Principles of Programming SS, 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 an understanding of how to represent information both as data and algorithms. Students also 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
- compose functions that perform a specified task into a program that solves a given problem.

INSTRUCTIONAL DESIGN

Programming is traditionally viewed as a subject in which concepts build progressively, so each new concept requires a detailed understanding of the concepts learned previously. Although a number of programming concepts are interrelated, it is possible to separate many of the ideas and to introduce new concepts in a way that relies on little previous knowledge. Additionally, many texts use an approach in which each topic is explored deeply before moving onto the next topic.

This course attempts to present material using a layered approach, in which a broader range of topics is covered initially in a shallow way, then revisited in more depth at later stages. This approach provides a more gradual exposure to the core ideas and allows learning to continue when a particular topic is not well understood.

The programming concepts are introduced primarily through the use of examples. Students are strongly encouraged to practise these examples by typing them into a computer and modifying them to get some hands-on experience.

TEACHING STAFF

Below is the contact information of the four people involved with the teaching of CompSci101 in Summer School, 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

CompSci 101, Summer School, 2020				
Date	**Lecture**	**Proposed Schedule**	**Lab**	
06-Jan	1	Introduction	**No Lab**	Find the Lab room (303S-279)
07-Jan	2	Variables, program execution, doing calculations, print()		
08-Jan	3	Expressions, mathematical operators, the math module		
	4	The type() function, strings, objects, len(), string slices		
09-Jan	5	Manipulating strings, String methods, dot notation	**Lab 1**	Calculations
10-Jan	6	User input, converting between types, random numbers		
Saturday/Sunday				
13-Jan	7	Defining functions Part 1	**Lab 2**	Strings, Random numbers
14-Jan	8	Defining functions Part 2		
15-Jan	9	Code tracing, divide a program into separate tasks		
	10	Boolean expressions, if statements, equality and floats		**Assignment 1 Due**
16-Jan	11	if ... else, if ... elif statements, nested ifs	**Lab 3**	Functions
17-Jan	12	while loops		
Saturday/Sunday				
20-Jan	13	The Python range() function, for ... in loops	**Lab 4**	If statements, while loops
21-Jan	14	Lists, for in loops to iterate through the elements of a list		
22-Jan	15	The split() function, lists are mutable objects		**Assignment 2 Due**
	16	Slicing lists, list methods		**Online Test 1 (Evening)**
23-Jan	17	Assignment 3 discussion	**Lab 5**	for loops, lists, range function
24-Jan	18	Tuples		
Saturday/Sunday				
27-Jan		**Auckland Anniversary Day - No Lecture**	Monday labs move to Wednesday	
28-Jan	19	Open, read, write and close file	**Lab 6**	List methods
29-Jan	20	Processing the information from text files		
	21	Dictionaries		**Assignment 3 Due**
30-Jan	22	Using dictionaries	**Lab 7**	Tuples and File Processing
31-Jan	23	Nested For loops, Passing mutable objects as parameters		
Saturday/Sunday				
03-Feb	24	tkinter 1 - GUIs, using the Canvas widget	**Lab 8**	Dictionaries
04-Feb	25	tkinter 2 - Drawing shapes using nested loops		and Nested For Loops
05-Feb	26	Revision for Test 2		
				Assignment 4 Due
06-Feb		**Waitangi Day - No lecture**	**No Lab**	
07-Feb		**No lecture**		**Online Test 2 (Evening)**
Saturday/Sunday				
10-Feb	27	Using the Python interpreter, Python sequences	**Lab 9**	Tkinter, drawing shapes
11-Feb	28	Testing, docstrings for functions, doctests		
12-Feb	29	Revision for the CompSci 101 Exam - Last lecture		
13-Feb		**No Lecture**	**No Lab**	
14-Feb		**No Lecture**		**Assignment 5 Due**
Saturday/Sunday				
		Exam Period (Feb 17 - Feb 19)		

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 CodeRunner 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

The laboratories are worth 9% of your final mark. Your first lab will be either on Thursday January 9th or Friday January 10th depending on which lab you enrolled in. Attendance at the labs is compulsory. Every laboratory session contributes towards your final grade. Please keep your signed lab sheet as proof of lab attendance.

Please note that on SSO, your Monday/Tuesday lab is labelled "Lab" and your Thursday/Friday lab is labelled "Tut" but they are both labs. The labs are designed to give you practical experience with the basic concepts which you have learnt in lectures. They will include activities to be completed during the laboratory session. CodeRunner will be used for some of the exercises to check for correctness but tutors will be checking your code for good style also.

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.

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):

Assignment 1: due 4:30pm on Wednesday, 15th January
Assignment 2: due 8:30am on Wednesday 22nd January
Assignment 3: due 4:30pm on Wednesday 29th January
Assignment 4: due 4:30pm on Wednesday 5th February
Assignment 5: due 4:30pm on Friday 14th February

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 CodeRunner tool to submit your assignment. Submissions are marked by CodeRunner running a series of test cases of the code in a sandbox and comparing the output with the expected output.

Timed CodeRunner Questions

After everyone has had their lab, there will be a timed CodeRunner 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.

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 Wednesday 22nd January and the second test will be held on the evening of Friday 7th February. 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. 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 visit any of the teaching staff either during their office hours or at some other 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).

Missed exam or test

If you miss the exam or one of the invigilated tests for any valid reason, or you sit the exam or test but believe that your performance was impaired for some reason, then you may be able to apply for an aegrotat or compassionate consideration. For more detailed information, refer to the University of Auckland's Calendar or the Examinatons website.

Webmail

All students have a university email account. Your university email address is: `NetID@aucklanduni.ac.nz`, e.g., `abcd001@aucklanduni.ac.nz`. You can access your email from anywhere you have Internet access, by logging into:

http://webmail.ec.auckland.ac.nz

You must read email sent to your university email address regularly, as staff members often send important messages to students via their university email address. When emailing staff members, please use your university email address.

The CompSci 101 Website

On the COMPSCI 101 website you will find course information, assignments and lecture slides:

http://www.cs.auckland.ac.nz/courses/compsci101ssc/

Lecture Recordings

Recorded lectures can be found on Canvas.

Checking your marks on Canvas

You can check your marks by logging onto Canvas. If there are any problems with your marks, please contact Ann Cameron.

Policy on Cheating and Plagiarism

Cheating is viewed as a serious offence by the University of Auckland. Penalties are administered by the Discipline Committee of the Senate, and may include suspension or expulsion from the university. Do not copy anyone else's work, or allow anyone else to copy from you.

For more information on the University's policy on cheating, please refer to the web page:

http://www.auckland.ac.nz/uoa/home/about/teaching-learning/honesty

Do not ever copy anyone else's work, or allow anyone else to copy from you. Do not ever give a copy of your work to anyone else.

Piazza

The Piazza discussion forum within Canvas is regularly monitored by teaching staff. Please make use of the forum 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.

Your first lab

Your first lab will be either on Thursday January 9th or Friday January 10th, depending on the lab that you have enrolled in. When you arrive at the lab, you should sign next to your name on the lab noticeboard. There will be tutors and lab demonstrators available throughout all the labs to help you. 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.

Label all your flash drives on the outside. 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!