

Algorithms and Data Structures - Course Outline

COMP 261: 2016 Trimester 1

This document sets out the workload and assessment requirements for COMP 261. It also provides contact information for staff involved in the course. If the contents of this document are altered during the course, you will be advised of the change by an announcement in lectures and/or on the course web site. A printed copy of this document is held in the School Office.

Objectives

This course covers a range of algorithms and data structures building on the fundamental structures and algorithms from COMP 103. The major areas covered are: graph algorithms, graphics algorithms and advanced data structures. This course takes a practical approach focusing on the implementation of a wide variety of algorithms.

The goal of COMP 261 is to introduce you to a wide range of algorithms and data structures.

By the end of the course, students should be able to:

1. select, adapt, and implement a wide range of standard algorithms and data structures to construct software solutions to complex problems (BE [3\(a\)](#), [3\(d\)](#), [3\(f\)](#), BSc [1](#), [2](#));
2. understand algorithms described in pseudocode and to use analysis of an algorithm's time and space requirements to determine applicability to a problem (BE [3\(a\)](#), [3\(b\)](#), BSc [3](#));
3. recognise the distinction between "easy" problems, 'hard' (NP) problems, and uncomputable problems and the consequences for constructing algorithms and programs for such problems (BE [3\(b\)](#), BSc [3](#), [4](#));
4. know and be able to implement important algorithms related to graphs, searching, parsing, basic graphics rendering, and B-Trees (BE [3\(a\)](#), BSc [2](#)).

Your understanding will be assessed by assignments, an in-lecture term test, and a final examination. Tutorial exercises and readings (not directly assessed) will reinforce lecture material.

Textbook

There is no text book for COMP 261, but if you can find old copies of this book they can come in helpful (the library may also have a copy):

"Algorithms and Data Structures", Compiled By: Alex Potanin, Addison-Wesley, 2011, RRP: \$119.99.

Lectures, Tutorials, Laboratories, and Practical work

A [schedule](#) of lecture topics, readings, and assignment due dates is available online.

Major topics will include graph algorithms, searching, B-Trees, basic graphics rendering, and parsing.

Lectures for COMP 261 are:

- Mondays at 11am - 11:50am in COLT122,
- Tuesdays at 11am - 11:50am in HULT323,
- Thursdays at 11am - 11:50am in HULT323.

Tutorials, which all students are expected to attend one of, will be held on:

- Mondays at 2:10pm - 3pm in AM106,
- Mondays at 3:10pm - 4pm in EA201,
- Tuesdays at 3:10pm - 4pm in EA201,
- Wednesdays at 9am - 9:50am in AM104,
- Wednesdays at 3:10pm - 4pm in CO119,
- Thursdays at 1:10pm - 2pm in FT83/203,
- Thursdays at 2:10pm - 3pm in AM106,
- Fridays at 2:10pm - 3pm in KK107.

You will need to sign up to one of the tutorial slots and attend **that** tutorial throughout the trimester. You should sign up for a tutorial slot using [Student Allocator](#) **before Friday 4th of March, 10:30am**.

Tutorials start on Monday, 7th of March (second week of lectures).

Help Desk will be held in CO242b on the following days and times and will start in the second week of the trimester:

- Mondays at 10am - 10:50am,
- Tuesdays at 10am - 10:50am,
- Wednesdays at 10am - 10:50am,
- Thursdays at 10am - 10:50am,
- Fridays at 10am - 10:50am.

Assignments and Projects

There will be 5 assignments for the course, all of which will include constructing programs that use particular algorithms. Each assignment will be approximately 2 weeks. The assignments will have to be submitted electronically using the ECS Submission System. For each assignment, you must submit an executable jar file, all your source code, and (if required) a report. All of the assignments will address objectives 1 and 2 above. Some assignments will address objectives 3 and 4 above.

Workload

In order to maintain satisfactory progress in COMP 261, you should plan to spend an average of at least 10 hours per week on this paper. A plausible and approximate breakdown for these hours would be:

- Lectures and tutorials: 4 hours,
- Review and readings: 1 hour,
- Assignments: 5 hours.

