MONASH University
Information Technology

FIT2071
Foundations of C++

Unit Guide

Semester 1, 2013

Last updated: 04 Mar 2013

Table of Contents

FIT2071 Foundations of C++ - Semester 1, 2013

Following on from FIT1002, this unit introduces the C++ language to students. The unit extends the FIT1002 concepts into more advanced object-oriented programming topics such as inheritance and polymorphism. C++ streams, pointers and arrays, classes, templates and the STL, along with the I/O class hierarchy will be discussed at length. Interactive programming techniques will be used to solve various programming exercises. The unit will give students a deeper understanding of programming and data structures by introducing recursion and dynamic data structures.

Mode of Delivery

Caulfield (Day)

Contact Hours

2 hrs lectures/wk, 2 hrs tutorials/wk

Workload requirements

Concepts will be introduced and demonstrated in the lecture and will be discussed and put into practice during the laboratory time.

- Lecture: 2 hours per week
- Tutorial/laboratory: 2 hours per week

Additionally, each student should spend a minimum of 8 to 12 hours for personal study every week. This includes finishing laboratory exercises, undertaking further coding examples and completing assignment work.

Unit Relationships

Prerequisites

FIT1040 or FIT1002

Chief Examiner

Dr Matthew Butler

Campus Lecturer

Caulfield

Matthew Butler

Tutors

Caulfield

Matthew Butler

Elliott Wilson

Academic Overview

Learning Outcomes

At the completion of this unit students will:

- demonstrate an understanding of the history and concepts of the C++ language and how C++ relates to other commercial languages, especially Java;
- be able to write programs making use of the features and capabilities of C++, comprising: Streams, Pointers, arrays and vectors, Classes, inheritance and polymorphism, Templates and the Standard Template Library, The I/O class hierarchy;
- be able to write programs involving abstract and dynamic data structures, and implement algorithms for searching, insertion and deletion;
- be able to implement algorithms that utilise recursion;
- be able to use files for persistent storage of data.

Unit Schedule

Week	Activities	Assessment
0		No formal assessment or activities are undertaken in week 0
1	C++ Building Blocks 1: Main, Input/Output, Variables, and Simple Objects	
2	C++ Building Blocks 2: Decisions, Loops, Functions, and Debugging	
3	C++ Building Blocks 3: Arrays, Vectors and the STL	
4	Classes and Objects 1: Declaring, Accessing, Constructors, and Destructors	
5	References and an Introduction to Pointers	Lab Portfolio Submission 1 due: Wednesday 10 April 2013
6	Pointers continued and Memory Management	
7	Classes and Objects 2: Inheritance and Polymorphism	
8	Classes and Objects 3: Heap data members, Friends, Overloading, and Structs	Lab Portfolio Submission 2 due: Wednesday 1 May 2013
9	Recursion and Miscellaneous C++ Concepts	
10	Data Structures and the STL Revisited	
11	Algorithms	Major Assignment due: Friday 24 May 2013
12	Case Study and Revision	
	SWOT VAC	No formal assessment is undertaken in SWOT VAC
	Examination period	LINK to Assessment Policy: http://policy.monash.edu.au/policy-bank/academic/education/assessment/assessment-in-coursework-policy.html

*Unit Schedule details will be maintained and communicated to you via your learning system.

Assessment Summary

Examination (3 hours): 60%; In-semester assessment: 40%

Assessment Task	Value	Due Date
Lab Portfolio Submission 1	10%	Wednesday 10 April 2013
Lab Portfolio Submission 2	10%	Wednesday 1 May 2013
Major Programming Assignment	20%	Friday 24 May 2013
Examination 1	60%	To be advised

Teaching Approach

Lecture and tutorials or problem classes

This teaching and learning approach provides facilitated learning, practical exploration and peer learning.

Assessment Requirements

Assessment Policy

Faculty Policy - Unit Assessment Hurdles
(http://www.infotech.monash.edu.au/resources/staff/edgov/policies/assessment-examinations/unit-assessment-hu

Academic Integrity - Please see the Demystifying Citing and Referencing tutorial at
http://lib.monash.edu/tutorials/citing/

Assessment Tasks

Participation

- **Assessment task 1**

  Title:
  Lab Portfolio Submission 1
  Description:
  This task comprises the first submission of your laboratory portfolio.

