MONASH University
Information Technology

**FIT1002
Computer programming**

Unit Guide

Semester 2, 2010

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Table of Contents

FIT1002 Computer programming - Semester 2, 2010

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Introduction

Welcome to FIT1002 Computer Programming. This 6 point unit is core to all undergraduate degree programs in the Faculty of Information Technology.

The unit has been designed to provide you with an overview of programming, problem solving, testing and debugging. It explores many fundamental programming concepts with emphasis on applying theoretical knowledge to a practical situation.

Unit synopsis

This unit will provide students with an overview of programming and its role in problem-solving and strategies for meeting user requirements and for designing solutions to programming problems. The fundamental programming concepts of the memory model, data types, declarations, expressions and statements, control structures, block structure, modules, parameters and input and output will be applied within the context of objects, attributes, methods, re-use, information-hiding, encapsulation and message-passing. Software engineering topics include maintainability, readability, testing, documentation and modularisation.

Learning outcomes

At the completion of this unit students will have -
An understanding of:

- the relationship between a problem description and program design;
- the management of problems using recognised frameworks;
- the use of design representations;
- the semantics of imperative programs;
- the object oriented paradigm as represented by Java;
- the sequence of steps that a computer takes to translate source code into executable code; and
- primitive data types and basic data structures.

Developed attitudes that enable them to:

- adopt a problem-solving approach;
- recognise the importance of programming and documentation conventions;
- appreciate quality parameters in program development;
- accept the code of professional conduct and practice; and
- act in accordance with best practice, industry standards and professional ethics.

Developed the skills to:

- use diagrams to design solutions for programming problems;
- apply problem solving strategies;
- use pseudo-code to design algorithms;
- design object oriented solutions to simple problems using multiple user-defined classes;
- create and test programming solutions to problems using the Java programming language;
- edit, compile and execute a computer program;
- analyse and debug existing programs; and
- write a test plan.

Demonstrated the communication skills necessary to:

- produce formal documentation for a program; and
- explain an existing program.

Contact hours

2 hrs lectures/wk, 2 hrs laboratories/wk, 1 hr tutorial/wk

Workload

For on campus students, workload commitments are:

- two hours of lectures
- one-hour tutorial class in a flat room without computers to discuss theoretical programming concepts and develop problem solving strategies
- two-hour laboratory (practical class) (requiring advance preparation)
- a minimum of 2-3 hours of personal study **per one hour of lecture time** in order to satisfy the reading, tute, prac and assignment expectations.
- You will need to allocate up to 5 hours per week in some weeks, for use of a computer, including time for newsgroups/discussion groups.

Off-campus students generally do not attend lecture, tutorial and laboratory sessions, however, you should plan to spend equivalent time working through the relevant resources and participating in discussion groups each week.

Unit relationships

Prohibitions

CPE1001, CSE1202, GCO1811, MMS1801, MMS1802

Teaching and learning method

Teaching approach

This unit will be delivered via two one hour lectures. Lecturers may go through specific examples, give demonstrations and present slides that contain theoretical concepts.

In tutorials students will discuss in-depth fundamental and interesting aspects about programming which will help them complete their practical work. The tutorials are particularly useful in helping students consolidate concepts and practise their problem solving skills.

Laboratories will be devoted to giving students hands-on experience in implementing a programming solution to a practical problem.

Timetable information

For information on timetabling for on-campus classes please refer to MUTTS, http://mutts.monash.edu.au/MUTTS/

Tutorial allocation

On-campus students should register for tutorials/laboratories using the Allocate+ system: http://allocate.its.monash.edu.au/

Off-Campus Learning or flexible delivery

Off-Campus students should treat the Study Guide Book (consisting of 11 modules) as their primary source for self-directed study. The modules contain text which is directed to leading you through the learning for each week. Please read the welcome message in the Study Guide Book for further detail.

Online Discussion Forums are provided for the primary purpose of enabling off-campus students (including students studying at SPACE in Hong Kong) to engage with each other and the lecturer in Australia. The lecturer will expect all students to read these forums at least twice per week and issues raised in the forum are examinable. In the forums, you may ask questions about the topics or exercises of each module, or to clarify interpretation of assignment tasks and marking criteria.

Unit Schedule

Week	Date*	Topic	Study guide	Key dates
1	19/07/10	Unit Administration and Introduction	1	
2	26/07/10	Algorithms, Variables and Data Types	2	
3	02/08/10	Using objects and classes, Math Class, String Class, Random Class and I/O	3	
4	09/08/10	Selection	4	Assignment 1 due end of lab session (5%)
5	16/08/10	Repetition	5	
6	23/08/10	Modularisation	6	Mid semester test (10%)

FIT1002 Computer programming - Semester 2, 2010

7	30/08/10	Classes and Objects	7	
8	06/09/10	Methods revisited	8	Card Class forms part of Assignment 2. Tutors will check student progress in the lab
9	13/09/10	Object references	9	Player Class forms part of Assignment 2. Player Class forms part of Assignment 2. Tutors will check student progress in the lab
10	20/09/10	Arrays	10	
Mid semester break				
11	04/10/10	Case study: Multiple classes	11	Deck Class Exercise forms part of Assignment 2. Deck Class forms part of Assignment 2. Tutors will check student progress in the lab
12	11/10/10	Campus specific week	11	Assignment 2 Due Fri 15th Oct(15%)
13	18/10/10	Exam Revision		

*Please note that these dates may only apply to Australian campuses of Monash University. Off-shore students need to check the dates with their unit leader.

