

Principles of Programming S2, 2020

Course Information

COMPSCI 101 – PRINCIPLES OF PROGRAMMING

This course is an introduction to programming computers. It is the main introductory course in the School of Computer Science and is taken by students from a variety of disciplines wishing to have an understanding of computer programming as well as students wanting to continue on to further studies in Computer Science.

We teach programming using the cross-platform language Python. The main focus is on learning to understand the detailed requirements of a programming task, and writing programs that are well structured, correct, easy to read, and to maintain. In order to do this, students need to develop the skills of incrementally developing and testing programs.

The course covers simple variables, expressions, input and output, control structures, functions, using standard data structures such as lists and dictionaries, and using standard Python modules.

By the end of the course, students who succeed should be able to design and implement a medium-size computer program as well as have some idea of the process of program execution.

LEARNING OUTCOMES

A student who successfully completes this course will be able to: understand code, implement algorithms, test code, document code, design solutions using functional decomposition and implement those solutions. More specifically, a student who successfully completes this course will be able to:

- determine the state of the program both during and after execution, given a code listing that may include functions and parameters, loops, conditionals and sequences
- implement a given algorithm using Python
- show that a program meets given specifications by writing appropriate tests
- provide a useful level of documentation, in the form of program comments, for all programs developed
- decompose a simple problem into several smaller tasks, given a brief textual description of the problem
- add functions that perform a specified task into a program that solves a given problem.

TEACHING STAFF

Below is the contact information of the five people involved with the teaching of COMPSCI 101 in Semester 2, 2020. We all have an “Open Door” policy and are more than happy to help you with any queries that you may have.

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PROPOSED LECTURE / LAB SCHEDULE
(First Half of Semester)

COMPSCI 101, Semester 2, 2020				
Day	Date	Lec	Lecture Schedule	Labs
Saturday/Sunday				
Monday	27-Jul	1	Introduction	No Lab Find the lab room (3035-279)
Tuesday	28-Jul			
Wednesday	29-Jul			
Thursday	30-Jul	2	Variables, program execution, doing calculations, print()	
Friday	31-Jul	3	Expressions, mathematical operators, the math module, round()	
Saturday/Sunday				
Monday	03-Aug	4	Strings, objects, the len() function, string slices	Lab 1 Variables Calculations Expressions math module
Tuesday	04-Aug			
Wednesday	05-Aug			
Thursday	06-Aug	5	Manipulating strings, String methods, dot notation	
Friday	07-Aug	6	Getting user input, converting between types, random numbers	
Saturday/Sunday				
Monday	10-Aug	7	Defining functions	Lab 2 Strings, string slices Random numbers User input int(), float(), str()
Tuesday	11-Aug			
Wednesday	12-Aug			
Thursday	13-Aug	8	Calling functions from other functions, scope of variables	
Friday	14-Aug	9	Code tracing, divide a program into separate tasks	
Saturday/Sunday				
Monday	17-Aug	10	Boolean expressions, if statements, equality and floats	Lab 3 Defining functions A1 due (strings, math)
Tuesday	18-Aug			
Wednesday	19-Aug			
Thursday	20-Aug	11	if ... else, if ... elif statements, nested ifs	
Friday	21-Aug	12	while loops	
Saturday/Sunday				
Monday	24-Aug	13	The Python range() function, for ... in loops	Lab 4 if statements while loops
Tuesday	25-Aug			
Wednesday	26-Aug			
Thursday	27-Aug	14	Lists, using for ... in loops to iterate through the elements of a list	
Friday	28-Aug	15	Revision (Test is on all the material up to the end of Lecture 12)	
Saturday/Sunday				
Monday	31-Aug			<div style="background-color: #90EE90; padding: 5px; text-align: center;">Test 1 (Tuesday 1st September)</div> (Lectures 1 - 12 and Labs 1 - 4) NO LECTURES OR LABS THIS WEEK A2 due (Functions, loops)
Tuesday	01-Sep			
Wednesday	02-Sep			
Thursday	03-Sep			
Friday	04-Sep			
Mid-Semester break				

PROPOSED LECTURE / LAB SCHEDULE
(Second Half of Semester)

Mid-Semester break							
Monday	21-Sep	16	The split() function, updating the elements of a list, lists are mutable	Lab 5	for loops range() function lists		
Tuesday	22-Sep						
Wednesday	23-Sep						
Thursday	24-Sep	17	Slicing lists, list methods				
Friday	25-Sep	18	Lists revision				
Saturday/Sunday							
Monday	28-Sep	19	Tuples	Lab 6	List methods List slices		
Tuesday	29-Sep						
Wednesday	30-Sep						
Thursday	01-Oct	29	Open, read, write and close files				
Friday	02-Oct	21	Maintaining a text file of information				
Saturday/Sunday							
Monday	05-Oct	22	Dictionaries	Lab 7	File processing Tuples		
Tuesday	06-Oct						
Wednesday	07-Oct						
Thursday	08-Oct	23	More on dictionaries				
Friday	09-Oct	24	Python sequences, using the Python interpreter				A3 due (Lists)
Saturday/Sunday							
Monday	12-Oct	25	tkinter 1 - GUI's, using the Canvas widget	Lab 8	Dictionaries		
Tuesday	13-Oct						
Wednesday	14-Oct						
Thursday	15-Oct	26	tkinter 2 - Drawing shapes using nested loops				
Friday	16-Oct	27	More on nested loops, passing mutable objects as parameters				
Saturday/Sunday							
Monday	19-Oct	28	Testing, docstrings for functions, doctests	Lab 9	Nested for loops Tkinter - drawing shapes		
Tuesday	20-Oct						
Wednesday	21-Oct	29	Revision for test and exam				
Thursday	22-Oct						
Friday	23-Oct						A4 due (dictionaries)
Saturday/Sunday							
Monday	26-Oct						
Tuesday	27-Oct		Test 2 (Tuesday 27th October)				
Wednesday	28-Oct		NO LECTURES OR LABS THIS WEEK				
Thursday	29-Oct						
Friday	30-Oct					A5 due (tkinter)	

