

# Software Technology 1

Unit code and version	4483.10
Unit offering option	207371
Study level	Level 1 - Undergraduate Introductory Unit
Credit points	3
Faculty	Faculty of Science and Technology
Discipline	Academic Program Area - Technology
Unit offering details	Semester 2, 2022 , ON-CAMPUS , UC - Canberra, Bruce
Unit convener name and contact details	<p><b>Dr. Girija Chetty</b> Professor, Information Technology and Systems Faculty of Science and Technology <a href="mailto:girija.chetty@canberra.edu.au">girija.chetty@canberra.edu.au</a> (02) 6201 2512/0412310060</p>
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## Academic content

### Unit description

This unit has an emphasis on object-oriented programming, and focusses on solving real world problems by learning to code using object oriented paradigm, and involves creation of reusable software using objects and classes along with procedural programming constructs such as assignment and arithmetic statements, conditional and repetition statements, and arrays and generic collections, as well as conformance to sound object oriented programming principles for creating software components, with inheritance, polymorphism and encapsulation constructs, with handling of events and exceptions, creation of component libraries, building user interaction with file i/o, database, console and graphical user interfaces, and perform basic testing and validation for robust and reliable software creation This unit is co-taught with unit 8995 Software Technology 1 G.

## Learning outcomes

On successful completion of this unit, students will be able to:

1. Learn to code using object-oriented programming paradigm;
2. Create reusable software with an emphasis on creation of objects and classes along with procedural programming constructs;
3. Build reusable software components by conforming to sound OO principles of inheritance, polymorphism and encapsulation);
4. Create robust and reliable software by handling of events and exceptions,
5. Develop software for better user interaction with file input/output, database, console and graphical user interface; and
6. Perform basic testing and validation of developed software for robust and reliable software creation.

## Graduate attributes

1. UC graduates are professional
  - use creativity, critical thinking, analysis and research skills to solve theoretical and real-world problems
2. UC graduates are global citizens
  - make creative use of technology in their learning and professional lives
3. UC graduates are lifelong learners
  - evaluate and adopt new technology

## Skills development

As students of the University of Canberra, you will develop your critical thinking skills, your ability to solve complex problems, your ability to work with others, your confidence to learn independently, your written communication skills, your spoken communication skills and a number of work-related knowledge and skills.

## Prerequisites

None.

## Corequisites

None.

## Accreditation

ACS Accreditation

This unit is part of courses accredited by the [Australian Computer Society \(ACS\)](#)

[Skills Framework for the Information Age \(SFIA\) v8](#)

This unit aligns with the following SFIA professional skills:

- Programming/ software development PROG
- Data Analysis DTAN
- System design DESN
- Testing TEST
- Software Design SWDN

SFIA skills are defined by levels of responsibility, based on autonomy, influence, complexity, business skills, and knowledge. Although this unit may cover knowledge and skills at higher levels, it is expected that graduates of undergraduate degrees will be capable of operating at Level 2 overall.

Seoul Accord

The UC generic attributes address graduate attributes 1, 6, 7, 9, and 10 of the [Seoul Accord](#). The remaining graduate attributes that are covered in this unit are:

2. Knowledge for Solving Computing Problems

3. Problem Analysis

4. Design/Development of Solutions

5. Modern tool usage

#### EA Accreditation

This unit is part of courses accredited by [Engineers Australia \(EA\)](#)

This unit assesses and exposes students to the following Professional Engineer Stage 1 Competencies:

1.1 Comprehensive, theory based understanding – Indicators Assessed: a

1.2 Conceptual understanding – Indicators Assessed: a

1.3 In-depth understanding – Indicators Assessed: a

1.4 Discernment – Indicators Exposed: a, b

1.5 Knowledge – Indicators Assessed: a, b, c; Exposed: d, e, f

1.6 Understanding – Indicators Assessed: a, b,c; Exposed d, e

2.1 Application of established engineering methods – Indicators Assessed: a, d, c, d; Exposed e,f,g,i

2.2 Fluent application of engineering techniques, tools and resources – Indicators Assessed: a,b,c,d,e; Exposed f,g,h,i,j

