FIT9017
Foundations of programming

Unit Guide

Semester 2, 2013

The information contained in this unit guide is correct at time of publication. The University has the right to change any of the elements contained in this document at any time.

Last updated: 18 Jul 2013
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FIT9017 Foundations of programming - Semester 2, 2013

This unit aims to provide students with the basic concepts involved in the development of well structured software using a programming language. It concentrates on the development of problem solving skills applicable to all stages of the development process. Students gain experience with the translation of a problem specification into a program design, and the implementation of that design into a programming language. The subject introduces software engineering topics such as maintainability, readability, testing, documentation, modularisation, and reasoning about correctness of programs. Students are expected to read and understand existing code as well as develop new code.

Mode of Delivery

Caulfield (Day)

Contact Hours

2 hrs lectures/wk, 2 hrs laboratories/wk

Workload requirements

Students will be expected to spend a total of 12 hours per lecture/tutorial during semester on this unit as follows:

- two-hour lecture and
- two-hour tutorial/laboratory requiring preparation in advance
- a minimum of 2-3 hours of personal study per one hour of contact time in order to satisfy the reading and assignment expectations.

Unit Relationships

Prohibitions

CSE9000

Chief Examiner

Associate Professor Judithe Sheard

Campus Lecturer

Caulfield

Andy Cheng

Consultation hours: To be advised
Tutors

Caulfield

Andy Cheng

Consultation hours: To be advised
Academic Overview

Learning Outcomes

At the completion of this unit students will:

- be competent in designing, constructing, testing and documenting small computer programs using Java;
- be able to demonstrate the software engineering principles of maintainability, readability, and modularisation; and,
- understand the concepts of the object-oriented style of programming.
# Unit Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Activities</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No formal assessment or activities are undertaken in week 0.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Introduction to FIT9017 and expectations; introduction to programming, basic OO concepts, objects, classes, attributes, behaviour, state and identity.</td>
<td>Tutorials commence this week (Week 1)</td>
</tr>
<tr>
<td>2</td>
<td>Class definition, fields, constructors, methods, parameter passing, variables, expressions, statements, assignment, primitive data types, arithmetic operators, strings, basic output.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Selection (if and switch statements), conditions, relational &amp; logical operators, shorthand operators, ++ operator, precedence, scope and lifetime, basic input.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Object creation and interaction, abstraction, modularisation, class &amp; object diagrams, object creation, primitive vs. object types, method calling, message passing, method signatures, method overloading.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Class libraries, importing classes, collections, ArrayLists, arrays, iteration, pre and post test loops.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Testing, unit testing, testing heuristics, regression testing, debugging.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Class documentation, Javadoc, identity vs. equality, more on strings, sets and maps, conditional operator.</td>
<td>Assignment 1 due</td>
</tr>
<tr>
<td>8</td>
<td>Information hiding, encapsulation, access modifiers, scoping, class variables, class methods, constants.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Program design, design methods, responsibility-driven design, design documentation, testing a program, specifying a test strategy.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Programming errors, exception handling, file I/O.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Code quality, coupling, cohesion, refactoring, using the Java SDK.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Inheritance, superclasses, subclasses, subtypes, substitution, polymorphic variables, protected access, casting, wrapper classes, collection hierarchy.</td>
<td>Assignment 2 due</td>
</tr>
<tr>
<td>SWOT VAC</td>
<td>No formal assessment is undertaken in SWOT VAC</td>
<td></td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Value</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1; Assignment 2</td>
<td>40% total (15%; 25%)</td>
<td>Assignment 1 due Week 7; Assignment 2 due Week 12</td>
</tr>
<tr>
<td>Examination 1</td>
<td>60%</td>
<td>To be advised</td>
</tr>
</tbody>
</table>

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

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

Assessment Tasks

Participation

• Assessment task 1

  Title: Assignment 1; Assignment 2

  Description: These assignments will require students to design, write, test and document programs in Java to demonstrate their understanding and ability to apply the concepts presented at various stages of the semester.

  Weighting: 40% total (15%; 25%)

  Criteria for assessment: These are individual assignments and must be entirely your own work.

  Assessment of these assignments is by interview. You will be asked to demonstrate your system during an interview and can also expect to be asked to explain your system, your code, your design, discuss design decisions and alternatives and modify your code / system as required. Marks will not be awarded for any section of code or functionality that a student cannot explain or modify satisfactorily (the marker may delete excessive comments in code before a student is asked to explain that code).

  Further details on the tasks and requirements will be made available in the assignments' specifications. Arrangements regarding interviews will also be outlined in the assignments' specifications.

  Due date: Assignment 1 due Week 7; Assignment 2 due Week 12

Examinations

• Examination 1

  Weighting: 60%

  Length: 3 hours

  Type (open/closed book): Closed book

  Electronic devices allowed in the exam:
Learning resources

Reading list

The following may provide useful extra reading for this unit. Copies of these are available in the Caulfield Library (on reserve, one day loan or in the normal circulation).

Java Foundations, Lewis, De Pasquale & Chase, (Pearson Education), 2008

Big Java (4th Edition), Cay Horstman (John Wiley & Sons), 2010

Java Programming: From Problem Analysis to Program Design (3rd Edition), D. S Malik (Thomson), 2008


Absolute Java (3rd Edition), Savitch (Addison Wesley), 2008

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

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.monash.edu.au/exams/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

There will be no resubmission of assignments.
Referencing requirements

Students must reference material used from other sources.

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). Please note that it is your responsibility to retain copies of your assessments.

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.

Required Resources

Please check with your lecturer before purchasing any Required Resources. Limited copies of prescribed texts are available for you to borrow in the library, and prescribed software is available in student labs.

In this unit we will use Java and the BlueJ development environment. This software is available on CD with the prescribed text book and is installed in the student computer labs at Caulfield campus.

Also:

- Java software is freely available to download from the Sun website at: http://java.sun.com/javase/downloads/
- BlueJ is also freely available to download from the BlueJ site at: http://www.bluej.org/

You will be given instructions on how to use this in your first tutorial.

You are expected to work in the BlueJ development environment.

Prescribed text(s)

Limited copies of prescribed texts are available for you to borrow in the library.

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:

- Academic integrity; http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-academic-integrity-policy.html
- Special Consideration; http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.html
- 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/
- Graduate Attributes Policy http://www.policy.monash.edu/policy-bank/academic/education/management/monash-graduate-attributes-policy.html

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.html
Telephone: 03 9905 5704 to book an appointment with a DLO; or contact the Student Advisor, Student Community Services at 03 55146018 at Sunway
Email: dlu@monash.edu
Drop 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

Over the past years in which the unit has been running, students have reported an overall satisfaction with the content and presentation of the unit’s material.

If you wish to view how previous students rated this unit, please go to