



# WCOM115

## Introduction to Computer Programming

MUIC Term 2 2016

*Macquarie University International College*

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#### **Disclaimer**

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

## General Information

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Credit points

3

Prerequisites

Corequisites

Co-badged status

Unit description

This unit is an introductory computer science unit, providing a practical introduction to basic computing and programming concepts. Students gain an understanding of, and practical experience in, computer programming; practical experience in implementing informal prose descriptions of problem solutions using an imperative language; an understanding of, and practical experience in, designing, coding, testing and debugging simple algorithms; and an understanding of the principle of incremental development. Other topics include: the concept of program correctness; the differences between high-level languages, assembly languages and machine languages; the role played by compilers; and the execution of programs by computer hardware. Together with ISYS114 Introduction to Systems Design and Data Management, this unit forms the entry point for mainstream computing units.

## 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:

- Describe the main components of a computer system and the role that different kinds of programming language play in computer software development
- Apply problem solving skills to develop algorithms that solve small to medium-sized computational problems
- Use an imperative programming language to implement these algorithms and document, debug and test the implementations using standard software engineering practices.
- Identify and describe ethical issues that arise in the application of information technology
- 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:

- Pass the final examination or final assessment task
- Achieve a Standard Numerical Grade (SNG) of 50 or more in the unit
- Attend at least 80% of scheduled classes

For further details about grading, please refer to the [Grading Policy](#).

### Submission of Assessment Tasks

Assessments must be submitted following instructions provided in class. 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.

### Turnitin

Turnitin compares electronically submitted papers to a database of academic publications, internet sources and other papers that have been submitted into the system to identify matching text. It then produces an Originality Report which identifies text taken from other sources, and generates a similarity percentage to judge whether plagiarism has occurred (see Academic Honesty section below).

Multiple submissions may be possible via Turnitin prior to the due date of an assessment and originality reports may be made available to students. In such cases they should be used to

check work for plagiarism prior to a final submission. As a general guideline, a similarity percentage of below 15% will probably indicate that plagiarism has not occurred. However, if there is a matching block of text then this could be considered plagiarism unless it has been correctly referenced.

Where there is a requirement for assessment tasks to be submitted through Turnitin, it is the student's responsibility to ensure that work is submitted correctly prior to the due date. Hard copies will not be accepted unless indicated otherwise by a teaching staff member. Records in Turnitin will be taken as records of submission. For assistance submitting through Turnitin, you may approach your teacher, lodge a [OneHelp](#) Ticket, refer to the [IT help page](#) or seek assistance from [Student Connect](#).

Students should note that for a first time submission the Originality Report will be available immediately post submission but for any subsequent submissions it will take 24 hours for the report to be generated. This may be after the due date so students should plan their submission carefully.

## Missed Assessments

The University recognises that students may experience unexpected events and circumstances that adversely affect their academic performance in assessment activities, for example illness. In order to support students who have experienced a serious and unavoidable disruption, the University will provide affected students with an additional opportunity to demonstrate that they have met the learning outcomes of a unit. An additional opportunity provided under such circumstances is referred to as special consideration.

The [Disruption to Studies Policy](#) applies only to *serious and unavoidable* disruptions that arise after a study period has commenced. Students with a pre-existing disability/health condition or prolonged adverse circumstances may be eligible for ongoing assistance and support. Such support may be sought through [Campus Wellbeing](#) and [Support Services](#).

**Serious and Unavoidable Disruption** The University classifies a disruption as **serious and unavoidable** if it:

- could not have reasonably been anticipated, avoided or guarded against by the student; and
- was beyond the student's control; and
- caused substantial disruption to the student's capacity for effective study and/or completion of required work; and
- occurred during an event critical study period and was at least three (3) consecutive days duration, and / or
- prevented completion of a final examination.

To be eligible for Special Consideration, a student must notify the University of a *serious and unavoidable* disruption within five (5) working days of the commencement of the disruption (Disruption to Studies notification). All Disruption to Studies notifications are to be made online via the University's [Ask MQ](#) system. A Disruption to Studies notification must be supported by

documentary [evidence](#).