2.3 Application of systematic engineering synthesis and design processes – Indicators Assessed: a,b; Exposed c,d

2.4 Application of systematic approaches – Indicators Assessed: a,,b,c; Exposed d,e,f

3.1 Ethical conduct and professional accountability – Indicators Assessed: a,b; Exposed c,d

3.2 Effective oral and written communication in professional and lay domains – Indicators Assessed: a, b

3.3 Creative, innovative and pro-active demeanour – Indicators Assessed: a,b; Exposed c

3.4 Professional use and management of information – Indicators Assessed: a; Exposed b, c

3.5 Orderly management of self, and professional conduct - Indicators Assessed: a, d, f; Exposed b, c, e

3.6 Effective team membership and team leadership – Indicators Assessed: a, d, c; Exposed d,e,f

## Timetable of activities

1	<p>Review Of Basic Programming Concepts ( Input/output Statements, Variable Declaration And Assignment, Arithmetic And Logic Statements).</p>	<ul style="list-style-type: none"><li>• Week 1 Learning Activities</li><li>• Lecture: 2 hours</li></ul>

Introduction to Console and Graphical User Interface  
(GUI) programming

2

Decision/selection And Loop/repetition Structures With  
Console And Gui Programming

- Week 2 Learning Activities
- Lecture: 2 hours,  
Tutorial/Lab: 1 hour

3 Functions, Strings, Lists/Arrays and Collections with Console and GUI programming

- Week 3 Learning Activities
- Lecture: 2 hours,  
Tutorial/Lab: 1 hour
- Quiz 1 Submission  
Due (5%)

4 File I/O, Exception and Error Handling with Console and GUI Programming

- Week 4 Learning Activities
- Lecture: 2 hours,  
Tutorial/Lab: 1 hour

5 Designing User Defined Classes and Objects

- Week 5 Learning Activities
- Lecture: 2 hours,  
Tutorial/Lab: 1 hour

6 Reusable Software Design with Encapsulation, Inheritance and Polymorphism

- Week 6 Learning Activities
- Lecture: 2 hours,  
Tutorial/Lab: 1 hour

7 OO Design Patterns

- Week 7 Learning Activities
- Lecture: 2 hours,  
Tutorial/Lab: 1 hour
- Quiz 2 Submission  
Due (5%)

8 Class Free Week

Class Free Week

9 Programming with Database Connectivity Library Classes

- Week 9 Learning Activities
- Lecture: 2 hours, Tutorial/Lab: 1 hour
- Quiz 3 Submission Due (5%)

10 Programming with Data Analysis and Visualisation Library Classes

- Week 10 Learning Activities
- Lecture: 2 hours, Tutorial/Lab: 1 hour

11 Programming with Multiple API Library Classes

- Week 11 Learning Activities
- Lecture: 2 hours, Tutorial/Lab: 1 hour
- Quiz 4 Submission Due (5%)

12 Revision and Final Exam Preparation

- Major Assignment Due (30%)

NOTE: The actual order of presentation of topics may vary from above after week1 and I get to know the student cohort better.

## Unit resources

### Required texts

Prescribed Text:

Fundamentals of Python: First Programs , 2nd Edition

Kenneth A. Lambert

ISBN-10: 1-337-56009-X

ISBN-13: 978-1-337-56009-2

Digital Platform

## **Materials and equipment**

Continous access to personal laptop and Internet throughout the study period

## **Unit website**

Each unit you are enrolled in has an online teaching site in the learning management system UCLearn. You access UCLearn through [MyUC](#).

