requirements. The task will help students to practise concepts from session 2.4 to 4.4. Students' code will be assessed via automated tests that will be provided to them. They will also be marked on code quality and completeness. This task is worth 10%.

NOTE: Submissions that do not compile correctly shall be marked at the academic judgement of the teaching staff and a penalty may be applied.

Assignments are submitted to links provided in iLearn. These are individual tasks. Further instructions are available in iLearn. Please refer to late submission section above.

Due dates are:

Assignment 1: week 3 lesson 6, 23:45 (11:45pm)

Assignment 2: week 6 lesson 6, 23:45 (11:45pm)

On successful completion you will be able to:

- Apply enhanced problem solving skills to develop algorithms
- Implement programs (from algorithms), showing an understanding of the underlying architecture of the computer
- Adhere to standard software engineering practices (in particular documentation using Javadoc, testing using JUnit framework and debugging using Eclipse debugger)
- Compare different methods available to solve the same problem in terms of efficiency and other criteria.
- Use discipline specific terminology to communicate concepts and ideas relevant to this

unit

Practical Exams

Due: **W2L4, W4L4, W6L4**

Weighting: **35%**

There are two Practical Exams in WCOM125. Practical exams include short programming tasks based on relevant content. Each practical exam is an Eclipse project containing the questions, with JUnit test provided for each question. These are closed-book online exams.

Students are allowed to use javadoc of libraries.

Practical Exam 1 (5%) may cover any unit material from session 1.1 to 2.2. This is a 40-minute exam, conducted in lesson 2.4.

Practical Exam 2 (10%) may cover any unit material from session 1.1 to 3.4. This is a 75-minute exam, conducted in lesson 4.4.

Practical Exam 3 (20%) may cover any unit material from session 1.1 to 5.4. This is a 90-minute exam, conducted in lesson 6.4.

Instant feedback will be provided through JUnit tests. This is an individual student task.

If students miss a practical exam, they should refer to the Special Consideration section above.

On successful completion you will be able to:

- Apply enhanced problem solving skills to develop algorithms
- Implement programs (from algorithms), showing an understanding of the underlying architecture of the computer
- Adhere to standard software engineering practices (in particular documentation using Javadoc, testing using JUnit framework and debugging using Eclipse debugger)
- Compare different methods available to solve the same problem in terms of efficiency and other criteria.

Final Exam

Due: **MUIC Final Examination Period**

Weighting: **40%**

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

The Final Exam is a 2 (two) hours plus 10 (ten) minutes, closed book, paper-based, and individual assessment task. It includes a mix of short programming questions and code analysis questions.

The Final exam is a hurdle assessment task. Students must pass the final exam in order to pass the unit. In order to pass the final exam, students must obtain at least 40 out of 100 possible marks (40%). Where students have not obtained the minimum mark required, but have made a

serious attempt at this assessment task, they will be given one further opportunity to meet the hurdle requirement. In this unit, a serious attempt is defined as obtaining at least 30% (i.e. Between 30 and 39 out of the possible 100 marks, inclusive). Where a student is given the additional opportunity and does not attain at least 40% (40/100) they will be deemed not to have met the hurdle requirement and will subsequently not pass the unit.

The final examination period is from Thursday Week 6 until Monday of Week 7, including the weekend. This means that examinations and assessments may be held/due on the Saturday during the final examination period and students must be available to take exams and submit assessments on this day. Details of the structure and format of the final examination paper will be made available to students prior to the start of the final examination period.

Students are **not** allowed to bring mobile phones and other electronic devices; notes and course materials; dictionaries (paper/electronic); and calculators. A reference sheet will be provided.

If students miss the final exam, they should refer to the Special Consideration section above.

On successful completion you will be able to:

- Apply enhanced problem solving skills to develop algorithms
- Implement programs (from algorithms), showing an understanding of the underlying architecture of the computer
- Adhere to standard software engineering practices (in particular documentation using Javadoc, testing using JUnit framework and debugging using Eclipse debugger)
- Compare different methods available to solve the same problem in terms of efficiency and other criteria.
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

Delivery and Resources

Term Dates & College Calendar

Details of key dates during the term can be found on the [Important Dates](#) calendar.

Enrolment and Timetables

General timetable information is available via Macquarie University's [Timetable page](#).