In submitting a Disruption to Studies notification, a student is acknowledging that they may be required to undertake additional work. The time and date, deadline or format of any required extra assessable work as a result of a disruption to studies notification is not negotiable and in submitting a disruption to studies notification, a student is agreeing to make themselves available to complete any extra work as required.

Please refer to the [Disruption to Studies Policy](#) for further details.

## Extensions & Late Submissions

To apply for an extension of time for submission of an assessment item, students must submit a Disruptions to Studies notification via [ask.mq.edu.au](http://ask.mq.edu.au).

Late submissions without an approved extension are possible but will be penalised at 20% per day up to 4 days (weekend inclusive). If a student submits an assessment task 5 or more days after the due date without grounds for special consideration (See [Disruptions to Studies Policy](#)) a record or submission will be made but the student will receive zero marks for the assessment task.

## Final Examinations and Final Assessment Tasks

Final exams and final assessments will typically take place in Week 6 or Monday of Week 7. All students enrolled in a teaching session are expected to ensure they are available up until and including Monday of Week 7 to undertake examinations. Passing the final exam or final assessment task is a requirement to pass this unit.

Details of teaching session dates can be found on the [Important Dates](#) calendar. Due dated for assessments will be available in the unit guide and final examination timetables will be released to students prior to Week 5.

Planning for an exam is very important. All students should be familiar with the [Exam Rules](#). In addition, students should refer to the below links for other important examination related information.

- [Talk to your lecturer](#)
- [Revision tips](#)
- [What to bring with you](#)
- [What not to bring with you](#)
- [Where to get help](#)
- [Tips for Success](#)

It is not uncommon for students to have two examinations in one day.

## Conduct During Assessments and Examinations

Students must adhere to the [Student Code of Conduct](#) and [Academic Honesty Policy](#) at all times.

Students will be provided with instructions relating to conduct during in-class assessment tasks. For all examinations, students will be required to:

- provide photographic proof of identity for the duration of the examination. This must be visible at all times during the examination.
- leave mobile phones, electronic devices, bags, computers, notes, books and similar items outside a final examination venue or in a designated space
- ensure any water brought into the examination room is in a clear and unmarked bottle
- obey all instructions provided by an Examination Supervisor
- refrain from communicating in any way with another student once they have entered the examination venue.

Students are NOT permitted:

- into an examination venue once one hour from the time of commencement (excluding any reading time) has elapsed
- to leave an examination venue *before* one hour from the time of commencement (excluding any reading time) has elapsed
- to be readmitted to an examination venue unless they were under approved supervision during the full period of their absence
- to obtain or attempt to obtain assistance in undertaking or completing the examination script
- to receive or attempt to receive assistance in undertaking or completing the examination script.

Students should also ensure they follow all requirements of the [Final Examination Policy](#).

## Supplementary Examinations

Supplementary final examinations are held during the scheduled Supplementary Final exam Period. This may fall in Week 7 or within the first week of the subsequent teaching term. Results for supplementary exams 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 should note that formal completion of their Diploma 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.

## Retention of Originals

It is the responsibility of the student to retain a copy of any work submitted and produce another copy of all work submitted if requested. 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.

The University may request and retain the originals of any documentation or evidence submitted to support notifications of disruptions to studies. 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.

## Contacting Teaching Staff and Obtaining Help and Feedback

Students may contact teaching staff at any time during the term by using the contact details provided in this guide.

For all university related correspondence, students are required to 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.

Students may seek additional feedback at any time during the term and general feedback about their performance in a unit up to 6 months following results release.

## Assessment Tasks

Name	Weighting	Due
<a href="#">Assignment One</a>	6%	Lesson 3.2
<a href="#">In-class exercises</a>	10%	Lesson 1.2 to 6.1
<a href="#">Assignment Two</a>	24%	Lesson 6.1
<a href="#">Module Exams</a>	60%	Various

### Assignment One

Due: **Lesson 3.2**

Weighting: **6%**

The assignments are programming exercises that allow skills to be demonstrated by solving a more substantial problem than in the weekly exercises. Assignment One is a relatively simple exercise that is designed to begin building competency in using the Processing language to solve problems.