Note: A 15 point course maps to 150 hours spread over the 12 weeks of lectures, the mid-trimester break, study week, and the exams period. We assume that you will be able to spend at least 10 hours on the course during the mid-trimester break.

As 200-level students, you are expected to acquire the ability to apply your knowledge and skills to the analysis and design of basic problems; you will develop the skills to explain your analysis and design to your peers and to staff. Please refer to ECS Expectations of Students for more information.

School of Engineering and Computer Science

The School office is located on level three of the Cotton Building (Cotton 358).

Staff

The course organiser and lecturer for the first three weeks and for the last six weeks for COMP 261 is Alex Potanin:

- Alex Potanin
- Cotton 262
- +64 4 463 5302
- alex@ecs.vuw.ac.nz (See tutors' email below for technical questions.)

COMP 261 OFFICE HOURS FOR ALEX: *Mondays 12:30pm - 2:30pm* Monday 29 February - Monday 14 March and Monday 4 April - Monday 13 June except public holidays such as ANZAC Day and Queens Birthday.

The lecturer for the weeks 4, 5, and 6 is Zohar Levi:

- Zohar Levi
- Cotton 338
- +64 4 463 5233 x 7045
- zohar.levi@ecs.vuw.ac.nz (See tutors' email below for technical questions.)

COMP 261 OFFICE HOURS FOR ZOHAR: *Mondays 12:00pm - 1:00pm during my lecture weeks. Please send an email beforehand.*

The tutors are Kelsey Jack, Harry Ross, Gareth Tucker, Paul Mathews, Tony Butler-Yeoman, Daniel Little, Vahid Arabnejad.

The class representatives are Stefan Vrecic, Elroy Dalefield, Frank Thrift, James Wrigley, they also have mobiles but for privacy reasons you should email them to ask for one.

The Head of Engineering and Computer Science is Stuart Marshall .

Announcements and Communication

The main means of communication outside of lectures will be the COMP 261 web area at http://ecs.victoria.ac.nz/Courses/COMP261_2016T1/. There you will find, among other things, this document, the lecture schedule and assignment handouts, and the COMP 261 Forum. The forum is a web-based bulletin board system.

Questions and comments can be posted to the forum, and staff will read these posts and frequently respond to them.

Assessment

Your grade for COMP 261 will be determined based on the following assessment weightings:

<u>Item</u>	<u>Weight</u>
Assignment 1	6%
Assignment 2	6%
Assignment 3	6%
Assignment 4	6%
Assignment 5	6%
Terms Test	20%
Final Examination	50%

Typically, each assignment will cover material presented in the preceding few weeks of the course. Each assessment item will address all or most of the course objectives.

Tests and Exams

There is one terms test, held during the normal lecture slot at 11am on Monday 18th of April, 2016 in several rooms: the normal lecture theatre room (COLT122) and additional spill over room: HMLT002. The exact details of the split of the class will be announced closer to the time.

You have to get in touch with the course coordinator ([Alex Potanin](#)) as soon as possible if you discover that you cannot attend the terms test so that alternative arrangements can be made if applicable.

The [timetable for final examinations](#) will be available from the University web site and will be posted on a notice board outside the faculty office. The final examination will be two hours long. No computers, electronic calculators or similar device will be allowed in the final examination. Paper non-English to English dictionaries will be permitted. The examination period for trimester 1 is 10 June - 29 June.

Practical Work

<u>Item</u>	<u>Due Date</u>
Assignment 1	Monday 21 March 2016 at 10:30am
Assignment 2	Monday 11 April 2016 at 10:30am
Assignment 3	Monday 2 May 2016 at 10:30am
Assignment 4	Monday 16 May 2016 at 10:30am
Assignment 5	Monday 30 May 2016 at 10:30am

The assignments will be marked in person: you will need to sign up for a 15 minute session with one of the markers for you to demonstrate your program and to talk about key details of your program with the marker. The marking slots will be announced closer to the time and will be posted outside the lab where the marking will take place. The marking weeks are typically the week the assignment is due and the one after: weeks 4,5 for A1, weeks 6,7 for A2, weeks 8,9 for A3, weeks 10,11 for A4, weeks 12 and study week for A5.