  Students will be required to compile a portfolio of major laboratory tasks for submission for
  assessment. Details of each portfolio component are clearly indicated in the laboratory
  tasks for each week.

  This submission contains the weekly folio tasks for Weeks 2 to 4.
  Weighting:
  10%
  Criteria for assessment:
  Explicit assessment criteria will be provided in the assignment brief, however students will
  be assessed on the following broad criteria:

  - Meeting functional requirements as described in the assignment description
  - Demonstrating a solid understanding of C++ concepts, including good practice
  - Demonstrating an understanding of specific C++ concepts relating to the
    assignment tasks, including control structures, object design and implementation,
    and the standard template library
  - Following the unit Programming Style Guide
  - Creating solutions that are as efficient and extensible as possible

  Feedback will be provided on your progress to facilitate for improvements in the second
  set of portfolio pieces.

  Late assignments will incur a 5% penalty per late day (including weekends), and may be
  submitted up to a maximum of 7 days late. After this time submissions will not be
  accepted without prior arrangement with the unit leader.
  Due date:
  Wednesday 10 April 2013

- **Assessment task 2**

  Title:
  Lab Portfolio Submission 2
  Description:
  This task comprises the second submission of your laboratory portfolio.

  Students will be required to compile a portfolio of major laboratory tasks for submission for assessment. Details of each portfolio component are clearly indicated in the laboratory tasks for eack week.

  This submission contains the weekly folio tasks for Weeks 5 to 7.
  Weighting:
  10%
  Criteria for assessment:
  Explicit assessment criteria will be provided in the assignment brief, however students will be assessed on the following broad criteria:

  - ♦ Meeting functional requirements as described in the assignment description
  - ♦ Demonstrating a solid understanding of C++ concepts, including good practice
  - ♦ Demonstrating an understanding of specific C++ concepts relating to the assignment tasks, including advanced object design and implementation, and pointers and memory management
  - ♦ Following the unit Programming Style Guide
  - ♦ Creating solutions that are as efficient and extensible as possible

  Late assignments will incur a 5% penalty per late day (including weekends), and may be submitted up to a maximum of 7 days late. After this time submissions will not be accepted without prior arrangement with the unit leader.
  Due date:
  Wednesday 1 May 2013

- **Assessment task 3**

  Title:
  Major Programming Assignment
  Description:
  Students will be required to complete a major programming assignment, encompassing all concepts covered in the unit. The full assignment brief will be placed on the unit website.
  Weighting:
  20%
  Criteria for assessment:
  Explicit assessment criteria will be provided in the assignment brief, however students will be assessed on the following broad criteria:

  - ♦ Meeting functional requirements as described in the assignment description
  - ♦ Demonstrating a solid understanding of C++ concepts, including good practice
  - ♦ Demonstrating the ability to apply the C++ concepts covered in the unit to a large scale practical example
  - ♦ Following the unit Programming Style Guide
  - ♦ Creating solutions that are as efficient and extensible as possible

  Late assignments will incur a 5% penalty per late day (including weekends), and may be submitted up to a maximum of 7 days late. After this time submissions will not be

accepted without prior arrangement with the unit leader.

Due date:

Friday 24 May 2013

Examinations

- **Examination 1**

Weighting:

60%

Length:

3 hours

Type (open/closed book):

Closed book

Electronic devices allowed in the exam:

None

Remarks:

A sample exam will be made available a month before the examination. Full exam revision will be covered in Week 12.

Learning resources

Monash Library Unit Reading List
http://readinglists.lib.monash.edu/index.html

Feedback to you

Types of feedback you can expect to receive in this unit are:

- Informal feedback on progress in labs/tutes
- Graded assignments with comments
- Interviews
- Solutions to tutes, labs and assignments

Extensions and penalties

Submission must be made by the due date otherwise penalties will be enforced.

You must negotiate any extensions formally with your campus unit leader via the in-semester special consideration process:
http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html.

Returning assignments

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later.

Resubmission of assignments

Students may not resubmit assignments after the due date has passed.

Assignment submission

It is a University requirement (http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-procedures.html) for students to submit an assignment coversheet for each assessment item. Faculty Assignment coversheets can be found at http://www.infotech.monash.edu.au/resources/student/forms/. Please check with your Lecturer on the submission method for your assignment coversheet (e.g. attach a file to the online assignment submission, hand-in a hard copy, or use an online quiz).