On successful completion you will be able to:

- Apply problem solving skills to develop algorithms that solve small to medium-sized computational problems
- Use an imperative programming language to implement these algorithms and document,

debug and test the implementations using standard software engineering practices.

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

## In-class exercises

Due: **Lesson 1.2 to 6.1**

Weighting: **10%**

In-class exercises will alternate between a quiz and practical submission. Duration of quizzes and time allocated to complete the practical task will vary based on complexity of the problem, but will be between 30 minutes and 1 hour.

On successful completion you will be able to:

- Apply problem solving skills to develop algorithms that solve small to medium-sized computational problems
- Use an imperative programming language to implement these algorithms and document, debug and test the implementations using standard software engineering practices.
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

## Assignment Two

Due: **Lesson 6.1**

Weighting: **24%**

Assignment Two builds on the first assignment and the practical work to reinforce the basics of programming and includes some of the more advanced aspects that are covered in the second half of the unit.

On successful completion you will be able to:

- Apply problem solving skills to develop algorithms that solve small to medium-sized computational problems
- Use an imperative programming language to implement these algorithms and document, debug and test the implementations using standard software engineering practices.
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

## Module Exams

Due: **Various**

Weighting: **60%**

The module examinations ask students to answer conceptual questions about the course



material as well as solve simple programming problems. Module exams are run in the first hour of the workshop in which the student is enrolled. Students may only attend module exams in workshops they are enrolled in. In the case a student cannot attend a module exam, [a request for special consideration](#) must be made.

Six module examinations are each offered up to four times during semester. The student's best mark for each module is used in their final mark.

The exam mark for each module is worth 10% of the final mark.

Students must demonstrate satisfactory performance in modules 1-5 to pass the course.

Satisfactory performance is defined as getting more than 40% on any one of the module exams offered for that module. A student's final mark for a module is the maximum mark they achieved in any of the module exams for that module.

On successful completion you will be able to:

- Describe the main components of a computer system and the role that different kinds of programming language play in computer software development
- Apply problem solving skills to develop algorithms that solve small to medium-sized computational problems
- Use an imperative programming language to implement these algorithms and document, debug and test the implementations using standard software engineering practices.
- Identify and describe ethical issues that arise in the application of information technology
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

## **Delivery and Resources**

### **Scheduled Class Time & Timetables**

Weekly face to face contact for this unit will be 9 hours consisting of 3 x 3 hour lessons (54 hours per term).

Students will be able to enrol in their classes and view their personal timetable via eStudent and may also view general timetable information via Macquarie University's [Timetable page](#).

If any scheduled class falls on a public holiday a make-up lesson may be scheduled. Where appropriate, the instructor may instead organise an online make-up lesson which would require students to access online learning materials and/or complete activities outside of class rather than attending a make-up lesson. Scheduled make-up days will be announced in class and attendance will be taken for both for face to face and online make-up lessons.

### **Attendance Requirements - All students**

All students are required to attend at least 80% of scheduled class time to pass this unit.

Attendance will be monitored in each lesson & students will be able to see their attendance

records for a unit via iLearn.

Where a student is present for a part of a lesson (for example arrives late, leaves early, leaves the class frequently or for lengthy periods, engages in inappropriate or unrelated activities or does not participate actively in the majority of the lesson) the teacher reserves the right to mark a student absent for that part of the lesson.

**Because of the intensive nature of this program, students should be aware that their attendance in this unit may fall below 80% relatively quickly.**

In cases of unavoidable non-attendance due to illness or circumstances beyond control, students should lodge a [Disruption to Studies](#) Notification via [ask.mq.edu.au](http://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 made.

For further information on attendance, please refer to the [Attendance and Study Load Policy](#).

