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FIT9131 Programming foundations - Semester 2, 2015

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 unit 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 (Evening)
- Caulfield (Online)

Workload Requirements

Minimum total expected workload equals 12 hours per week comprising:

(a.) Contact hours for on-campus students:

- 2 hours of lectures
- One 2-hour laboratory

(b.) Study schedule for off-campus students:

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

(c.) Additional requirements (all students):

- A minimum of 8 hours independent study per week for completing lab and project work, private study and revision.

See also Unit timetable information

Unit Relationships

Prohibitions

FIT9004, FIT9017, FIT5131

Chief Examiner

Assoc Professor Judithe Sheard
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 student feedback on this unit was generally favourable.

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

Learning Outcomes

On successful completion of this unit students should be able to:

- design, construct, test and document small computer programs using Java;
- interpret and demonstrate software engineering principles of maintainability, readability, and modularisation;
- explain and apply 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>Important: Please make sure you have allocated yourself to a tutorial. All tutorials start in Week ONE. The tutorials involve important tasks which will are essential for the unit's learning. You are unlikely to pass the unit if you do not attend the tutorials. The following topics &amp; schedules may be varied slightly during the semesters, depending on student progress.</td>
<td>No formal assessment or activities are undertaken in week 0</td>
</tr>
<tr>
<td>1</td>
<td>Introduction to FIT9131 and expectations; introduction to programming, basic OO concepts, objects, classes, attributes, behaviour, state and identity.</td>
<td>Important: Tutorials commence this week (Week 1). It is extremely important that students attend all tutorials, as the majority of the learning in this unit takes place during the tutorials.</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>Class documentation, Javadoc, identity vs. equality, more on strings, sets and maps, conditional operator, Arrays.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Testing, Program Errors, Test Strategy, regression testing, debugging.</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 &amp; techniques, design methods, responsibility-driven design, design documentation.</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 during SWOT VAC</td>
<td></td>
</tr>
<tr>
<td>Examination period</td>
<td>LINK to Assessment Policy: <a href="http://policy.monash.edu.au/policy-bank/academic/education/assessment/">http://policy.monash.edu.au/policy-bank/academic/education/assessment/</a></td>
<td></td>
</tr>
</tbody>
</table>
*Unit Schedule details will be maintained and communicated to you via your learning system.

**Teaching Approach**

*Lecture and tutorials or problem classes*

This teaching and learning approach helps students to initially encounter information at lectures, discuss and explore the information during tutorials, and practice in a hands-on lab environment

**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>
Assessment Requirements

Assessment Policy

Faculty Policy - Unit Assessment Hurdles

Academic Integrity - Please see resources and tutorials at
http://www.monash.edu/library/skills/resources/tutorials/academic-integrity/

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 via individual interview (with your tutor). You will be asked to demonstrate your system during an interview and will be asked to explain your system, your code, your design, discuss design decisions/alternatives and modify your code/system as required. Marks will not be awarded for any section of code or functionality that you cannot explain or modify satisfactorily.

  These assignment assessments will address all the learning outcomes.

  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: None

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).

*Big Java: early objects* (5th Ed), Horstman (John Wiley & Sons), 2014

*Java Foundations* (3rd Ed), Lewis, De Pasquale & Chase, (Addison Wesley; Pearson Education), 2014

*Java Programming: from problem analysis to program design* (5th Ed), D. S Malik (Centage Learning), 2012

*Building Java Programs: a back to basics approach* (3rd Ed), (Pearson), 2014

*Absolute Java* (5th Edition), Savitch (Addison Wesley), 2013

Monash Library Unit Reading List (if applicable to the unit)  
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

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 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 electronic submission). 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.


Technological Requirements

Students are expected to check the unit's Moodle website regularly (at least once a day) for announcements and other online materials. Lecture notes, exercise sheets and assignment specifications will be available on Moodle to be downloaded and studied. The exercise sheets will typically contain programming tasks to be completed during the tutorial classes. The labs are equipped with all the necessary hardware/software needed for the classes; however, you may bring and use your
Assessment Requirements

own laptop/notebook if you prefer.
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

Faculty resources and policies

Important student resources including Faculty policies are located at http://intranet.monash.edu.au/infotech/resources/students/

Graduate Attributes Policy

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

Student Charter


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 Malaysia 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 Malaysia, 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 Malaysia
- 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, Malaysia Campus