

The current and official versions of the course specifications are available on the web at

<http://www.usq.edu.au/course/specification/current>.

Please consult the web for updates that may occur during the year.

## CSC2410 Computational Thinking with Python

### Semester 2, 2019 On-campus Springfield

<b>Short Description:</b>	Computat'I Think'g with Python
<b>Units :</b>	1
<b>Faculty or Section :</b>	Faculty of Health, Engineering and Sciences
<b>School or Department :</b>	School of Agric, Comp and Environ Sciences
<b>Student contribution band :</b>	Band 2
<b>ASCED code :</b>	020199 - Computer Science not elsewhere
<b>Grading basis :</b>	Graded
<b>Version produced :</b>	25 January 2019

## Staffing

Examiner: [Shelly Grist](#)

## Other requisites

Requisite: Knowledge of computing consistent with CSC1401 Foundation Programming

## Rationale

Computational thinking is a core skill across many cross disciplinary fields. Future professionals in management roles as well as data analysts need to understand fundamental computational approaches to problem solving. The topics in this course are intended to introduce students not merely to the coding of computer programs, but algorithmic thinking, data management, the methodology of computer programming, and the principles of good program design including modularity, encapsulation and abstraction. The Python language is used because of its extensive application libraries and its effectiveness and popularity as a modern programming language.

## Synopsis

This course covers fundamental computational problem solving concepts, tools and methodologies. Students will learn how to select an appropriate data type and apply the most appropriate technical processes for a given computational problem. They will also learn how to develop modular code which conforms to the basic principles and practices of software engineering.

## Objectives

On successful completion of this course students should be able to:

1. effectively conduct program designs including modularity, encapsulation and abstraction;
2. differentiate between available data types and demonstrate their appropriate problem application;
3. apply available libraries to solve problems;

4. identify and apply the appropriate technical processes and problem-solving skills to successfully process a variety of data sets.

## Topics

Description	Weighting(%)
1. Overview of Python syntax, semantics and control structures	10.00
2. Functions	20.00
3. Programming with objects	5.00
4. Data structures	25.00
5. File I/O	15.00
6. Libraries	15.00
7. Principles and practices of software engineering	10.00

## Text and materials required to be purchased or accessed

ALL textbooks and materials available to be purchased can be sourced from [USQ's Online Bookshop](#) (unless otherwise stated).

Please [contact us](#) for alternative purchase options from USQ Bookshop.

Guttag, John V 2016, *Introduction to Computation and Programming Using Python: with application to understanding data*, MIT Press.

## Reference materials

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

## Student workload expectations

Activity	Hours
Assessments	58.00
Private Study	60.00
Workshops	52.00

## Assessment details

Description	Marks out of	Wtg (%)	Due Date	Notes
Assignment 1	100	20	14 Aug 2019	
Assignment 2	100	30	16 Oct 2019	
Exam	100	50	End S2	(see note 1)

### Notes

1. This will be a Closed exam. The total working time for the examination is 2 hours. The examination date will be available via UConnect when the official examination timetable has been released.

# Important assessment information

## 1. Attendance requirements:

It is the students' responsibility to attend and participate appropriately in all activities (such as lectures and tutorials) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.

## 2. Requirements for students to complete each assessment item satisfactorily:

To satisfactorily complete an individual assessment item a student must achieve at least 50% of the marks for that item.

## 3. Penalties for late submission of required work:

Students should refer to the Assessment Procedure <http://policy.usq.edu.au/documents.php?id=14749PL> (point 4.2.4).

## 4. Requirements for student to be awarded a passing grade in the course:

To be assured of receiving a passing grade a student must obtain at least 50% of the total weighted marks available for the course (i.e. the Primary Hurdle), and have satisfied the Secondary Hurdle (Supervised), i.e. the end of semester examination by achieving at least 40% of the weighted marks available for that assessment item.

Supplementary assessment may be offered where a student has undertaken all of the required summative assessment items and has passed the Primary Hurdle but failed to satisfy the Secondary Hurdle (Supervised), or has satisfied the Secondary Hurdle (Supervised) but failed to achieve a passing Final Grade by 5% or less of the total weighted Marks.

To be awarded a passing grade for a supplementary assessment item (if applicable), a student must achieve at least 50% of the available marks for the supplementary assessment item as per the Assessment Procedure <http://policy.usq.edu.au/documents/14749PL> (point 4.4.2).

## 5. Method used to combine assessment results to attain final grade:

The final grades for students will be assigned on the basis of the aggregate of the weighted marks obtained for each of the summative items for the course.

## 6. Examination information:

This is Closed examination: Candidates are allowed to bring only writing and drawing instruments into a closed examination.

## 7. Examination period when Deferred/Supplementary examinations will be held:

Any Deferred or Supplementary examinations for this course will be held during the next examination period.

## 8. University Student Policies:

Students should read the USQ policies: Definitions, Assessment and Student Academic Misconduct to avoid actions which might contravene University policies and practices. These policies can be found at <http://policy.usq.edu.au>.

# Assessment notes

1. Students must familiarise themselves with the USQ Assessment Procedures (<http://policy.usq.edu.au/documents.php?id=14749PL>).
2. Referencing in Assignments must comply with the Harvard (AGPS) referencing system. This system should be used by students to format details of the information sources they have cited in their work. The Harvard (APGS) style to be used is defined by the USQ library's referencing guide. These policies can be found at <http://www.usq.edu.au/library/referencing>

## Evaluation and benchmarking

In meeting the University's aims to establish quality learning and teaching for all programs, this course monitors and ensures quality assurance and improvements in at least two ways. This course:

1. conforms to the USQ Policy on Evaluation of Teaching, Courses and Programs to ensure ongoing monitoring and systematic improvement.
2. forms part of the BITC and is benchmarked against the internal USQ accreditation/reaccreditation processes which include (i) stringent standards in the independent accreditation of its academic programs, (ii) close integration between business and academic planning, and (iii) regular and rigorous review.

## Other requirements

1. Computer, e-mail and Internet access:  
Students are required to have access to a personal computer, e-mail capabilities and Internet access to UConnect. Current details of computer requirements can be found at <http://www.usq.edu.au/current-students/support/computing/hardware>.
2. Students can expect that questions in assessment items in this course may draw upon knowledge and skills that they can reasonably be expected to have acquired before enrolling in this course. This includes knowledge contained in pre-requisite courses and appropriate communication, information literacy, analytical, critical thinking, problem solving or numeracy skills. Students who do not possess such knowledge and skills should not expect the same grades as those students who do possess them.

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