Students will be able to enrol in units and register for classes via [eStudent](#) and also view their personal timetable. It is the student's responsibility to ensure that classes they have registered for do not clash.

Students are only permitted to attend classes in which they have registered via eStudent, unless they have written approval from the Students Services and Administration Manager. To seek approval, students must email muic@mq.edu.au or speak to a member of the Student Services and Administration Team at E3A Level 2 Reception. Approval will only be granted in exceptional circumstances.

The last day to enrol in units is Tuesday of Week 1. Swapping groups is not possible after the enrolment period has concluded. The last day to enrol and register into classes is Tuesday of Week 1 and this must be finalised by the student in [eStudent](#) by the end of the day.

Guest Lecturer Presentations and Workshops

One or two Guest Lecturer Presentations and/or workshops may be scheduled during the term. These sessions will take place outside of regular class time, usually in a lecture theatre on campus. In the session a speaker (usually an expert or well-known academic in the field) will give a presentation on a particular topic related to the unit or field.

While attendance at guest lectures is not compulsory, and content covered is not examinable unless covered in regular classes, students are strongly encouraged to attend these sessions as they will:

- help them to engage with and broaden their understanding of the discipline
- contextualise content covered in class by providing insights into recent research and workplace developments in the field
- provide opportunities for networking
- provide experience of what lectures are like

Specific details including time and venue for Guest Lecturer Presentations and workshops will be posted in iLearn announcements and provided in class.

Recordings of these sessions may also be made available to students via iLearn.

Attendance Requirements – All Students

All students are expected to attend 100% of scheduled class time.

Attendance will be monitored in each lesson & students will be able to see their current attendance percentage to date and potential attendance percentage for each unit they have enrolled in via [iLearn](#).

- **Current attendance Percentage** will reflect the percentage of classes a student has attended so far (based only on the lessons held to date).
- **Potential Attendance Percentage** will reflect the percentage of classes a student can potentially attend by the end of the term, taking into consideration lessons attended and assuming the student also attends all future lessons scheduled (based only on the total number of lessons in the Term).

Where a student is present for a part of a lesson (for example arrives late, leaves early, leaves the class frequently, particularly for lengthy periods) the teacher reserves the right to mark a student absent for that part of the lesson.

In cases of unavoidable non-attendance due to illness or circumstances beyond their control, students should lodge an application for special consideration [ask.mq.edu.au](#) within 5 working days and supply relevant supporting documentation, even if they have not missed a formal

assessment task. This will ensure that that appropriate records of unavoidable absences can be kept.

Public Holidays and Make-up Lessons

If any scheduled class falls on a public holiday a make-up lesson may be scheduled on an alternate day, usually on a Saturday or a weekday at a time when students do not have other classes scheduled.

In Term January there will be two public holidays for which make-up lessons will be scheduled.

New Year's Day (01/01/2018): Make up lessons will be scheduled on Saturday 6th January.

Australia Day (26/01/2018): Make up lessons will be scheduled on Saturday 20th January.

Technology Used and Required

- Access to internet (Available on Campus using Macquarie [OneNet](#) and in designated E3A Self-Access Computer Laboratories)
- [iLab](#) - iLab is Macquarie University's personal computer laboratory on the Internet, enabling students to use the Microsoft Windows applications they require to do their university work from anywhere, anytime, on anything.
- Access to [iLearn](#) Access to Macquarie University [Library catalogue \(MultiSearch\)](#)
- Access to Microsoft Office Suite (available in E3A Self-Access Computer Laboratories and via [iLab](#))software downloads page for full instructions.

Bringing your own Device (BYOD)

Macquarie University is BYOD (Bring Your Own Device) friendly and it encourages students to bring their Windows or Mac devices to use on campus and during classes.

In some classes in this unit, you will need to have access to a mobile device, Office applications (Word, Excel and PowerPoint) and an Internet Browser of your choice. If you do not have your own device and computer access is required in a particular lesson, you may be able to borrow a laptop to use for the duration of the lesson.

As a Macquarie University student, you are entitled to free access to Microsoft Office Suite, which you can download for use on your device. Please visit the University's [software downloads page](#) for full instructions.

