COMP155 Introduction to Computer Science (Advanced)

Study Guide

Semester 1, 2006

Division of Information and Communication Sciences
COMP155 Introduction to Computer Science

Course Aims

COMP155 Introduction to Computer Science, provides an introduction to basic computing and programming concepts. Students will gain an understanding of, and practical experience in, analysing problems, designing algorithms, coding, testing and debugging programs to address these problems. They will have the technical competence to write simple programs in C++.

Other topics include the ethics in IT, the concept of program correctness, good programming style and documentation, the role of compilers and the execution of programs by computer hardware.

COMP155 is the advanced stream of COMP115. The assessment is strictly the same as for COMP115. The examination and assignments are the same and the marking will be done in a uniform way. Only the lectures, tutorials and practicals are different and are designed to offer the opportunity to the strongest students to learn quickly and more effectively in an appropriate environment.

If you have a UAI of 84.35 or above or are enrolled in BCompSci you must enrol in COMP155. If your UAI is close to 84.35, talk to the convenor of COMP155 (Dr. Yan Wang, E6A339), we recommend you to enrol in COMP155.

Objectives

On completion of this unit, students should be able to:
- demonstrate good problem solving skills
- design and implement algorithms for simple problems
- show extensive experience in programming, testing and debugging
- understand the importance of software development life-cycle

Staff

Yan Wang
E6A339
Unit Convenor, Lecturer
yanwang@ics.mq.edu.au
Consultation Times: Fri 3 to 6pm

Kate Stefanov
E6A341
9850 6345
First Year Liaison Officer
kate@ics.mq.edu.au
Consultation Times: See below First Year Support

Lisa Chanell
E6A314
9850 9314
Administrator
Monday to Friday 9.30 am to 12noon and 2.00pm to 4.00pm
comp155-admin@ics.mq.edu.au

Course Material

Material relating to the course will be posted on the Web at:

http://online.mq.edu.au/pub/COMP155/
Lecture Summaries, Tutorial Questions, Practical Questions and Assignments will be posted on the Web.

Textbook


This textbook is available as a shrink-wrapped package from the University Co-op Bookshop. This textbook will also be used in COMP125/COMP165 Fundamentals of Computer Science.

Note that D. S. Malik, C++ Programming: Program Design Including Data structures (2nd Edition), Thomson Course Technology, 2004 can also be used.

First Year Support

As first year students, you will find that Uni life is a lot different than life in High school or anywhere else you might be coming from. While it offers a lot more freedom and fun, it also presents new and often, bigger challenges. To help you have a smooth transition, the Computing Department has appointed a First Year Student Support Officer for all students enrolled in first year units offered by the Department. Kate Stefanov can be contacted via e-mail at studentsupport@comp.mq.edu.au, by calling 9850 9571 or drop in to see her in E6A371.

Timetable

Students should attend 3 hours of lectures, a one hour tutorial and a one hour practical each week.

Lectures

Day students: Mon 4 pm, Tue 2 pm, Fri 2 pm respectively in E7B 264, E7B264 and E5A131

Tutorials

commence in Week 2

Wed 13 pm at E8A386

Practicals

commence in Week 1
time selected at enrolment

Check the timetable-maker

Workload

COMP155 is a three-credit point unit. It is therefore expected that a student will spend approximately 12 hours per week on this unit throughout the semester. Since there are five hours of timetabled classes, this means you can expect to spend around seven hours working on COMP155 outside of class.

You should note that it is extremely unlikely that the practical and assignment work can be completed solely within your scheduled practical class time – you are expected to complete this work at other times.

Assessment

There are 3 components:

Practicals 10%
In order to pass the unit (i.e. obtain a grade of PC or better) you are required to submit satisfactory attempts to at least eight of the twelve weekly practicals, two of the three assignments AND to perform satisfactorily in the final examination.

Practicals

Each week there will be one exercise (selected among all the practical exercises for that week) that students must solve. The solution (in the form of a C++ program) will be submitted electronically and automarked out of 1. The best 10 marks will be kept.

