



Course Outline



Paper: COMP162 – Foundations of Computer Science

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Prescription

S2, SS 0.15 EFTS OL, OC 18 points

An introduction to computer programming suitable for beginners with some prior experience. Builds on and extends basic Java and object-oriented programming. Introduces broader programming concepts and other languages.

P COMP 161 or (COMP 151 passed with a grade of at least B)

R COMP 160

SC Arts and Music, Science

Students entering from COMP151 will be provided with materials and exercises to transfer from Python to the Java programming language.

Students with other programming experience (e.g., appropriate NCEA Level 3 standards) may sit an Advanced Placement Test for direct entry to COMP 162. Enquiries about this option should be directed to adviser@cs.otago.ac.nz in advance of the start of semester.

Paper webpage - <https://www.cs.otago.ac.nz/comp162>

Intended learning outcomes

By completion of this paper students are expected to:

- Understand intermediate concepts relating to computer programming
- Demonstrate the ability to design and develop intermediate computer programs
- Develop knowledge and skills relating to problem solving, program design, object-oriented programming, data structures and algorithms

Workload expectations

This is an 18-point paper which represents 180 hours of work (as per [Otago guidelines](#)). There are 26 scheduled lecture hours and 50 scheduled lab hours, leaving 104 hours for your own study.

Assessment requirements and submission dates

This paper consists of 40% internal assessment, and a 60% final exam.

For internal assessment, you will sit a sequence of “mastery” tests. Each test is graded pass/fail (pass = full marks, fail = zero marks). Each test contributes a certain percentage towards for your final mark (as specified in the table on the next page). For example, if you pass Mastery Test 1 you get 4%.

Mastery tests can be attempted more than once, and in any order. In general, there will be two opportunities every week to attempt a test. To sit a Mastery Test, you must first complete the Mastery Test prep material and be signed off by a lab staff member. You can complete mastery tests at your own pace. However, you must complete Mastery Tests 1 & 2 by August 15th. After this time, you will no longer be able to sit Mastery Tests 1 and 2.

Table 1 – Lab assessment in COMP162

Assessment	Coverage	Weight	Suggested completion date
MT Prep 1	Java basics	1%	
Mastery Test 1		4%	26 July*
MT Prep 2	OO and Hierarchies	1%	
Mastery Test 2		4%	4 August*
MT Prep 3	Algorithms	1%	
Mastery Test 3		4%	9 August
MT Prep 4	Algorithms 2	1%	
Mastery Test 4		4%	16 August
MT Prep 5	Linked lists	1%	
Mastery Test 5		4%	8 September
MT Prep 6	Collections & DS	1%	
Mastery Test 6		4%	20 September
MT Prep 7	Recursions	1%	
Mastery Test 7		4%	22 September
MT Prep 8	C Basics	1%	
Mastery Test 8		4%	6 October
<i>Final exams</i>			

* Deadline: August 15th

Mastery tests and the practical tests are all held in the COMP162 laboratory under supervision, and must be completed individually. The best preparation for these tests is to work through the exercises in the *COMP162 Lab Book*, available on Blackboard.

Lectures and laboratories

There are two scheduled lectures per week, these are held on Wednesday and Friday from 9am to 10am, in the lecture theatre specified in your eVision timetable. Lectures audio and slides are all recorded and hosted in Echo360. Links to these recordings are available on Blackboard a short time after the lecture finishes (depending on server load). However, materials written on the whiteboard or in-class activities will not be recorded. Students may also make their own recordings if they want to, by arrangement with the lecturer. All lecture notes are available on Blackboard. The Schedule of topics is included at the end of this document.

You will be timetabled into two lab sessions per week, one in the first half of the week (to noon on Tuesday) and one in the second half (from noon on Wednesday). Labs are held in a laboratory in the Computer Science Department (Owheo Building), as specified in your eVision timetable. Please attend your timetabled weekly sessions. Lab exercises are specified in the COMP162 Lab Book, which is available on Blackboard.

Attendance requirements

There are no formal attendance or terms requirements, but you should aim to progress through lab exercises and mastery tests at roughly the same rate that the lecture topics are progressing (see the Schedule at the end of this document).

As noted in the section on assessment above, while Mastery Tests can be completed in any order, and generally at your own pace, there is one deadline after MT2. Once the deadline has passed, you will no longer be able to sit MTs 1 and 2. While MTs can be completed at your own pace, and in any order, we recommend that you aim to make steady progress on the mastery tests in a sequential fashion, so that you achieved your desired mark for the course. It is your responsibility to plan and monitor your own progress.