If you do bring your own device, you will need to ensure that it is sufficiently charged as access to power points will not be available in the classrooms.

iLearn

[iLearn](#) is Macquarie's online learning management system and a principal teaching and learning resource which will be used throughout the term. Students must access iLearn at least 3 times per week to access important information including:

- Announcements and News Forums - Teaching staff will communicate to the class using iLearn announcements. Announcements may also be emailed to students' Macquarie University email address but students should check the News Forum regularly.
- Attendance – current and potential attendance percentage for the Term.
- Unit Guide and staff contact details
- Set unit readings available through [MultiSearch](#) (library).
- Lesson materials and recordings where available
- Learning and teaching activities and resources, questions and solutions
- Assessment instructions, questions, marking criteria and sample tasks
- Assessment submission links such as Turnitin
- Links to support materials and services available at the University
- Evaluation Surveys for the unit

For any resource related iLearn questions contact your teacher. For any technical or support issues using iLearn, please contact the IT helpdesk (Ph. 02 9850 4357) or lodge a ticket using [OneHelp](#).

Useful Study Resources

[StudyWise](#) is an iLearn resource created by Learning Skills, which is specifically designed to help you to manage your studies, strengthen your study techniques, write effective assignments and improve your English language proficiency. Once you enrol in StudyWISE, you can access it from your iLearn course list under the category "Student Support".

[InfoWise](#) will help you improve your research skills by teaching you how to use MultiSearch, decode citations, identifying key search terms and use advanced search techniques.

[Lib Guides](#) provide students with links to electronic sources and websites that are good starting points for research in different fields or disciplines.

[MultiSearch](#) will connect you to Macquarie University Library and allow you to search library resources, databases, unit readings and past exam papers

[Academic Language and Learning Workshops](#) are designed to help you with Study Skills, Assignment Writing, Referencing and Academic Language.

[Research resources](#) provide information about:

- [Researching for your assignments](#)
- How to [manage your references](#)
- [Referencing style guides](#)
- [Subject and research guides](#)

[Numeracy Support](#) is provided by the [Numeracy Centre](#). Students who can attend these support classes on a drop in basis as required.

Unit Schedule

The four modules in WCOM125 are,

1. Classes and objects (CO)
2. Searching and sorting (SS)
3. Recursion and time complexity (RTC)
4. Data structures (DS)

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 Java 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.

Week	Lesson	Topic	Learning objectives	Learning outcomes addressed	Readings	Assessment dates
1	1,2	Introduction	Introduce the java programming language, compiler, and program structure.	1,2,3,4	Textbook Chapters 1, 2, 3	New Year's Day (01/01/2018) is a public holiday. Make up lessons will be scheduled on Saturday 6th January for affected classes.
	3,4	Problem solving with arrays and methods (functions)	Revise WCOM115/COMP115 arrays and functions	1,2,3,4,5	Readings on arrays and functions provided	
	5,6	Testing and debugging java programs	Introduction to Eclipse debugger and Junit test suite	1,2,3,4,5	lecture notes	
2	1,2	Classes and objects - 1	Classes and objects - analysis, design, getters, setters and clients	1,2,3,4,5	Textbook Chapter 4	Written test 1 (in Lesson 2)
	3,4	Classes and objects - 2	Constructors, compareTo	1,2,3,4,5	Textbook Chapter 4	Practical Exam 1 (in Lesson 4)