Note also that students are required to pass electronically at least 8 of the indicated weekly practical exercises and 2 of the assignments to be eligible for special considerations.
Assignments

There are 3 assignments. Students must submit satisfactory attempts at 2 of the assignments.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Topic</th>
<th>Available</th>
<th>Checkpoint</th>
<th>Due</th>
<th>Worth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Simple</td>
<td>Week 1</td>
<td>Week 3</td>
<td>Week 4</td>
<td>5%</td>
</tr>
<tr>
<td>2</td>
<td>Functions</td>
<td>Week 4</td>
<td>Week 7</td>
<td>Week 8</td>
<td>7%</td>
</tr>
<tr>
<td>3</td>
<td>Arrays</td>
<td>Week 8</td>
<td>Week 11</td>
<td>Week 12</td>
<td>8%</td>
</tr>
</tbody>
</table>

The assignments are a significant amount of work. You are unlikely to be able to do them in the week before they are due.
Note that assignments are usually set over the lecture break.

The assessment of assignments relies on 2 important components:
- Automarking (Your program will be run with some input and the obtained output will be compared to the correct expected one).
- Handmarking (Prac tutors will assess the correctness and the quality of your code).

To help you to complete your assignments on time, a review will be organized before your assignment is due for you to obtain feedback on your program and allow you to correct your code if necessary.

Submission of Assignments

Assignments are to be submitted electronically via the submit link on the unit web page. You should submit your work early and often.
Because of the checkpoint that is an opportunity to submit your program in advance and obtain some feedback, the deadline for the assignments is strict and there will be no extension.
Note that crowded laboratories, equipment failure or loss of your files are not valid reasons not to submit your assignment.

You are encouraged to:
(i) keep backups of all your important files
(ii) ensure someone else does not pick up your printouts

A new plagiarism detection scheme will be used this year.
Note that you will receive negative marks if you are involved in plagiarism.
Make sure that you submit your own work. Do not share your code with someone else.

You must not send your assignments to lecturers by email in case the submit system crashes.

Final Examination

A three hour written examination will be held at the end of semester. It will consist of 3 sections:
Section A will consist of multiple choice questions
Section B will consist of simple programming questions
Section C will consist of programming questions

Note that performing well in Section A only will not be sufficient to pass the unit. An adequate performance in each of Sections A, B and C will be required to pass the unit.
**Weekly Lecture Schedule**

Lectures are given by Yan Wang

<table>
<thead>
<tr>
<th>Week/ Date/ Lecturer</th>
<th>Lecture Topic</th>
<th>Reading (chapters applicable to lectures)</th>
<th>Assignments/ Exams</th>
</tr>
</thead>
</table>
| **Week 1** From Feb 27 | Introduction  
Overview of computers and computer science.  
Simple C++ programs. | Malik Chap 1, 2 | Assignment 1 available |
| **Week 2** From Mar 6 | Program Design and Implementation  
Basic Elements of C++. Input/Output | Malik Chap 2, 3 |  |
| **Week 3** From Mar 13 | Selection  
Control Structures | Malik Chap 4 | Checkpoint for assignment 1  
March 13th |
| **Week 4** From Mar 20 | Iteration  
While and For loops | Malik Chap 5 | Assignment 1 due  
March 22nd 11pm  
Assignment 2 available |
| **Week 5** From Mar 27 | Iteration (cont)  
Nested loops Pitfalls. | Malik Chap 5 |  |
| **Week 6** from April 3 | User-defined Functions | Malik Chap 6, 7 |  |
| **Week 7** from April 10 | User-defined data types  
Introduction to Classes | Malik Chap 8, 12 | Checkpoint for assignment 2  
April 10th |

University Mid-Semester Lecture Break 14 - 28 April

| Week 8 From May 1 | Classes | Malik Chap 12, 14 | Assignment 2 due  
May 4th  
Assignment 3 available |
| Week 9 From May 8 | Strings and Arrays | Malik Chap 9 |  |
| Week 10 from May 15 | Arrays : Searching | Malik Chap 10 |  |
| Week 11 from May 22 | Arrays : Sorting | Malik Chap 10 | Checkpoint for assignment 3  
May 22nd |
| Week 12 from May 29 | Program Examples |  | Assignment 3 due  
May 31st |
| Week 13 from June 5 | Revision  
Exam discussion |  |  |

Note that Fri April 14th is a public holiday
The practicals sessions are designed to give you practical experience with the concepts and techniques discussed in lectures and tutorials. Practical Demonstrators will be available to answer questions and to help you use the computers and software. Tutorials are to give you practice in solving problems and to develop the concepts and ideas discussed in the lectures. You should read the readings listed for the week and attempt the tutorial questions before each tutorial.