## iLearn

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

- Announcements - Teaching staff will communicate to the class using iLearn announcements.
- A link to the unit guide for the unit and staff contact details
- Lecture notes and recordings where available
- Learning and teaching activities and resources
- Assessment information
- Tutorial questions and solutions
- Assessment submission tools such as Turnitin
- Other relevant material

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

## Required and Recommended Texts and Materials

'Learning Processing', 2nd edition

Author: Daniel Shiffman

Publisher: Morgan Kauffmann

ISBN 978-0123944436

### Technology Used and Required

- Access to internet (Available on Campus using Macquarie [OneNet](#))

- Access to [iLearn](#)
- Access to Macquarie University [Library catalogue](#)
- Access to Microsoft Office Word and Excel (available in Labs)

## Unit Schedule

The unit is broken into six modules

- Pixels and Variables (PV)
- Conditionals (C)
- Loops (L)
- Functions (F)
- Arrays and Strings (AS)
- Program Design and Problem Solving (PDPS)

Each of the first 5 module (PV, C, L, F, AS) cover one skill which is absolutely necessary to program a computer. Thus each student must demonstrate a satisfactory performance in each of these modules to pass the course. Satisfactory performance in a module is defined in the assessment tasks section. The final module (PDPS) synthesises the skills learned in the other modules. Student performance in this module is important to their final grade and to demonstrate they have reached the level of mastery required to pass, but less than satisfactory performance in this module does not preclude a student from passing (as it does for the other modules).

Module exams are offered five times during semester giving students more than one opportunity to demonstrate satisfactory performance in each module.

Lesson	Topic	Learning objectives	Learning outcomes addressed	Module exams	Resources required (textbook readings)	Assignment dates
1.1	Introduction, Pixels, Shapes (Pixels and variables – 1)	Develop an understanding of computer system, components, and software execution. Introduce the notion of drawing as a computation process.	1, 2, 3		Chapter 1, Chapter 2	
1.2	Data types, variables, arithmetic operators, animation (Pixels and variables – 2)	Introduce the process of generating animation using sequential images, need to remember status indicators such as locations, speeds, size; and storing them in appropriately-typed variables.	1, 2, 3		Chapters 3, 4	

2.1	Expressions, computations (Pixels and variables – 3)	Develop an understanding of arithmetic operators, precedence, expression types.	1, 2, 3, 5		Chapters 3, 4	Assignment 1 released
2.2	Conditionals	Introduce decision-making capabilities in the form of conditional statements	1, 2, 3, 5		Chapter 5	
3.1	Loops - 1	Introduce capability to perform repetitive tasks often required in projects such as drawing chess grids or patterns or iterating through a sequence of numbers	1, 2, 3, 5	PV, C	Chapter 6	
3.2	Loops - 2, Functions - 1	Discuss some more advanced repetition structures and introduce the notion of <i>functions</i> that enable us to write a piece of code that performs a specific job and use that at multiple places in the program	1, 2, 3, 5		Chapter 6, 7	Assignment 1 due
4.1	Functions - 2	Extend the discussion on functions and demonstrate some more clever uses of the same, for example, nested function calls.	1, 2, 3, 5	PV, C, L	Chapter 7	Assignment 2 released
4.2	Program Design & Problem Solving - 1, Ethics in IT	Describe standard software development techniques such as top-down and incremental. Discuss the role of ethics in the context of information technology.	1, 2, 3, 4, 5		Chapter 10	
5.1	Arrays and Strings - 1	Demonstrate the need to remember multiple values, that are all members of a <i>set</i> . Introduce arrays and strings as programming structures that enable us to remember these values and operate on them when required.	1, 2, 3, 5	L, F, AS	Chapters 9, 17	
5.2	Arrays and Strings - 2	Demonstrate advanced uses of arrays such as passing arrays to functions and functions returning an array.	1, 2, 3, 5		Chapters 9, 17	
6.1	Program Design and Problem Solving - 2	Describe a systematic process of program design and problem solving through a live project development.	1, 2, 3, 5	F, AS, PDPS	Chapter 10	Assignment 2 due
6.2	Revision	Go through the topics covered during the semester	1, 2, 3, 4, 5	PV, C, L, F, AS, PDPS		

