Programme Specification

Computer Science (Smart Devices) {Foundation} [GCET]

Version: 2022-23, v2.0, 11 Mar 2024

Contents

Section 1: Key Programme Details

Part A: Programme Information

Programme title: Computer Science (Smart Devices) {Foundation} [GCET]

Highest award: BSc (Hons) Computer Science (Smart Devices)

Interim award: BSc Computer Science (Smart Devices)

Interim award: DipHE Computer Science (Smart Devices)

Interim award: CertHE Computer Science

Awarding institution: UWE Bristol

Affiliated institutions: Global College of Engineering and Technology (GCET)

Teaching institutions: Global College of Engineering and Technology (GCET)

Study abroad: No

Year abroad: No

Sandwich year: Yes

Credit recognition: No

School responsible for the programme: FET Dept of Computer Sci & Creative Tech, Faculty of Environment & Technology

Professional, statutory or regulatory bodies: Not applicable

Modes of delivery: Full-time, Sandwich

Entry requirements: Applicants holding the following qualifications are eligible to apply for entry to Level 0 of the programme:
Thanawiya amma (General Secondary School Certificate) or the one year certificate with an overall mark of 70%, or above
Thanawiya amma (General Secondary School Certificate) with an overall mark of 65% or above PLUS a mark of over
60% in each stage of the GCET Foundation Studies Programme PLUS a minimum overall score of IELTS 5.5, or equivalent

Further details of entry requirements for applicants holding the IB Diploma or A Levels can be found at http://www1.uwe.ac.uk/whatcanistudy/applyingtouwe/undergraduateapplications/entryrequirements.aspx.

Applicants holding more advanced qualifications may be considered for entry to the programme with advanced standing on an individual basis.

For implementation from: 01 September 2021

Programme code: G50N13

Section 2: Programme Overview, Aims and Learning Outcomes

Part A: Programme Overview, Aims and Learning Outcomes

Overview: This programme provides a flexible, employer-facing education in Computer Science.
Through modern teaching methods the programme supports students to use complex algorithms, implement software on state of the art platforms and explore big data. Suitably designed and selected modules offer students the opportunity to specialise their knowledge.

All our graduates will leave with familiarity of the basic tools and concepts of modern AI. Some of our graduates will have taken the opportunity to leave with advanced skills in AI and Data Analytics ready to meet the worldwide skills shortage in this area, while others might explore the evolving world of Smart Devices; making this programme valuable for the home and the overseas educational market.

Features of the programme:

Educational Aims: This programme aims to:

Develop able and enabled graduates who contribute to their profession and society.

Develop competent software developers who can explore and make use of new technologies as they emerge.

Develop graduates who have the skills and habits of thinking that allow for life-long learning.

Develop graduates who are equipped to make a contribution to the discipline either through research or practice.

Develop graduates who recognise their ethical and professional responsibilities.

Programme Learning Outcomes:

On successful completion of this programme graduates will achieve the following learning outcomes.

Programme Learning Outcomes

PO1. Apply Artificial Intelligence concepts and techniques to offer innovative solutions to problems or to enhance the efficiency and effectiveness of existing systems.

PO2. Be able to use their technical knowledge and skills to contribute to and deliver innovation through independent, self-driven evidence-based enquiry.

PO3. Be able to recognise security threats and their implications, plan actions and design systems to manage them

PO4. Be competent software developers, with excellent problem solving skills and the ability to adapt to different development environments

PO5. Be able to make a significant contribution as a member of a team in the development of computer based systems, offering solutions in a range of application areas.

PO6. Respond to and act upon the ethical, legal and professional implications which they may encounter during their professional lives.

PO7. Be equipped to understand and respond to the changing needs of industry and society

Assessment strategy: This programme uses a range of assessment methods, designed to speak to different leaning styles and to assess not only knowledge and skills but also to develop essential professional attributes such as the ability to work in a group and synthesise work and present it to an audience . While all forms of assessment will be utilised across the full length of studies, the aim is to have students exposed to the full range of assessments and output formats before they reach level 6 of studies, to ensure their performance will not be affected by lack of experience with a new type of assessment.

The assessment regime is designed to scaffold the students' confidence in their abilities and in the assessment process. For example, at level 4 students will experience in-class tests and on-line tests moving on to formal exams as the programme progresses.

Coursework assignments will be in a mixture of individual and group work and will be assessed by a range of outcomes: written essays providing reflective evaluation of individual or group effort; demonstrations of working systems; High level poster presentations; presentations using digital media capabilities will be utilised to demonstrate student achievement. Technical Reports will also be employed to allow students to present the capabilities of a system that have implemented and critically analyse its potential.