Improvements to this unit

Improvements we have made to the unit from last year include:

1. Modification to lecture notes for better flow of information

2. Redevelop some of the tutorial and laboratory exercises to focus on activities directly related to the assignment;

3. Allocate marks for interviews.

4. Campus lecturers to organise advance tutorial groups if that campus requires it.

Unit Resources

Prescribed text(s) and readings

Lewis J., DePasquale P., and Chase J., *JAVA Foundations*., Pearson Education, 2008, ISBN 0-321-48678-1

Text books are available from the <u>Monash University Book Shops</u>. Availability from other suppliers cannot be assured. The Bookshop orders texts in specifically for this unit. You are advised to purchase your text book early.

Recommended text(s) and readings

For all students:

Malik D.S., *Java Programming - From Analysis to Design.*, Thomson Learning 2006, ISBN 0619216085

Robertson LA, *Simple Program Design*, 5th ed., Thomson/Nelson, 2007, ISBN 017010704-3

 For student with advanced programming skills:

Arnold K., Gosling J. & Holmes D., *The Java Programming Language*, Fourth Edition, Addison-Wesley, Upper Saddle River, NJ, 2006.   ISBN 0-321-34980-6 (paperback)

Required software and/or hardware

Java Development Kit, Version j2sdk-1_5_0_06 or later, Sun Microsystems, Inc.

Students should have access to at least one of the following Integrated Development Environments listed below.

The FIT1002 lecturers recommend jCreator for students with no programming experience. This is the development environment installed on all campus computers:

- **Jcreator** - jcreator LE v4.0 is a powerful IDE (Integrated Development Environment) for Java and is strongly recommended. It can be downloaded from the Web Site: http://www.jcreator.com/ Students are advised to download the freeware version. There is no need for the fuller facilities provided in JcreatorPro.

For students that have programming experience and wish to continue with programming as part of Bachelor of Computer Science or Bachelor of Software Engineering, we recommend:

- **Eclipse** (latest version) downloaded from http://eclipse.org.

Other development environments students that are available for students to use are:

- **jEdit** - Text editor written in Java which can auto indent and provides syntax highlighting for more than 130 languages. http://www.jedit.org/
- **BlueJ,** Version 2.1.2 Programming Development Environment. Although available on CD, version 2.1.3 can be downloaded from http://www.bluej.org

Equipment and consumables required or provided

Students studying off-campus are required to have the minimum system configuration specified by the faculty as a condition of accepting admission, and regular Internet access. On-campus students, and those studying at supported study locations may use the facilities available in the computing labs. Information about computer use for students is available from the ITS Student Resource Guide in the Monash University Handbook. You will need to allocate up to 12 hours per week for use of a computer, including time for newsgroups/discussion groups.

Study resources

Study resources we will provide for your study are:

- A MUSO unit web site where lecture slides, weekly tutorial and practical requirements, assignment specifications, and supplementary material will be available
- Discussion groups via MUSO for Off-Campus Learning (OCL) students. The OCL students will liaise with their lecturer via the discussion board for assistance.
- An electronic Unit Book containing the Study Guide Modules for the unit
- This Unit Information outlining the administrative information for the unit

Additionally, students studying by Off-Campus Learning mode will receive:

- A CD-ROM sent at the start of the semester, with software required for their units
- Printed version of the Unit Book containing the Study Guide Modules for the unit.

Assessment

Overview

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

Faculty assessment policy

To pass a unit which includes an examination as part of the assessment a student must obtain:

- 40% or more in the unit's examination, and
- 40% or more in the unit's total non-examination assessment, and
- an overall unit mark of 50% or more.

If a student does not achieve 40% or more in the unit examination or the unit non-examination total assessment, and the total mark for the unit is greater than 50% then a mark of no greater than 49-N will be recorded for the unit.

The unit is assessed with three assignments, a one hour mid-semester test and a three hour closed book examination. Furthermore:

- students must attempt and submit all internal assessment tasks, and
- students must participate in at least **ten** tutorial and **ten** practical classes. Participation will be monitored. Students unable to attend classes should contact their on-campus lecturer immediately. Students missing classes repeatedly may be contacted by lecturer to explain their absence.