The in person marking is going to be done in CO235. The sign up sheets will be posted outside of CO235.

If you do not get your assignment marked in the marking slots assigned for that assignment, you will automatically get 10% penalty and if the assignment is not marked by the end of the course, you will get 0% for that assignment. If you have any special circumstances you need to contact the course coordinator a.s.a.p. to see if alternative arrangements can be made if appropriate.

The policy on late submission is as follows:

- Each assignment will be marked out of 100.
- Each assignment that is late (ie, submitted on the submission system after the deadline) will be penalised by 20 marks if it is up to 24 hours late, and penalised by 40 marks if it is between 24 hours and 48 hours late. Any work submitted more than 48 hours after the deadline **will receive 0 marks**.
- Each student will have 3 "late days" which you may choose to use for any assignment or assignments during the course. There will be no penalty applied for these late days. You do not need to apply for these - any late days you have left will be automatically applied to assignments that you submit late.
- The late days are intended to cover minor illnesses or other personal reasons for being late. You should only ask for

extensions in the case of more significant or longer lasting problems (and you may need documentation). Do not waste "late days" on procrastination!

Plagiarism

Working Together and Plagiarism

We encourage you to discuss the principles of the course and assignments with other students, to help and seek help with programming details, problems involving the lab machines. However, any work you hand in must be your own work.

The [School policy on Plagiarism](#) (claiming other people's work as your own) is available from the course home page. Please read it. We will penalise anyone we find plagiarising, whether from students currently doing the course, or from other sources. Students who knowingly allow other students to copy their work may also be penalised. If you have had help from someone else (other than a tutor), it is always safe to state the help that you got. For example, if you had help from someone else in writing a component of your code, it is not plagiarism as long as you state (eg, as a comment in the code) who helped you in writing the method.

Mandatory Course Requirements

1. Achieve at least 40% in the exam.

Any student who is concerned that they have been (or might be) unable to meet any of the MCRs because of exceptional personal circumstances, should contact the course coordinator as soon as possible.

Passing COMP 261

To pass COMP 261, a student must satisfy mandatory requirements and gain at least a **C-** grade overall.

Withdrawal

The last date for withdrawal from COMP 261 with entitlement to a refund of tuition fees is Friday 11 March 2016. The last date for withdrawal without being regarded as having failed the course is Friday 13 May 2016 -- though later withdrawals may be approved by the Dean in special circumstances.

Rules & Policies

Find key dates, explanations of grades and other useful information at <http://www.victoria.ac.nz/home/study>.

Find out about academic progress and restricted enrolment at <http://www.victoria.ac.nz/home/study/academic-progress>.

The University's statutes and policies are available at <http://www.victoria.ac.nz/home/about/policy>, except qualification statutes, which are available via the Calendar webpage at <http://www.victoria.ac.nz/home/study/calendar> (See Section C).

Further information about the University's academic processes can be found on the website of the Assistant Vice-Chancellor (Academic) at <http://www.victoria.ac.nz/home/about/avcacademic>

All students are expected to be familiar with the following regulations and policies, which are available from the school web site:

[Grievances](#)

[Student and Staff Conduct](#)

[Meeting the Needs of Students with Disabilities](#)

[Student Support](#)

[Academic Integrity and Plagiarism](#)

[Dates and Deadlines including Withdrawal dates](#)

[School Laboratory Hours and Rules](#)

[Printing Allocations](#)

[Expectations of Students in ECS courses](#)

The School of Engineering and Computer Science strives to anticipate all problems associated with its courses, laboratories and equipment. We hope you will find that your courses meet your expectations of a quality learning experience.

If you think we have overlooked something or would like to make a suggestion feel free to talk to your course organiser or lecturer.

[Course Outline as PDF](#)