## **Social Media**

Social media will be used as part of the teaching and learning of this unit, and relates to websites and applications that allow students and staff to create and share material, or interact via social networking activities. This can take many forms including text, images, audio, video, gestures (such as 'liking', 'favouriting', 'following') and other multimedia communications. Students and staff should be aware that social media creates an environment for limitless communication, collaboration, dialogue and information exchange but that there should be an awareness of the 'amplificatory' effect of popular content, which can portray both positive and negative outputs. Students should note that social media is not at the control of the University and, therefore, changes may be made to learning or assessment materials at late notice as a consequence of changes to content or access to the social media platform. Students are warned that there may be possible disturbing content that can be viewed when using social media, that is outside the control of the University. Students who are concerned with the use of social media for privacy or other issues are advised to speak with their unit convener as soon as possible.

For further information please refer to the section on Social Media in the [Assessment Procedures](#).

## **Assessment**

### **Assessment item details**

Lab & Tutorial Participation

#### **Due date**

Every week

#### **Weighting**

10%

## **Additional information**

More information will be provided in lectures and on unit's Canvas site.

## **Assessment details**

Will be evaluated weekly by the tutor. The learning outcome will differ according to the lab activity.

## **Addresses learning outcomes**

On successful completion of this unit, students will be able to:

- 1. Learn to code using object-oriented programming paradigm;
- 2. Create reusable software with an emphasis on creation of objects and classes along with procedural programming constructs;
- 3. Build reusable software components by conforming to sound OO principles of inheritance, polymorphism and encapsulation);

- 4. Create robust and reliable software by handling of events and exceptions,
- 5. Develop software for better user interaction with file input/output, database, console and graphical user interface; and
- 6. Perform basic testing and validation of developed software for robust and reliable software creation.

## Related graduate attributes

Quiz 1

### Due date

Friday Week 3

### Weighting

5 %

### Assessment details

Programming Quiz/Test

### Addresses learning outcomes

On successful completion of this unit, students will be able to:

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- 3. Build reusable software components by conforming to sound OO principles of inheritance, polymorphism and encapsulation);

## Related graduate attributes

1. UC graduates are professional
  - use creativity, critical thinking, analysis and research skills to solve theoretical and real-world problems
2. UC graduates are global citizens
  - make creative use of technology in their learning and professional lives
3. UC graduates are lifelong learners
  - evaluate and adopt new technology

Quiz 2

### Due date

Friday Week 7

### Weighting

5 %

### Assessment details

Programming Quiz/Test

### Addresses learning outcomes

On successful completion of this unit, students will be able to:

- 1. Learn to code using object-oriented programming paradigm;
- 2. Create reusable software with an emphasis on creation of objects and classes along with procedural programming constructs;
- 3. Build reusable software components by conforming to sound OO principles of inheritance, polymorphism and encapsulation);

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**Major Assignment**

## Due date

Friday Week 12

## Weighting

30%

## Assessment details

It will be a programming project assignment in Python where student needs to submit their assignment on Friday week 12.

More Information will be provided in lectures and on unit's canvas site

## Addresses learning outcomes

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- 1. Learn to code using object-oriented programming paradigm;
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## Quiz 3

### Due date

Friday Week 9

### Weighting

5%

### Assessment details

Programming Quiz/Test

### Addresses learning outcomes

- 4. Create robust and reliable software by handling of events and exceptions,
- 5. Develop software for better user interaction with file input/output, database, console and graphical user interface; and
- 6. Perform basic testing and validation of developed software for robust and reliable software creation.

### Related graduate attributes

1. UC graduates are professional
  - use creativity, critical thinking, analysis and research skills to solve theoretical and real-world problems
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3. UC graduates are lifelong learners
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## Quiz 4

### Due date

Friday Week 11

### Weighting

5 %

### Assessment details

Programming Quiz/Test

### Addresses learning outcomes

- 4. Create robust and reliable software by handling of events and exceptions,
- 5. Develop software for better user interaction with file input/output, database, console and graphical user interface; and
- 6. Perform basic testing and validation of developed software for robust and reliable software creation.