Note: Each session is structured as a 3-hour lesson followed by a 3-hour practical. Depending on timetabling issues, the practical may or may not be on the same day.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

New Assessment Policy in effect from Session 2 2016 <http://mq.edu.au/policy/docs/assessm>

[ent/policy\\_2016.html](#). For more information visit [http://students.mq.edu.au/events/2016/07/19/new\\_assessment\\_policy\\_in\\_place\\_from\\_session\\_2/](http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/)

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of 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/support/student\\_conduct/](https://students.mq.edu.au/support/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](http://ask.mq.edu.au).

### Attendance

Please refer to Attendance Requirements (above) and the MUIC [Attendance and Study Load Policy](#). Attendance requirements have been explained in further detail in the Delivery and Resources section above.

## Academic Honesty

All staff and students must abide by the principles of academic honesty as outlined in the [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.

If you are unsure about how to incorporate scholarly sources into your own work, speak to your teacher or [Student Connect](#) prior to your assessment due date. You may also enrol in [StudyWis](#)

e or visit the University's [Library Webpage](#) for more resources.

## Final Examination Script Viewings and 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 Standardised Numerical Grade (SNG) a student receives for a unit of study. They do not apply to results received for individual assessment tasks.

A student is expected to seek feedback on individual assessment tasks prior to the award of a final grade. In particular, a student is expected to view their final examination paper in advance of submitting a grade appeal, if this is relevant to their case. To request a final examination script viewing, please lodge a ticket via [ask.mq.edu.au](http://ask.mq.edu.au).

Grade appeals must be submitted via [ask.mq.edu.au](http://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 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 academic progress as per the [Progression Policy](#).

To maintain Satisfactory Academic Progress, a student must successfully complete 50% or more of their enrolled units in a study Term. To successfully complete a unit, students must meet the requirements to pass as 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 student 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 subjects 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 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 requirement and be subject to exclusion from the program. International students must comply with the [MUIC Progress Policy](#) 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](http://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](http://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/](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 problem solving skills to develop algorithms that solve small to medium-sized computational problems
- Use an imperative programming language to implement these algorithms and document, debug and test the implementations using standard software engineering practices.

## Assessment tasks

- Assignment One
- In-class exercises
- Assignment Two
- Module Exams

## 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

- Describe the main components of a computer system and the role that different kinds of programming language play in computer software development
- Apply problem solving skills to develop algorithms that solve small to medium-sized computational problems
- Use an imperative programming language to implement these algorithms and document, debug and test the implementations using standard software engineering practices.
- Identify and describe ethical issues that arise in the application of information technology
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

## Assessment tasks

- Assignment One
- In-class exercises
- Assignment Two
- Module Exams

## 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 problem solving skills to develop algorithms that solve small to medium-sized computational problems
- Use an imperative programming language to implement these algorithms and document, debug and test the implementations using standard software engineering practices.
- Identify and describe ethical issues that arise in the application of information technology

## Assessment tasks

- Assignment One
- In-class exercises
- Assignment Two
- Module Exams

## 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 problem solving skills to develop algorithms that solve small to medium-sized computational problems
- Use an imperative programming language to implement these algorithms and document, debug and test the implementations using standard software engineering practices.

## Assessment tasks

- Assignment One
- In-class exercises
- Assignment Two
- Module Exams

## 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 outcomes**

- Describe the main components of a computer system and the role that different kinds of programming language play in computer software development
- Identify and describe ethical issues that arise in the application of information technology
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

## **Assessment tasks**

- Assignment One
- In-class exercises
- Assignment Two
- Module Exams

## **Changes from Previous Offering**

not applicable

## **Changes since First Published**

<b>Date</b>	<b>Description</b>
29/02/2016	Contact details of teachers are updated.