	5,6	Classes and objects - 3	Objects containing an array, Arrays of objects, Arrays of objects containing an array	1,2,3,4,5	Textbook Chapter 4	
3	1,2	Searching and Sorting - 1	Linear and binary search, associated time complexities	1,2,3,4,5	Textbook Chapter 6 Section 2	Written test 2 (in Lesson 2)
	3,4	Searching and Sorting - 2	Selection sort and time complexity	1,2,3,4,5	Textbook Pages 420-423	
	5,6	Searching and Sorting - 3	Insertion sort and time complexity	1,2,3,4,5	Textbook Pages 420-423	Assignment 1 due Lesson 6, 11.45 pm)
4	1,2	Recursion - 1	Concept of recursion and benefits	1,2,3,4,5	Textbook Chapter 11	Written test 3 (in Lesson 2)
	3,4	Recursion - 2	Recursion with Strings and arrays	1,2,3,4,5	Textbook Chapter 11	Practical exam 2 (in Lesson 4)
	5,6	Lists - 1 (Java's built-in ArrayList class)	Introduction to Lists, discussion of ArrayList class and methods applicable on ArrayList objects	1,2,3,4,5	Textbook Chapter 14 Section 1	Australia Day (26/01/2018) is a Public Holiday. Make up lessons will be scheduled on Saturday 20th January for affected classes.
5	1,2	Lists - 2 (Custom-built ArrayList)	Implementing the core of ArrayList class (access, insertion, deletion)	1,2,3,4,5	lecture notes	Written test 4 (in Lesson 2)
	3,4	Lists - 3 (Custom-built LinkedList class - 1)	Introduction to recursive class Node and manipulating Node objects to create a linked list	1,2,3,4,5	Textbook Chapter 15 Section 1	
	5,6	Lists - 4 (Custom-built LinkedList class - 1)	Implementing the core of LinkedList class (access, insertion, deletion)	1,2,3,4,5	lecture notes	
6	1,2	Recursion - 3	More advanced recursive algorithms operating on Node and CustomLinkedList classes	1,2,3,4,5	Readings on recursive design of permutations provided	Written test 5 (in Lesson 2)
	3,4	Review - 1				Practical Exam 3 (in Lesson 4)
	5,6	Review - 2				Assignment 2 due (Lesson 6, 11.45 pm) Final Exam during the MUIC Final Examination Period

Learning and Teaching Activities

Lessons

Lessons will include a mixture of learning and teaching activities. New content and topics will be

presented in lessons, and students will be given problems, practice questions and other interactive activities to apply the knowledge and the skills gained in the lesson. Students will be required to take notes, complete set class tasks and engage in discussion and individual and group activities. In class, specific time may be dedicated to work on assessment tasks and students will be given guidance and feedback to complete these. Certain lessons may be dedicated to independent research and reading related to the unit whether in the classroom or a computer lab.

Active Participation

Students will be required to not only attend but also actively participate in lessons. Active participation entails: - active engagement in class activities - contribution to class discussions by asking and answering questions - coming to class prepared and having completed required pre-readings and activities - completion of set class and homework activities - collaboration with other students - adhering to Macquarie University Student Codes of Conduct

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](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.*)

Undergraduate students seeking more policy resources can visit the [Student Policy Gateway \(https://students.mq.edu.au/support/study/student-policy-gateway\)](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 \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](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 shown in *iLearn*, 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](#).

Academic Honesty

Using the work or ideas of another person, whether intentionally or not, and presenting them as your own without clear acknowledgement of the source is called [Plagiarism](#).

Macquarie University promotes awareness of information ethics through its [Academic Honesty Policy](#). This means that:

- all academic work claimed as original must be the work of the person making the claim
- all academic collaborations of any kind must be acknowledged
- academic work must not be falsified in any way
- when the ideas of others are used, these ideas must be acknowledged appropriately.

All breaches of the [Academic Honesty Policy](#) are serious and penalties apply. Students should be aware that they may fail an assessment task, a unit or even be excluded from the University for breaching the Academic Honesty Policy.

Assessment Policy

Students should familiarise themselves with their responsibilities under the [Assessment Policy](#), and notably [Schedule 4](#) (Final Examination Requirements).

Final Examination Script Viewings

A student may request to view their final examination script once results have been released but scripts remain the property of Macquarie University.

Students should view their final examination paper prior to submitting a grade appeal, if this is relevant to their case. The viewing will be conducted in a secure location under supervision.

To request a final examination script viewing, please email: muic@mq.edu.au and write 'script viewing' in the subject heading.

Scripts may be reviewed for up to 6 months following the results release date for the relevant Term.

Grade Appeals

A student who has been awarded a final grade for a unit has the right to appeal that grade as outlined in the [Grade Appeal Policy](#). Grade appeals apply to the final mark and grade a student receives for a unit of study. They do not apply to results received for individual assessment tasks.

Grade appeals must be submitted via [ask.mq.edu.au](#) within 20 working days from the published result date for the relevant unit. Before submitting a Grade Appeal, please ensure that you read

the [Grade Appeal Policy](#) and note valid grounds for appeals.

Students are expected to seek feedback on individual assessment tasks prior to the award of a final grade. Students also have the right to request generic feedback from the teaching staff on their overall performance in the unit, including in a final examination. This can be done at any time in the six month period starting from the day on which the final grade of the relevant unit is published.

Course Progression

The College closely monitors students' academic progress as per the [Progression Policy](#) for Programs delivered by Macquarie University International College.

