UNIVERSITY of BRADFORD

Module Descriptor

| Module Details | |
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| Module Title | Technical and Professional Skills |
| Module Code | COS4015-B |
| Academic Year | 2024/5 |
| Credits | 20 |
| School | School of Computer Science, AI and Electronics |
| FHEQ Level | FHEQ Level 4 |

| Contact Hours | |
|---|---|
| Type | Hours |
| Online Tutorials (Synchronous) | 12 |
| Tutorials | 12 |
| Laboratories | 12 |
| Directed Study | 152 |
| Lectures | 24 |

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

## Module Aims

In order to face the growing challenges of the IT industry, it is essential that students equip themselves with the necessary skills and demonstrate that they have these skills when applying for graduate level jobs. In particular, problem solving and decision making as well as a good understanding of IT-related professional issues are likely to be essential aspects of a graduate-level job, as employers rely on ability to analyse a situation and decide on a course of action that is aligned with the industry standards and in compliance with legal, ethical, and professional requirements.

This module will provide students opportunities to develop their technical and professional skills necessary for success in a Honours level Computing programme and beyond. It also enhances their employment prospects by (i) providing analytical skills essential to design algorithms for solving various problems, (ii) providing an understanding of techniques and skills required to develop computing programmes, (iii) introducing the basics of shell programming, (iv) providing an overview of fundamental subject specific concepts and history of computing, (v) raising awareness of, and interest in, legal, social, ethical, and professional issues, and (vi) equipping students with a range of academic, professional, technical, transferable and employability skills.

| Outline Syllabus |
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| A broad introduction to, and overview of, the discipline of computing. Basic Linux shell programming. Algorithm development for solving various computing problems and computational complexity analysis. Design and implementation of computer applications as a team-based exercise. Introduction to Python. Library and information skills using suitable tools. Reflective and scientific academic writing and referencing. Plagiarism awareness. Aspects of code of ethics, professional conduct, copyright, open source, patents, piracy, privacy and GDPR. |

| Learning Outcomes | |
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| Outcome Number | Description |
| 01 | Outline the importance of key skills for professionals from a subject specific point of view. |
| 02 | Develop algorithmic problem solving skills; design and develop software programmes and computer applications; analyse the computational complexity. |
| 03 | Understand legal, social, ethical, and professional issues within the context of computer science and IT and responsibilities around these issues and plagiarism awareness. |
| 04 | Apply a range of communication skills including collaborative working. |
| 05 | Demonstrate report writing skills. |

## Learning, Teaching and Assessment Strategy

To achieve the intended learning outcomes, the teaching and learning methods have been selected to engage students in developing their knowledge and understanding of Technical and Professional Skills through formal learning opportunities such as lectures, experiential learning through practical lab and PAT sessions, and informal and social learning through team-working in coursework. Lectures introduce the concepts, principles and theories and provide guidance on the availability of supporting resources within the University for individual professional development. Labs incorporate both tutorials and practical exercises aimed at introducing and improving key skills. Activities in labs range from problem solving to interactive sessions. Directed reading enables the development of study skills and support the material covered in lecture sessions.

The progress of the students is closely monitored and supported by the academic team and demonstrators during the laboratory practical sessions as well as PAT sessions and timely formative feedback is provided to support student/team learning. The students are expected to work independently outside the scheduled teaching sessions.

To support accessibility, clarity and comprehension, all teaching material is provided online in advance of the teaching sessions. The practical activities are designed to encourage the use of modern tools and applications (such as Cygwin, Anaconda, Netbeans, Visio, etc.) to enhance student learning and experience. Throughout the module, 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.

Students will gain professional and communication skills by developing problem solving skills, coding skills, report writing skills, team-work skills (using group coursework to strengthened students? ability to work effectively in teams), and presentation skills (through demos).

The module will be summatively assessed through 2 courseworks: Group-based development of a prototype and Individual reflective and scientific report. Supplementary Assessment as original with the group element substituted by individual. The assessments are designed to simulate typical problem-solving tasks in real-world and meet the requirements of British Computer Society, the accrediting body of our computer programmes. Students? understanding of the problems to be solved, the ability to provide good solutions and practical communication skills are assessed through the demonstration of the code functionality and the report. A detailed marking scheme is made available to the students in advance. The assessments take into account both team contribution as well as individual performance. The team contribution is based on the outcomes produced: code, report and demo. Individual assessment results from the overall contribution based on peer-review as well as the observations made by supervisors during the demo assessment.

To prepare the students ready for world of work, the assessments are designed to measure industry ready skills such as problem solving skills, coding skills, report writing skills, team-work skills (using group coursework to strengthened students? ability to work effectively in teams). Throughout the module, students will be set formative assessment and feedback activities that will support students develop the skills and knowledge required for the summative assessments.

## Mode of Assessment

| Type | Method | Description | Weighting |
|---|---|---|---|
| Summative | Coursework - Written | Group-based development of a prototype. SUPP if required: Individual contribution | 50% |
| Summative | Coursework - Written | Individual reflective and scientific report on a computer science topic | 25% |
| Summative | Coursework - Written | Weekly lab and tutorial tasks | 25% |
| Formative | | Formative feedback provided for the tasks that need to be completed during the lab and PAT sessions Formative feedback provided for the scientific report (cw2). | N/A |

| Reading List |
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| 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.*

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