Reading requirements and learning materials

The main learning materials for the course are the COMP162 Lecture Notes and the COMP162 Lab Book (as described in the section Lectures and laboratories above). Both are available on Blackboard (under the section Course Documents). Each lecture will have recommended readings, often drawn from two free online textbooks, as described in the lecture notes. There is no required hardcopy textbook.

Computing resources and other technologies

This course uses the jGRASP integrated development environment (IDE) to write programs in the Java programming language. jGRASP is available on the machines in your timetabled laboratories, and may also be available on the Otago Student Desktop (Start Menu / Course Specific Resources / Computer Science). It is free to install on your own machine (Mac, Windows or Linux). (The recommended version of jGRASP includes an installation of Java). Comparative languages including C, R, and Python, will be taught with several different text editors and IDEs. Information on these will be found in the COMP162 Lab Book.

This course uses Blackboard to distribute resources (including the lecture notes and lab book) and for course announcements. Please check Blackboard for announcements regularly, and monitor your email (make sure that your student email forwards to your preferred email account if necessary). This course also uses Moodle (a learning management platform similar to Blackboard) to administer mastery tests in our labs.

Support available

For general learning (beyond course materials and staff listed above) see the resources at [Student Learning Development](#). Various organisations can provide support for [Māori](#) and [Pacific](#) students. Students with disabilities or impairments should contact the [Otago Disabilities Information and Support Office](#). The Computer Science Department also provides support in [many cases](#). Please contact the course coordinator if you have any special requirements.

Academic integrity and acceptable academic practice

The standard Otago policies apply, see for example [here](#), [here](#), [here](#).

Class representatives

Otago has a system of [class representatives](#). When appointed for COMP162, they will be listed on Blackboard.

Lecture schedule

Lectures are held twice a week for the 13 teaching weeks of the semester. Lecture topics and dates are listed in Table 2.

Table 2 – Lecture and Lab schedule for COMP162

Lecture Date	Lecture Title	Lab	Lab Title	MT
July 12	Introduction/Ethics	1	Recap COMP161 (Bicycles/ Animals)	(MT1)
July 14	Matariki	2	Recap: COMP161 (Coin Tosses and Points)	(MT1)
July 19	Introduction to Algorithms	3	Recap: COMP161 (Ant Study)	(MT1)
July 21	Inheritance 1	4	Recap: COMP161 (Ant Study continued)	(MT1)
July 26	Inheritance 2	5	Recap More Arrays	(MT1)
July 28	Interfaces	6	Hierarchies and Abstract Classes 1	(MT2)
August 2	Algorithms	7	Hierarchies and Abstract Classes 2	(MT2)
August 4	Analysis of Algorithms 1	8	Interfaces	(MT2)
August 9	Analysis of Algorithms 2	9	Algorithms & Problem Solving 1	(MT3)
August 11	Arrays	10	Algorithms & Problem Solving 2	(MT4)
August 16	Lists	11	Algorithms & Problem Solving 3	(MT4)
August 18	Linked Lists	12	Arrays - Young Tableaux	-
August 23	Generics and Collections	13	Singly Linked Lists	(MT5)
August 25	Stacks	14	Doubly Linked Lists	(MT5)
August 30	Mid-semester Break			-
September 1	Mid-semester Break			-
September 6	Queues	15	Doubly Linked List - Bus Route	(MT5)
September 8	Recursion	16	Linked Lists & Problem Solving	(MT5)
September 13	Insertion and Selection Sort	17	Linked Lists - Young Tableaux	(MT5)
September 15	Quicksort	18	Stacks	(MT6)
September 20	Mergesort	19	Queues	(MT6)
September 22	Object Oriented Programming 1	20	Recursion	(MT7)
September 27	Object Oriented Programming 2	21	Catch-up	-
September 29	C Programming 1	22	Bucket sort	-
October 4	C Programming 2	23	C Programming 1	(MT8)
October 6	Functional Programming 1	24	C Programming 2	(MT8)
October 11	Functional Programming 2	25	Catch-up	-
October 13	Review	26	Catch-up	-

Disclaimer

Every effort is made to ensure that the information contained in this document is accurate, but it is subject to change / correction. Changes will be notified via Blackboard. You are encouraged to check Blackboard regularly. It is your responsibility to be informed.