Online submission

If Electronic Submission has been approved for your unit, please submit your work via the learning system for this unit, which you can access via links in the my.monash portal.

Recommended Resources

This unit will require the use of a personal computer and a suitable IDE for C++ development. While Visual Studio for Windows will be used in the laboratory environment, any IDE is suitable for outside development. Copies of the Windows operating system and Visual Studio 2010 may be obtained free of charge from http://msdnaa.monash.edu.au/fit

Other Information

Policies

Monash has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards, and to provide advice on how they might uphold them. You can find Monash's Education Policies at: www.policy.monash.edu.au/policy-bank/academic/education/index.html

Key educational policies include:

- Plagiarism;
  http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-policy.html
- Assessment in Coursework Programs;
  http://www.policy.monash.edu/policy-bank/academic/education/assessment/assessment-in-coursework-po
- Special Consideration;
  http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.ht
- Grading Scale;
  http://www.policy.monash.edu/policy-bank/academic/education/assessment/grading-scale-policy.html
- Discipline: Student Policy;
  http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-discipline-policy.html
- Academic Calendar and Semesters; http://www.monash.edu.au/students/dates/
- Orientation and Transition; http://intranet.monash.edu.au/infotech/resources/students/orientation/
- Academic and Administrative Complaints and Grievances Policy;
  http://www.policy.monash.edu/policy-bank/academic/education/management/complaints-grievance-policy.h
- Code of Practice for Teaching and Learning;
  http://www.policy.monash.edu.au/policy-bank/academic/education/conduct/suppdocs/code-of-practice-tead

Graduate Attributes Policy

http://www.policy.monash.edu/policy-bank/academic/education/management/monash-graduate-attributes-policy.ht

Student services

The University provides many different kinds of support services for you. Contact your tutor if you need advice and see the range of services available at http://www.monash.edu.au/students. For Sunway see http://www.monash.edu.my/Student-services, and for South Africa see http://www.monash.ac.za/current/.

Monash University Library

The Monash University Library provides a range of services, resources and programs that enable you to save time and be more effective in your learning and research. Go to www.lib.monash.edu.au or the library tab in my.monash portal for more information. At Sunway, visit the Library and Learning Commons at http://www.lib.monash.edu.my/. At South Africa visit http://www.lib.monash.ac.za/.

Disability Liaison Unit

Students who have a disability or medical condition are welcome to contact the Disability Liaison Unit to discuss academic support services. Disability Liaison Officers (DLOs) visit all Victorian campuses on a regular basis.

Website: http://www.monash.edu/equity-diversity/disability/index.htmlTelephone: 03 9905 5704 to book an appointment with a DLO; or contact the Student Advisor, Student Commuity Services at 03 55146018 at SunwayEmail: dlu@monash.eduDrop In: Equity and Diversity Centre, Level 1, Building 55, Clayton Campus, or Student Community Services Department, Level 2, Building 2, Monash University, Sunway Campus

Your feedback to Us

Monash is committed to excellence in education and regularly seeks feedback from students, employers and staff. One of the key formal ways students have to provide feedback is through the Student Evaluation of Teaching and Units (SETU) survey. The University's student evaluation policy requires that every unit is evaluated each year. Students are strongly encouraged to complete the surveys. The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

For more information on Monash's educational strategy, see:

www.monash.edu.au/about/monash-directions and on student evaluations, see: www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html

Previous Student Evaluations of this Unit

Previous feedback for the unit has been very positive, so many of the aspects have been left the same. In the past students have particualrly liked the assignment structure as well as a focus on more fun game-like activities. New assignments have been created in this format, to encourage further engagement with the content.

Students also responded positively to the lectures being primarily focused on working through code and examples, rather than simply running through dot points from slides. This will continue this year, with a greater focus placed on real-time coding and interactivity with students rather than running through slides.

Some students highlighted the previous problem of having labs before the lectures, therefore this has been addressed. The workload of the assignments had also been raised by a handful of students, so this has been looked at and addressed as well.

If you wish to view how previous students rated this unit, please go to https://emuapps.monash.edu.au/unitevaluations/index.jsp