COMP1010
Fundamentals of Computer Science

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

School of Computing

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General Information

Unit convenor and teaching staff
Convenor and Lecturer (weeks 7-12)
Bernard Mans
bernard.mans@mq.edu.au
TBA

Lecturer (weeks 1-6)
Gaurav Gupta
gaurav.gupta@mq.edu.au
TBA

Credit points
10

Prerequisites
(COMP1000 or COMP115) or admission to (BActStud or BActStudBSc or BAppFinBActStud
or BActStudBProfPrac)

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:

ULO1: apply enhanced problem solving skills to develop algorithms
ULO2: implement programs from algorithms, showing an understanding of the
underlying architecture of the computer
ULO3: adhere to standard software engineering practices, including documentation, unit
testing and debugging
ULO4: compare different methods available for the same problem in terms of efficiency and other criteria

ULO5: demonstrate foundational learning skills including active engagement in their learning process

**General Assessment Information**

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

### Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly submissions</td>
<td>20%</td>
<td>Yes</td>
<td>weeks 2-11</td>
</tr>
<tr>
<td>Quizzes</td>
<td>20%</td>
<td>No</td>
<td>Weeks 6, 10 and 12 (First 30 minutes of lecture)</td>
</tr>
<tr>
<td>End-of-semester exam</td>
<td>30%</td>
<td>No</td>
<td>Weeks 14-15</td>
</tr>
<tr>
<td>Assignments</td>
<td>30%</td>
<td>No</td>
<td>Weeks 3, 8 and 13</td>
</tr>
</tbody>
</table>

**Weekly submissions**

Assessment Type: Practice-based task
Indicative Time on Task: 20 hours
Due: weeks 2-11
Weighting: 20%

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

Weekly submissions from the practice package provided. To clear the hurdle, students must submit at least 8 out of 10 submissions that satisfy the minimum requirements, which may be different for each week.

On successful completion you will be able to:
- apply enhanced problem solving skills to develop algorithms
On successful completion you will be able to:

- implement programs from algorithms, showing an understanding of the underlying architecture of the computer
- compare different methods available for the same problem in terms of efficiency and other criteria
- demonstrate foundational learning skills including active engagement in their learning process

**Quizzes**

Assessment Type 1: Quiz/Test  
Indicative Time on Task 2: 16 hours  
Due: **Weeks 6, 10 and 12 (First 30 minutes of lecture)**  
Weighting: **20%**

Online quizzes to assess the understanding of the several topics taught throughout the unit. Students get only one attempt for each quiz.

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
- compare different methods available for the same problem in terms of efficiency and other criteria
- demonstrate foundational learning skills including active engagement in their learning process

**End-of-semester exam**

Assessment Type 1: Examination  
Indicative Time on Task 2: 10 hours  
Due: **Weeks 14-15**  
Weighting: **30%**

End of semester exam to assess achievement of learning outcomes from the entire session.

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
• compare different methods available for the same problem in terms of efficiency and other criteria
• demonstrate foundational learning skills including active engagement in their learning process

Assignments
Assessment Type 1: Programming Task
Indicative Time on Task 2: 39 hours
Due: Weeks 3, 8 and 13
Weighting: 30%

Take-home assignments during the semester to assess problem-solving skills in the domain of the unit topics.

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, including documentation, unit testing and debugging
• compare different methods available for the same problem in terms of efficiency and other criteria
• demonstrate foundational learning skills including active engagement in their learning process

1 If you need help with your assignment, please contact:
   • the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
   • the Writing Centre for academic skills support.

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

CLASSES

Each week you should attend

- two hours of lectures (details to be announced via iLearn),
- two hour practical class

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

Note that Lectures and Practical classes commence in week 1.

You should have selected a practical class during enrolment. You should attend the practical class in which you are enrolled. You won't always get the class of your choice. Check availabilities via eStudent regularly. If ALL practical classes are full, only then, contact the convenor.

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

TEXTS AND/OR MATERIALS

Lecture notes, Practical classes and Video tutorials: details to be announced via iLearn

Recommended Textbooks:

   - Online edition of this book is available through MQ Library. There can be up to 5 simultaneous accesses. Click on "Full text available at: 2018 eTextbooks" and login with OneID and password.


TECHNOLOGY USED AND REQUIRED

Audio and Video Lecture

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

Technology

- Java SE - download the latest Java SE to be compatible with the labs.
- Eclipse (preferred, troubleshooting provided) or Visual Studio Code (if you are proficient,
independent) - the IDEs we shall be using during the session.

- Learning Management System **iLearn**.
- [https://code2flow.com/](https://code2flow.com/) for better understanding of control flow.

### Discussion Boards

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

## Unit Schedule

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**. The use of JUnit testing framework is an important development practice that 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.

### Unit Schedule

**NOTE:** This is a tentative schedule and subject to minor changes.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Pre-lecture readings from Lecture Notes (COMP1010)</th>
<th>Assessments Due</th>
<th>Weekly submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Programming environment</td>
<td>1, 2</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Problem-solving, JUnit testing</td>
<td>3, 4</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Classes and Objects - 1</td>
<td>5, 6, 7</td>
<td>Assignment 1 (Arrays) - 5%</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Classes and Objects - 2</td>
<td>8, 9, 10</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Week</td>
<td>Topic</td>
<td>Notes</td>
<td>Assignment</td>
<td>Notes</td>
</tr>
<tr>
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<td>-------------------------------------------</td>
<td>------------------------</td>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td>5</td>
<td>Recursion - 1</td>
<td>11, 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Recursion - 2</td>
<td>13, 14, 15</td>
<td>Quiz 1 (Classes) - 5%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>First 30 minutes of lecture</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>List Interface,</td>
<td>16, 17, 18</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ArrayList class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>2 weeks’ recess</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Sorting Algorithm(s)</td>
<td>TO DO</td>
<td>Assignment 2 (Classes) - 10%</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>Stacks and Queues</td>
<td>TO DO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Recursive data structures - 1</td>
<td>21</td>
<td>Quiz 2 (Recursion) – 7%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>First 30 minutes of lecture</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Recursive data structures - 2</td>
<td>22</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Assembly Programming</td>
<td>TBA</td>
<td>Quiz 3 (ArrayList class) - 8%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>First 30 minutes of lecture</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>-</td>
<td></td>
<td>Assignment 3 (Recursive data structures) - 15%</td>
<td>No</td>
</tr>
<tr>
<td>14, 15</td>
<td>Final Exam – 30%</td>
<td></td>
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**Policies and Procedures**

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

- **Academic Appeals Policy**
- **Academic Integrity Policy**
- **Academic Progression Policy**
- **Assessment Policy**
- **Fitness to Practice Procedure**
- **Assessment Procedure**
- **Complaints Resolution Procedure for Students and Members of the Public**
- **Special Consideration Policy**

Students seeking more policy resources can visit [Student Policies](https://students.mq.edu.au/su).
Student Support

It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.edu.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing and maths support, academic skills development and wellbeing consultations.

Student Support

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

The Writing Centre

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- Access StudyWISE
- Upload an assignment to Studiosity
- Complete the Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian
Student Services and Support

Macquarie University offers a range of **Student Support Services** including:

- **IT Support**
- **Accessibility and disability support** with study
- **Mental health support**
- **Safety support** to respond to bullying, harassment, sexual harassment and sexual assault
- **Social support including information about finances, tenancy and legal issues**

Student Enquiries

Got a question? Ask us via **AskMQ**, or contact **Service Connect**.

IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/](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.