To maintain Satisfactory Academic Progress, a student must successfully complete (pass) 50% or more of their enrolled units in a Term of study. To successfully complete a unit, students must obtain a passing grade and meet any other requirements to pass listed in the unit guide.

Students who fail to make Satisfactory Academic Progress will be classified as "at risk" and will be notified in writing. At-risk students may be required to undergo academic counselling, undertake certain initiatives or have conditions placed upon their enrolment to help them make satisfactory progress.

Students must also pass 50% or more of the units in 2 or more terms in order to meet Minimum Rate of Progress (MRP) requirements. A student is deemed not to be making Minimum Rate of Progress if they fail more than 50% of their enrolled units in two consecutive Terms of study, or if they have failed more than 50% of their units after studying two or more terms.

Any domestic student who has been identified as not meeting Minimum Rate of Progress requirements will be issued with an Intention to Exclude letter and may subsequently be excluded from the program.

Any international student who has been identified as not meeting MRP will be subject to exclusion from the program and be issued with an Intention to Report letter and may subsequently be reported to the Department of Immigration and Border Protection (DIBP) for not meeting visa requirements. International students must comply with the [Progression Policy](#) of the College in order to meet the conditions of their visa.

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 improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)

- [Ask a Learning Adviser](#)

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

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.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcomes

- Apply enhanced problem solving skills to develop algorithms
- Adhere to standard software engineering practices (in particular documentation using Javadoc, testing using JUnit framework and debugging using Eclipse debugger)
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

Assessment tasks

- Written Tests
- Assignments
- Practical Exams

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

- Implement programs (from algorithms), showing an understanding of the underlying architecture of the computer
- Compare different methods available to solve the same problem in terms of efficiency and other criteria.

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Apply enhanced problem solving skills to develop algorithms
- Implement programs (from algorithms), showing an understanding of the underlying architecture of the computer
- Adhere to standard software engineering practices (in particular documentation using Javadoc, testing using JUnit framework and debugging using Eclipse debugger)
- Compare different methods available to solve the same problem in terms of efficiency and other criteria.
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

Assessment tasks

- Written Tests
- Assignments
- Practical Exams
- Final Exam

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to

have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Apply enhanced problem solving skills to develop algorithms
- Implement programs (from algorithms), showing an understanding of the underlying architecture of the computer
- Adhere to standard software engineering practices (in particular documentation using Javadoc, testing using JUnit framework and debugging using Eclipse debugger)
- Compare different methods available to solve the same problem in terms of efficiency and other criteria.

Assessment tasks

- Assignments
- Practical Exams
- Final Exam

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Apply enhanced problem solving skills to develop algorithms
- Implement programs (from algorithms), showing an understanding of the underlying architecture of the computer
- Adhere to standard software engineering practices (in particular documentation using Javadoc, testing using JUnit framework and debugging using Eclipse debugger)
- Compare different methods available to solve the same problem in terms of efficiency and other criteria.
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

Assessment tasks

- Written Tests
- Assignments

- Practical Exams
- Final Exam

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcome

- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

Assessment task

- Final Exam

Changes from Previous Offering

The number of contact hours per week has been increased from 11 hours to 12 hours. The format of lessons have changed to 6 x 2-hour lessons per week.

Course Contact Hours

Weekly face to face contact for this unit will be 12 hours 72 hours per term).

There will be 6 lessons per week consisting of 3 X 2 hour lessons in a classroom and 3 X 2 hour lessons in the MUIC PC Laboratory.

Unit Specific Texts and Materials

The following text has been prescribed for this unit.

- **T. Gaddis, Starting out with Java: From control structures through objects (Pearson), Global edition (6th). ISBN 9781292110653**

Texts will be available for purchase from the [Co-Op Bookshop](#) located in the Campus Hub Building C10A, Level One, Phone: 8986 4000.

All students should ensure that they have access to the prescribed text(s) from the start of the Term as failure to do so could jeopardise their academic progress in this unit.

Other editions or formats of the above resource(s) may be acceptable, but you must students must consult teaching staff prior to purchasing these.

The following books are helpful references:

- 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 (this book will also be used in COMP225)
- D. Carlson, [Eclipse Distilled](#) (Addison-Wesley) 1st edition. ISBN 9780321288158 (extensive coverage of the software development platform eclipse)