

| Module Details |                                |
|----------------|--------------------------------|
| Module Title   | Software Development           |
| Module Code    | COS7009-B                      |
| Academic Year  | 2022/3                         |
| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| 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. |

| Outline Syllabus                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| <p>Key topics:</p> <ul style="list-style-type: none"> <li>-Programming fundamentals</li> <li>-Data type: sequences</li> <li>-Data type: collections</li> <li>-programming paradigm: Object-oriented</li> <li>-Programming paradigm: functional programming</li> <li>-I/O: Files and Exceptions</li> <li>-Software Testing</li> </ul> <p>All topics will require critical thinking, problem solving, analysis, and creativity in the process of software development.</p> |

| Learning Outcomes |                                                                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Outcome Number    | Description                                                                                                                                           |
| 1                 | Demonstrate an advanced and systematic knowledge of design and development through testing of software applications using object-oriented principles. |
| 2                 | Analyse and effectively use an integrated development environment.                                                                                    |
| 3                 | Apply modern paradigms to software development transferring theoretical concepts to practical applications.                                           |
| 4                 | Solve complex software development problems both systematically and creatively.                                                                       |

| Learning, Teaching and Assessment Strategy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| <p>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 lectures and labs, experiential learning through lab 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 self-regulation, persistence, and the development of essential skills such as digital literacy.</p> <p>To support accessibility, clarity and comprehension all teaching material is provided online in advance of the teaching sessions wherever possible. 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.</p> <p>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.</p> <p>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.</p> |

| Mode of Assessment |                          |                                                   |           |
|--------------------|--------------------------|---------------------------------------------------|-----------|
| Type               | Method                   | Description                                       | Weighting |
| Summative          | Computerised examination | Lab-based multiple choice question test (2 hours) | 50%       |
| Summative          | Computerised examination | Programming exercises assessment (2 hours)        | 50%       |

| Reading List                                                                                                                                             |
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| To access the reading list for this module, please visit <a href="https://bradford.rl.talis.com/index.html">https://bradford.rl.talis.com/index.html</a> |

*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.*

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