**Computer Laboratories**

Practical classes are held in the first year laboratories E6A110 and E6A112. You will be issued with a username which begins with the letter ‘s’ followed by the first seven digits of your student number eg s4044999. Your password will be your birth date ddmmyy followed by #changeme eg 050677#changeme (if birthdate is the fifth of June, 1977)

Details of the computing facilities are available at:


The laboratory usage policy is available at:


**Special Consideration**

Ref. http://www.comp.mq.edu.au/undergrad/policies/special_consideration_policy.html or below:

If you have experienced circumstances that you believe have adversely affected your performance in the unit, then you may apply for Special Consideration, as described in the Handbook of Undergraduate Studies 2006 (page 19). You may apply for Special Consideration for assignments as well as for the final examination.

**Special Consideration for the Final Examination**

To be eligible for Special Consideration for the final examination you must have:
1. satisfactorily completed all compulsory requirements of the unit (in particular, all assignments)
2. attached a completed Professional Authority Form to your request
3. provided valid documentary evidence to substantiate your circumstances
4. submitted your request in accordance with the University's regulations (ref. http://www.reg.mq.edu.au/Forms/APSCons.pdf)

If you do not satisfy ALL of these criteria, you cannot expect your request to be considered.

Where, in the view of the Division, you are to be granted Special Consideration for the final examination, you should note the following:
1. you will be required to sit a Special Examination
2. your performance in the final examination, if you sat it, will not be considered
3. your final grade will be based on your assignment marks and your performance in the Special Examination

Failure to sit for the Special Examination will result in a grade of FA being recorded.

**Process**

When you request Special Consideration, you are telling us that your performance has not reflected your true ability. In advising us of these circumstances, you must ensure that you are readily available to be contacted AND you must hold yourself available to sit for the Special Examination at short notice on the date and time we set.

**Notification of Decision**

The outcome of all special consideration requests will be posted on the Department's web-site http://www.comp.mq.edu.au/undergrad/. It is each student's responsibility to check this site for details.

**Purpose**

The purpose of the special examination is to resolve the temporary difficulty caused by your illness or misadventure, and is not to give you an advantage over other students by allowing you extra time to study. We will, therefore, hold the special examination as soon as possible after the final examination, and in determining your
grade, we will take into account the possibility of extra study time available to you.

**Liaison Committee**
There is a Student-Staff Liaison Committee for each unit level, i.e. 100, 200 and 300. Details are available at:


Get involved and have a say about your studies!

**Plagiarism**
The Department is particularly keen to ensure students are aware of its zero tolerance attitude to plagiarism. Link to the Department policy:


**HELP!**
All changes to student’s timetable classes must be done via the Change of Program sessions held during the first few weeks of semester.

General problems or administrative difficulties - see Lisa Chanell or email comp155-admin@ics.mq.edu.au

Note that Lisa Chanell is available on Tuesdays and Thursdays in E6A314 to help with student problems.

Problems with understanding the concepts – firstly consult a tutor during consultation times. If still experiencing difficulties then consult a lecturer during consultation times. You can check consultation times on the web:


**Note:** Only email lecturers if you are unable to attend their consultation hours (you will need a valid reason for your inability to attend e.g. lecture clash, work commitments). A suitable appointment time can then be agreed. Do not email individual questions to lecturers, use the consultation hours – this is what they are for! Also check regularly the information available on the internet (for instance FAQs), they will probably answer your question.

In case the only remaining option that you have is to send an email to the lecturer, make sure that you use your official Macquarie email for that.