

# COMPSCI 105: Principles of Computer Science

**2017 Semester 1**

**15 Points**

## Prerequisites and restrictions

### Prerequisites:

COMPSCI 101

### Restriction:

COMPSCI 107

## Course Description

The 105 course must be taken by students who have completed 101 and wish to advance in Computer Science. It extends the programming skills of the Principles of Programming course, focusing on data structures and efficient ways to manipulate data. The course is taught using the Python programming language. Topics include: recursion, regular expressions, data interchange, abstract data types, linear data structures (lists, stacks, queues), non-linear data structures (heaps, hash tables, trees), searching and sorting.

## Staff involved in the course

### Course Coordinator

- Angela Chang, room 303-414, [angela@cs.auckland.ac.nz](mailto:angela@cs.auckland.ac.nz)

### Lecturers

- Dr Bruce Sham, room 303S-588, [b.sham@auckland.ac.nz](mailto:b.sham@auckland.ac.nz)
- Dr Burkhard Wuensche, room 303-529, [burkhard@cs.auckland.ac.nz](mailto:burkhard@cs.auckland.ac.nz)

### Tutors

- Teerera Marange, [t.marange@auckland.ac.nz](mailto:t.marange@auckland.ac.nz)
- Lindsay Shaw, [lsha074@aucklanduni.ac.nz](mailto:lsha074@aucklanduni.ac.nz)

## Timetable

### Lectures

- Wednesday 1:00PM - 2:00PM, 303-G20 (PLT1)
- Thursday 1:00PM - 2:00PM, Eng1401
- Friday 1:00PM - 2:00PM, 109-B15

### Laboratories

- One laboratory each week as selected. All laboratories are held in 303S-B75. Laboratories begin in the 2<sup>nd</sup> week of semester (i.e. first lab will be 16<sup>th</sup> March).

## Tutorials

- There are no tutorials in this course

## Course Outcomes

A student who successfully completes this course should be able to:

- Define a class to model and represent an object
- Write code which handles important exception types
- Use a standard data interchange format for reading and writing complex data types
- Write programs that store and manipulate data in standard linear data structures (arrays, linked lists, stacks, queues) and non-linear data structures (hash tables, trees)
- Compare the efficiency of algorithms using standard big-O notation
- Implement recursive solutions to simple problems
- Implement recursive data structures such as linked lists and trees
- Explain the basic algorithm for any of the studied sorting methods
- use regular expressions to extract data from a body of text

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## Lecture Schedule

Timing of the lectures, labs, assignments and test are shown below:

Wednesday	Thursday	Friday		
8 Mar <b>Lect 1</b>	9 Mar <b>Lect 2</b>	10 Mar <b>Lect 3</b>		
15 Mar <b>Lect 4</b>	16 Mar <b>Lect 5</b>	17 Mar <b>Lect 6</b>	Labo1	
22 Mar <b>Lect 7</b>	23 Mar <b>Lect 8</b>	24 Mar <b>Lect 9</b>	Labo2	
29 Mar <b>Lect 10</b>	30 Mar <b>Lect 11</b>	31 Mar <b>Lect 12</b>	Labo3	
5 Apr <b>Lect 13</b>	6 Apr <b>Lect 14</b>	7 Apr <b>Lect 15</b>	Labo4	Term Test (15%)
12 Apr <b>Lect 16</b>	13 Apr <b>Lect 17</b>	14 Apr <b>Mid-semester break</b>		A1 (5%)
19 Apr <b>Mid-semester break</b>	20 Apr <b>Mid-semester break</b>	21 Apr <b>Mid-semester break</b>		
26 Apr <b>Mid-semester break</b>	27 Apr <b>Mid-semester break</b>	28 Apr <b>Mid-semester break</b>		
3 May <b>Lect 18</b>	4 May <b>Lect 19</b>	5 May <b>Lect 20</b>	Labo5	
10 May <b>Lect 21</b>	11 May <b>Lect 22</b>	12 May <b>Lect 23</b>	Labo6	A2(5%)
17 May <b>Lect 24</b>	18 May <b>Lect 25</b>	19 May <b>Lect 26</b>	Labo7	
24 May <b>Lect 27</b>	25 May <b>Lect 28</b>	26 May <b>Lect 29</b>	Labo8	
31 May <b>Lect 30</b>	1 Jun <b>Lect 31</b>	2 Jun <b>Lect 32</b>	Labo9	
7 Jun <b>Lect 33</b>	8 Jun <b>Lect 34</b>	9 Jun <b>Lect 35</b>	Labo10	A3(5%)

# Assessment

## Requirements for passing

This course is a practical course. That means you have to pass the practical component (labs and assignments) as well as the written (test and exam) components.

- Labs (worth 10%)
- Assignments (worth 15%)
- Test worth 15%
- Final exam worth 60%

Notes:

- To pass the practical component, you will need to have at least 12.5 out of 25.
- To pass the written component, you will need to have at least 37.5% out of the combined test and exam total of 75%.
- You also need an overall mark of at least 50% out the full course total of 100%.

## Labs

The laboratories are worth 10% of your final mark. The labs start in the second week of the semester. Attendance at the labs is compulsory. Every laboratory session contributes towards your final grade. The labs are designed to give you practical experience with the concepts which you have learnt in lectures. They will include some activities to be completed during the laboratory session. Each week you should make sure you have read through the lecture slides and have done any other preparation required before you attend the laboratory.