### Related graduate attributes

1. UC graduates are professional
  - use creativity, critical thinking, analysis and research skills to solve theoretical and real-world problems
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#### Final Exam

### Due date

University Exam Period

### Weighting

40 %

### Assessment details

Proctorio invigilated Computer based Online exam (2 hour duration)

### Addresses learning outcomes

On successful completion of this unit, students will be able to:

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- 2. Create reusable software with an emphasis on creation of objects and classes along with procedural programming constructs;
- 3. Build reusable software components by conforming to sound OO principles of inheritance, polymorphism and encapsulation);
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### Submission of assessment items

Late Submission of assignments:

1. Late submission of Assignment will subject to the university late submission policy.

### Extensions

Students can apply for an extension to the submission due date for an assessment item due to extenuating, evidenced circumstances (specific details are found in the [Assessment Procedures](#)). An extension must be applied for before the due date. Documentary evidence (e.g. medical certificate) will be expected for an extension to be granted, however this will not guarantee that the application will be successful. The Unit Convener or relevant Program Director/Course Convener will decide whether to grant an extension and the length of the extension.

An Assignment Extension form is available from the [Student Forms](#) page.

## Late submissions

The following late submission period and penalty is applicable to any teaching period commencing after 1 April 2024.

To support the provision of timely feedback to students within the unit, late penalties will apply for summative assessments where late submission is permitted. Late submissions without an approved extension or reasonable adjustment will result in a penalty of a mark reduction of 10% of the maximum available marks for the assessment item per day (or part thereof) up to and including three calendar days. If a student submits more than three calendar days late without an approved extension or reasonable adjustment, the student will be allocated a mark of zero for that assessment, with no feedback provided.

Approval of extensions based on extenuating circumstances will be dependent upon the production of supporting documentation and at the discretion of the unit convener.

For teaching periods commencing prior to 1 April 2024, a late penalty of 5 % of the maximum available marks for the assessment item per day (or part thereof) was applied up to and including seven calendar days. An assignment submitted over 7 days late will not be accepted.

## Special assessment requirements

To Pass the Unit, you will need to satisfy the following conditions:

1. Sit for all Quizzes, do the Final exam and submit the lab work and major assignment, and have no outstanding resubmissions by Friday of week 12.
2. In the case of illness, misadventure or unavoidable commitments at the scheduled time of an examination, students should contact the Unit Convener as soon as possible. (Well in advance if possible).

Once above conditions have been satisfied, grades will be awarded as per the following table:

Grade	Formula for Grade Calculation
HD	Total Mark $\geq$ 85 AND Final Exam Mark $\geq$ 50
DI	Total Mark $\geq$ 75 AND Final Exam Mark $\geq$ 50
CR	Total Mark $\geq$ 65 AND Final Exam Mark $\geq$ 50
P	Total Mark $\geq$ 50 AND Final Exam Mark $\geq$ 50
NX	Total Mark $<$ 50 OR Final Exam Mark $<$ 50

- The student's final grade is based on the Total Mark, obtained as the sum of all the assessment items Quiz 1, Quiz2, Quiz 3, Quiz 4, Lab Work, Assignment and Final Exam Mark.
- However, You have to pass the final exam (Final Exam Mark  $\geq 50\%$ ) to pass the unit.
- If you fail the final exam ((Final Exam Mark  $< 50\%$ ), irrespective of your Total Mark, and marks in each assessment component (quizzes, lab work and assignment), your final grade for the unit will be NX.
- The unit convener reserves the right to question students orally on any of their submitted work.

## **Supplementary assessment**

Refer to the [Assessment Policy](#) and [Assessment Procedures](#)

Supplementary assessment is not offered in this unit unless required by the relevant university policy.

## **Academic integrity**

Students have a responsibility to uphold University standards on ethical scholarship. Good scholarship involves building on the work of others and use of others' work must be acknowledged with proper attribution made. Cheating, plagiarism, and falsification of data are dishonest practices that contravene academic values. Refer to the University's [Student Charter](#) for more information.