ASSESSMENTS

Pass Requirements

Your final grade will consist of 2 invigilated computer-based tests worth 45% in total, a final (written) exam worth 25%, 9 labs worth 9% in total, 9 timed CodeRunner3 questions worth 6% in total (each is worth 1% but only the best 6 are counted towards your final grade) and 5 assignments worth 15% in total. To pass the course, as well as obtaining at least 50% overall, you must obtain at least 50% of the total mark for the invigilated computer-based tests and at least 50% of the total mark for the final written exam.

Laboratories

Labs are worth 9% of your final mark. Labs start in the second week of semester and are held in Room 303S-279. Every laboratory session contributes towards your final grade and are submitted on CodeRunner3.

The labs are designed to give you practical experience with the basic concepts which you have learnt in lectures. Tutors will be available in the lab to assist you and will also give you advice on good coding style. CodeRunner3 will be used to check your answers for correctness. Please remember to submit your lab answers to CodeRunner3 no later than 4:30pm (NZ time) on Thursday each week.

Each week you should make sure you have read through the lecture slides and have done any other preparation required before attending the lab.

Assignments

Assignments are designed to give you practical experience with the concepts that you have learnt in lectures and labs. Assignments are worth a total of 15% of your final mark. There are five assignments worth 3% each. Here are the tentative due dates (but may be subject to change). Note that all due date/times are expressed in New Zealand time.

Assignment 1: due 4:30pm on Friday, 21st August
Assignment 2: due 4:30pm on Friday 4th September
Assignment 3: due 4:30pm on Friday 9th October
Assignment 4: due 4:30pm on Friday 23rd October
Assignment 5: due 4:30pm on Friday 30th October

For assignments where you are writing complete programs, you will submit your programs to the assignment dropbox:

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

For other assignments you will use the CodeRunner3 tool to submit your assignment. Submissions are marked by CodeRunner3 running a series of test cases of the code in a sandbox and comparing the output with the expected output.

Timed CodeRunner3 Questions

After the last lab session for the week (i.e. at 3pm NZ Time on Wednesdays), there will be a timed CodeRunner3 exercise (or set of exercises) for you to do. These exercises will be closely aligned

to the lab you have just completed. The exercises will be timed - which means that you will have to develop and implement your solution within a certain amount of time. The main purpose of these timed exercises is to give you practice for the 2 invigilated computer-based tests. Each of these exercises (or sets of exercises) will be worth 1 mark but only your best 6 will be counted towards your final grade. Submissions are graded by running a series of test cases on your code in a sandbox and comparing the output of your code with the expected output. Timed exercises are due at 4:30pm (NZ time) on the Saturday of the same week that the lab is due.

Invigilated Computer-based Tests

There will be 2 compulsory invigilated computer-based tests for this course. The first test contributes 20% towards your final grade and the second test contributes 25% towards your final grade. The first test will be held on the evening of Tuesday 1st September and the second test will be held on the evening of Tuesday 27th October. The location of the tests will be announced closer to the date. These 2 invigilated computer-based tests are practical tests and **all** the questions are answered and validated using CodeRunner3.

Final Exam (paper-based)

The final exam is worth 25% of your final mark and your answers will be hand-written in a Question/Answer booklet. Closer to the exam time you will be able to check Student Services Online for the exam time and date. The exam is closed book, and calculators are not permitted. Provisional results can be obtained from Student Services Online.

OTHER INFORMATION

How to seek assistance

In the labs, there are always tutors and demonstrators available to help you. 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 (Ann Cameron). Students are asked to discuss privately any impairment related requirements face-to-face and/or in written form with the course coordinator or lab supervisor. If you need extra help with understanding the course material, or preparing for the tests or exam, you are very welcome to contact any of the teaching staff (Adriana, Angela, Ann, Damir or Daniel).

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).

Piazza

The Piazza discussion forum within Canvas is regularly monitored by teaching staff. Please make use of the forum to ask any questions related to the course. If your question is of a personal nature, then please contact the teaching staff directly.

Your first lab

Your first lab will be held in the week starting Monday the 3rd of August. There will be tutors and lab demonstrators available throughout all the labs to help you. We are also able to provide online help to students who are not currently living in Auckland due to the current border restrictions.

In order to use any of the computers you will need to log into the system. This will be the username and password which you use to log into Student Services Online. Please bring a pen and a USB Flash drive to every lab.

Write your name on the outside of all your flash drives. It is also a good idea to have a file called "MyContactDetails.txt" with your contact details stored on your flash drive. Several flash drives are left in the lab each week. We will email you if your flash drive is found in the lab, providing it has your name and email address inside (or written on the outside).

Enjoy the course!

Ann, Angela, Adriana, Damir and Daniel
July, 2020