The laboratories are submitted using the CodeRunner website. Submissions are graded by running a series of test cases of the code in a sandbox and comparing the output of your program with the expected output. This automated testing allows you to obtain immediate feedback on your progress throughout the course. Some submissions will also be graded manually to provide further feedback. You will be able to access your exercises by logging into:

<https://www.coderunner.auckland.ac.nz/moodle/>

## Assignments

There are three assignments (worth a total of 15%) for which you are required to write one or more programs. All assignments are to be submitted to the assignment dropbox:

<https://adb.auckland.ac.nz/Home/>

## Test

The Test is worth 15% of your final mark, and will be held between 6:15 pm - 7:15 pm on Monday 3rd April. Please ensure you are available to sit the Test - if you are enrolled in another course that has a test scheduled for the same time (or if you are unable to attend this test time for another valid reason), then please contact the course coordinator, Angela Chang, as soon as possible.

## Exam

The final exam is worth 60% of your final mark. Please check Student Services Online for the exam time and date. The exam is closed book, and calculators are not permitted. Provisional exam results can be obtained from Student Services Online.

## Checking your marks on Canvas

You can check your marks by logging onto Canvas

<https://canvas.auckland.ac.nz>

If there are any problems with your Lab, Assignment or Test marks, please contact Angela Chang.

## **Assistance**

There are a number of places where you can seek assistance with your learning. If you have an administrative problem (e.g. you have been ill, you have a timetable clash with your lab or test, your marks have been incorrectly recorded, etc.), or any other sort of problem that you need help with, please see the course coordinator.

Students are asked to discuss privately any impairment related requirements face-to-face and/or in written form with the course coordinator. If you need extra help with understanding the course material, or preparing for the test or exam, you are very welcome to visit the teaching staff team or any lab tutor at a time when they are available.

There are many other resources available within the University, e.g. the Student Learning Centre, the library, DELNA (to identify where you may need help with your academic English) and ELE (English Language Enrichment - a set of resources to help you improve your English).

## **Office Hours**

All staff have office hours when they are available to students. You are encouraged to come and discuss any matters arising from the course during those hours. Staff are also frequently available at other times.

## **Lecture Recordings**

All lectures are recorded. They may be a delay of 1-2 days before the lecture recordings are distributed through Canvas. You can find the lecture recordings on the Lecture Recordings page (COMPSCI 105 > Pages > Lecture Recordings). Note that although the lectures are recorded, some learning activities conducted in class do not translate well to the recordings. To maximise your learning opportunities, you are encouraged to attend the class in person.

## **Discussion Forums**

The discussion forums are regularly monitored by teaching staff. Please make use of the forums to ask any questions that you think might be of interest to other students. If your question is of a personal nature, or relates to a unique situation that will be of little interest to others, then please contact the teaching staff directly. You will be able to access the forum by logging into:

<https://forums.cs.auckland.ac.nz/>

## **Textbook**

The textbook is Problem Solving with Data Structures and Algorithms by Brad Miller and David Ranum, Luther College. The book is available for free as a PDF under Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. An online version with interactive exercises is available at:

<https://interactivepython.org/runestone/static/pythonds/index.html>

Note that the textbook is provided as supplemental material to enhance and extend your understanding. You are encouraged to read the relevant chapters in parallel to the in-class activities.

## **Class Website**

Although we will be using Canvas during semester 1 for announcements and recordings, the COMPSCI 105 website contains some basic information (lecture notes and assessment resources) about the course:

<https://www.cs.auckland.ac.nz/courses/compsci105s1c/>

## Tutorials

Although there are no tutorials, the laboratory tutor is happy to answer any questions during the laboratory sessions.

## Help with Canvas

For help with Canvas see:

<https://www.auckland.ac.nz/en/about/learning-and-teaching/CanvasHomepage/canvas-help---support.html>.

## Handling illness or absence

If you must leave for family emergencies etc., PLEASE talk to the lecturer, or somehow get a message to the department. Very few problems are so urgent that we cannot be told quite quickly.

For problems affecting assignments or tests, see the lecturer, as soon as reasonably possible.

For illness during exams (or other problems that affect exam performance) students MUST contact the University within **one week** of the last affected examination, to apply for an aegrotat pass (for illness) or compassionate pass (other problems). **The one week limit is strictly enforced.**

Refer to the University information about Aegrotat and Compassionate Considerations:

<https://www.auckland.ac.nz/en/for/current-students/cs-academic-information/cs-examination-information/cs-aegrotat-and-compassionate-consideration.html>

## Academic Integrity

The University of Auckland will not tolerate cheating, or assisting others to cheat, and views cheating in coursework as a serious academic offence. The work that a student submits for grading must be the student's own work, reflecting his or her learning. Where work from other sources is used, it must be properly acknowledged and referenced. This requirement also applies to sources on the world-wide web. A student's assessed work may be reviewed against electronic source material using computerised detection mechanisms. Upon reasonable request, students may be required to provide an electronic version of their work for computerised review.

Please refer to <http://www.auckland.ac.nz/uoa/home/about/teaching-learning/honesty>.