To enhance understanding of academic integrity, all students are expected to complete the Academic Integrity Module (AIM) at least once during their course of study. You can access this module within [UCLearn \(Canvas\)](#) through the 'Academic Integrity and Avoiding Plagiarism' link in the [Study Help site](#).

## **Use of Text-Matching Software**

The University of Canberra uses text-matching software to help students and staff reduce plagiarism and improve understanding of academic integrity. The software matches submitted text in student assignments against material from various sources: the internet, published books and journals, and previously submitted student texts.

## **Student responsibility**

### **Learner engagement**

Weekly lecture: 2 hours/week, 12 times	24
Weekly tute/lab/: 1 hour preparation + 1 hour attendance per tute/lab, 11 times	22
Reading/Watching recommended web resources	5
Homework (tutorials/work not completed in class)	19
Major Assignment	32
Quizzes	40
Independent Study	8
Total	150

## **Inclusion and engagement**

It is strongly recommended that students who need assistance in undertaking the unit because of disability or an ongoing health condition register with the [Inclusion and Engagement Office](#) as soon as possible so that reasonable adjustment arrangements can be made.

## **Participation requirements**

Your participation in lectures, workshop and tutorial and lab activities will enhance your understanding of the unit content and therefore the quality of your assessment responses. Lack of participation may result in your inability to satisfactorily complete assessment items.

## **Withdrawal**

If you are planning to withdraw please discuss with your Unit Convener. UC College students must also seek advice from the College.

## Required IT skills

Ability to use the computer and have a basic knowledge of computers.

## In-unit costs

Continuous access to personal laptop and Internet off-campus and on-campus

## Work integrated learning

NA

## Additional information

NA

## Student feedback

All students enrolled in this unit will have opportunities to provide anonymous feedback on the unit through the InterFace Student Experience Questionnaire (ISEQ). The request for your feedback will be posted on your InterInterface page at least twice during a teaching period. InterInterface can be accessed through MyUC.

## Changes to unit based on student feedback

Inclusion of a prescribed digital text was made after the student feedback from the previous semester, to increase the continuous engagement with the subject matter, content, and have an enhanced learning experience.

## Authority of this unit outline

This unit outline must be read in conjunction with the University of Canberra's Policies and Procedures, including the [Assessment Policy](#) and associated [Procedure](#). The Assessment Policy and Assessment Procedure include information on matters such as plagiarism, grade descriptors, moderation, feedback, and deferred exams.

Any change to the information contained in the Academic content and Assessment sections of this document, will only be made by the Unit Convener if the written agreement of the Program Director and a majority of students has been obtained; and if written advice of the change is then provided on the teaching site in UCLearn. If this is not possible, written advice of the change must be then forwarded to each student enrolled in the unit at their registered term address. Any individual student who believes themselves to be disadvantaged by a change is encouraged to discuss the matter with the Unit Convener.

## Authority Text

Main

Exception – Potential changes to a unit's learning activities and assessment items (Approved Academic Board 2020)

In the event of Australian Government and/or ACT Government directive, such as those requiring physical distancing and restrictions on movement because of a pandemic, learning activities and/or assessment items in some units may change. These changes will not be updated in the published Unit Outline but will be communicated to students via the unit's UCLearn (Canvas) teaching site. The new learning activities and/or assessment items will continue to meet the unit's learning outcomes, as described in the Unit Outline.

New learning activities and/or assessment items will be available on the unit's UCLearn (Canvas) teaching site. Please contact the Unit Convener with any questions.

**Printed on 04, June, 2024**

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CRICOS 00212K

TEQSA Provider ID: PRV12003 (Australian University)

UC acknowledges the Ngunnawal people, traditional custodians of the lands where Bruce campus is situated. We wish to acknowledge and respect their continuing culture and the contribution they make to the life of Canberra and the region. We also acknowledge all other First Nations Peoples on whose lands we gather.