

Module Details	
Module Title	Software Development
Module Code	COS7009-B
Academic Year	2023/4
Credits	20
School	Department of Computer Science
FHEQ Level	FHEQ Level 7

Contact Hours	
Type	Hours
Laboratories	24
Lectures	12
Directed Study	164

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 1

Module Aims
<p>A concise introduction to the module's purpose.</p> <p>Software solutions enable computers to function efficiently and accurately in tasks such as automating processes, collecting data, analysing information and decision making on real-world issues relating to such as social justice, climate change, spread and control of epidemics, prediction of natural disasters, etc. This module offers an ideal introduction to programming knowledge and skills required for developing software solutions for data science, Artificial Intelligence (AI) and related areas.</p>

## Outline Syllabus

### Key topics:

- Programming fundamentals
- Data type: sequences
- Data type: collections
- programming paradigm: Object-oriented
- Programming paradigm: functional programming
- I/O: Files and Exceptions
- Software Testing

All topics will require critical thinking, problem solving, analysis, and creativity in the process of software development.

## Learning Outcomes

Outcome Number	Description
LO1	Demonstrate an advanced and systematic knowledge of design and development through testing of software applications using object-oriented principle.
LO2	Analyze and effectively use integrated development environment.
LO3	Apply modern paradigms to software development transferring theoretical concepts to practical applications.
LO4	Solve complex software development problems both systematically and creatively.

## Learning, Teaching and Assessment Strategy

Utilising current research and case studies on the topic of Software Development using Python as the programming language, the students will participate in lectures, labs and independent study to explore concepts and solve real-world problems. The teaching and learning methods have been selected to engage students in developing their knowledge and understanding of Software Development through formal learning opportunities such as timetable teaching sessions, , and informal and social learning through team-working on mini projects for lab related work. In addition to the modules, academic skills workshops will be organised during the year to provide further support in the development of essential skills such as digital literacy.

To support accessibility, clarity and comprehension all teaching material is provided online in advance of the teaching sessions. Throughout the programme, lots of opportunities are provided for students to design their own solutions and to express their own ideas, choosing from a variety of tools and methodologies. An emphasis is also placed on the importance of planning and goal setting, allowing students to forge a learning pathway that is suitable for their needs, while respecting the requirements of programme, and the needs of others, when working within a team.

The University recognises the importance of providing pastoral support, taking into consideration all aspects of our students' journeys and development. All students are allocated a personal academic tutor, with whom they meet regularly to discuss and receive guidance on their learning and development.

To prepare the students ready for world of work, formative assessments are designed to develop industry ready skills such as programming skills, team-work skills (using informal/formative group work to strengthened students' ability to work effectively in teams) and peer evaluation. Throughout the module, students will be set formative assessment activities that will help develop confidence in computer programming and in the use of integrated design environment. The timely constructive feedback from this formative assessment will support students develop the skills and knowledge required for the summative assessment.

The module will be summative assessed through an MCQ test in the lab, assessed during the module, to help evaluate and solidify students' understanding of learning to date. This will be followed by a computer-based assessment which test skills, practical understanding and theoretical concepts on: Object-oriented concepts and applications, Basic Algorithms, Data structure, Functional Programming in depth.

If a student requires supplementary assessment for re-assessment, they will be set a range of tasks based on a supplementary scenario and data set to demonstrate evidence for the required learning outcomes.

### Mode of Assessment

Type	Method	Description	Weighting
Summative	Examination - MCQ	MCQ	50%
Summative	Computer-based assessment	Programming exercises	50%

### Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>

#### *Please note:*

*This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.*

