

## UNIT SPECIFICATION

# Introduction to Programming

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# Introduction to Programming

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## Unit Summary

Introduction to programming is a rapid prototyping workshop series that introduces the fundamentals of Python programming. You encounter the first principles of coding from computational thinking through to key elements such as variables, conditionals, loops, arrays, and functions. We assume little to no prior experience of coding on entry. You learn Python programming from the ground up, working through coding challenges and creative briefs that help embed new techniques and best practices into your programming 'toolkit'.

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## Learning Outcomes

- LO1.** An understanding of the key features of programming including input, output, maths, sequence, iteration, and repetition.
  - LO2.** The application of coding conventions to ease the review, maintenance, troubleshooting, and debugging of the developed software.
  - LO3.** The successful implementation of a prototype system that is driven by procedural programming techniques.
  - LO4.** An ability to specify applications, discuss their technical implementation and reflect critically on the results.
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## Unit Content

The module covers the following topics including a primer in algorithmic thinking, through to learning the fundamentals of programming concepts:

- Logic & Algorithmic thinking
- Version control basics
- Data Types
- Basic user interactivity
- Operators
- Conditional statements (if, if-else, switch)
- Control flow statements (while, do-while, for)
- Numbers, Strings
- Tuples, Sets
- Arrays
- Functions (passing in, returning out)

## Teaching & Delivery

Tuition and guidance should feature flexible approaches to delivering the unit. Formal tuition sessions, whether face to face or online, will identify some of the required, theoretical subject matter. This will help students to work individually, or as part of a group, researching and gathering information about the subject. The Module will be taught through weekly tutorials and will include tutor-led and student-cantered activities. Reflective learning based on defined experience situations will be used to promote self-development. Students will likely use tutor- and self-directed study and reflect on their experience and expertise. Up-to-date information and materials are available from many sources such as businesses, the World Wide Web, television and radio broadcasts, broadsheet newspapers and advisory services.

## Assessment

The following assessment strategies may be adopted to achieve the learning outcomes

### PORTFOLIO

S1. Programming Skills Portfolio	40%
S2. Utility App	60%

## Learning Resources

The recommended sources listed below should be familiar to each tutor and assessor who is delivering this unit. Learners should be made aware of these sources before delivery of this unit, and be fully conversant with these sources upon completion of this unit.

- Beecher, K. (2017). Computational Thinking: A beginner's guide to problem-solving and programming
- Adam Stewart, (2016). Python Programming for Beginners
- Aron Asadi, S. (2016). The Ultimate Guide to Code with Python (e-book).
- Savitch, W & Mock, K. (2015). Problem Solving with C++, Global Edition (e-book). Pearson Education.
- Savitch, W. (2016). Absolute C++, Global Edition (e-book). Pearson Education.