Assignment tasks

Assignment coversheets

Assignment coversheets are available via "Student Forms" on the Faculty website:
http://www.infotech.monash.edu.au/resources/student/forms/
You MUST submit a completed coversheet with all assignments, ensuring that the plagiarism declaration section is signed.

Assignment submission and return procedures, and assessment criteria will be specified with each assignment.

Assignment submission and preparation requirements will be detailed in each assignment specification. 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.

- **Assignment task 1**

    Title:
    Assignment 1 - JAVA basics
    Description:
    This assignment will aim to help you to develop programs in Java using classes and objects that are able to read input from the user and format output. You will also learn to use classes and their methods that are available from the Java library.

Weighting:
> 5%

Criteria for assessment:
> Detailed assessment criteria will be issued along with the assignment.

> 1. All programs must run and compile correctly. Evidence of testing is required.
> 2. Programs must meet the problem specification
> 3. JAVA code should be readable and maintainable and follow the style recommended in the prescribed text book.
> 4. Programs should be documented
> 5. Students should be able to answer questions about their own work

Due date:
> End of Lab week 4 (For OCL students ONLY- Mon 9th August)

- **Assignment task 2**

Title:
> Assignment 2 - Designing a JAVA application involving many classes and array of objects

Description:
> This assignment will require students to use the selection and iteration control structures and methods. Students will also be expected to design UML class diagrams and write Java code to solve a problem that will involve many classes and an array of objects.

Weighting:
> 15%

Criteria for assessment:
> Detailed assessment criteria will be issued along with the assignment.

> 1. All programs must run and compile correctly. Evidence of testing is required.
> 2. Programs must meet the problem specification
> 3. JAVA code should be readable and maintainable and follow the style recommended in the prescribed text book.
> 4. Programs should be documented
> 5. Students should be able to answer questions about their own work during an interview scheduled outside the lab class

Due date:
> Fri 15th Oct 5pm (EST)

- **Assignment task 3**

Title:
> Test 1

Description:
> This unit will have a mid-semester test in week 6. On-campus students will sit the test in the lecture, off-campus student will sit the test online via MUSO. The test will include all topics covered in lectures in weeks 1-5.

Weighting:
> 10%

Criteria for assessment:
Due date:
> Week 6

- **Assignment task 4**

Title:
VILLE Quizzes
Description:
Students will be expected to complete 10 quizzes that will help then to read and trace code. The quizzes from weeks 3-12 will be available online and will be graded automatically.   Each week a new quiz will be released and students are expected to complete the quiz prior to the lab.
Weighting:
10%
Criteria for assessment:
Assessment will be achieved automatically, via the quiz assessment tool.
Due date:
Prior to each lab starting

Examination

-

Weighting:
60%
Length:
3 hours
Type (open/closed book):
Closed book
Electronic devices allowed in the exam:
None

See Appendix for End of semester special consideration / deferred exams process.

Due dates and extensions

Please make every effort to submit work by the due dates. It is your responsibility to structure your study program around assignment deadlines, family, work and other commitments. Factors such as normal work pressures, vacations, etc. are not regarded as appropriate reasons for granting extensions. Students are advised to NOT assume that granting of an extension is a matter of course.

Students requesting an extension for any assessment during semester (eg. Assignments, tests or presentations) are required to submit a Special Consideration application form (in-semester exam/assessment task), along with original copies of supporting documentation, directly to their lecturer within two working days before the assessment submission deadline. Lecturers will provide specific outcomes directly to students via email within 2 working days. The lecturer reserves the right to refuse late applications.

A copy of the email or other written communication of an extension must be attached to the assignment submission.

Refer to the Faculty Special consideration webpage or further details and to access application forms: http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html

Late assignment

Assignments received after the due date will be subject to a penalty of 5% per day, including weekends. Assignments received later than one week (seven days) after the due date will not normally be accepted. In some cases, this period may be shorter if there is a need to release sample solutions. This policy is strict because comments or guidance will be given on assignments as they are returned, and sample solutions may also be published and distributed, after assignment marking or with the returned assignment.

If students fail to submit an assignment or assessable prac, they will be marked ABSENT (TRANSLATES TO 0), unless they have completed a Special Consideration application form (in-semester exam/assessment task) directly to their unit leader within **two working days before the assessment submission deadline**. Lecturers will provide specific outcomes directly to students via email within 2 working days. The lecturer reserves the right to refuse late applications.

Return dates

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

Feedback

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

Informal feedback on progress in labs/tutes

Graded assignments with comments

Interviews

Test results and feedback

Quiz results

Solutions to tutes, labs and assignments

Appendix

Please visit the following URL: http://www.infotech.monash.edu.au/units/appendix.html for further information about:

- Continuous improvement
- Unit evaluations
- Communication, participation and feedback
- Library access
- Monash University Studies Online (MUSO)
- Plagiarism, cheating and collusion
- Register of counselling about plagiarism
- Non-discriminatory language
- Students with disability
- End of semester special consideration / deferred exams