Peer assessment will be employed where group work is assessed. This will allow students to develop more balanced evaluation skills, appreciate the needs of project requirements and dynamics and the limitations of collaborative work. It will also support the building of their professional maturity and appreciation of team and work ethics.

Irrespective of the route chosen, throughout the programme there are opportunities for formative feedback as summative assessment is developed, Formative feedback is designed not only to help the students with their learning but also to build their sense of connection and community with their peers and with the academics.

Student support: Teaching and learning strategies to enable learning outcomes to be achieved and demonstrated:
The programme learning outcomes are delivered through an appropriate mix of lecture, tutorial and practical lab-based sessions supported by directed independent learning. Throughout the delivery, fundamental software engineering principles are explored and consolidated through practical lab-based learning. The development of design and modelling skills is embedded in a number of modules at each level. Group work activities and projects are used to add to the development of academic knowledge with the aim of producing well-rounded individuals who understand the demands of the professional environment the will enter as graduates. At appropriate stages of the programme industrial experts are brought in to lead sessions.
At GCET Muscat (Oman), there is a policy for a minimum average requirement of 18 hours/week contact time over the course of the full undergraduate programme. This contact time encompasses a range of face to face activities as described below. In addition a range of other learning activities will be embedded within the programme which, together with the contact time, will enable learning outcomes to be achieved and demonstrated.

In STEM subjects it is recognized that a higher contact time is desirable and so laboratory-based modules have an extra factor included in the time calculation which provides more hours. In addition the level 2 and 3 students have timetabled Peer-Assisted Learning hours, where trained level 2 and 3 students (as appropriate) work with groups. On the BSc(Hons) Computer Science programme teaching is also a mix of scheduled learning and independent learning.

Class Activities

The mode of delivery of a module is determined by its Module Leader, and typically involves a combination of one or more lectures, tutorials, 'lectorials', laboratory classes, group activities and individual project work.
Modules are predominantly delivered by means of large group lectures, supported by

smaller 'lectorials': classes for groups of 20-30 students to allow a closer interaction and discourse with staff.

Academic Support

Academic advice and support is the responsibility of the staff delivering the module in question. Staff are expected to be available outside normal timetabled hours, either by appointment or during published "surgery" hours, in order to offer advice and guidance on matters relating to the material being taught and on its assessment.

Pastoral Care

The College offers pastoral care through two routes:

Academic Personal Tutors: All level 1 students are assigned a an academic member of staff in their department. Students meet individually with their tutor at least twice a year and also participate in group sessions with the Personal Academic Tutor's tutor group
(max size 15) during years 1 and 2. In year 3 project supervisors take on the role of Personal Academic Tutor.

Student Advisers, a team of administrative staff who provide comprehensive, full-time student support service on a drop-in basis or by appointment. Advisers are trained to provide advice on
matters commonly of concern, including regulatory and other matters; the Adviser will, when necessary, advise the student to seek advice to from other professional services including the
university's Centre for Student Affairs or from members of academic staff.

Progression to Independent Study

Many modules require students to carry out independent study, such as research for

projects and assignments, and a full range of facilities are available to help students with these. The philosophy is
accordingly to offer students both guided support and opportunities for independent study. Guided support, mainly in the form of timetabled sessions, takes the form of lectures, tutorials, seminars and practical laboratory sessions. Students are expected to attend all sessions on their timetable, and this is especially important because of the high content of practical work in the programme.

The progression to independent study will also be assisted by the nature of the support offered in individual modules. Typically, module leaders will provide a plan for the module indicating the activities to be carried out and the forms of learning to be undertaken during the delivery of the module, with a view to encouraging students to plan ahead and to take responsibility for managing their time and resources.

Description of the teaching resources provided for students

The College offers a specialised computing facility alongside the general College provision. There is a general PC computing laboratory running Windows and two specialist computing labs. The specialist
laboratories are equipped with the specific software for Computing students; including Software Design Tools development environment, mathematics and statistics packages to support the taught program. The specialist Computing laboratories are designed to target the discipline taught in that area. The College provides a user support Helpdesk. The Helpdesk provides first line support to the users.

Professional Practice and Lab Facilities

Students can access a suite of newly purchased PCs (I7 and I5), modern software, free printing facilities and an IT help desk/line. The General IT lab is open from 8am till 9pm. Besides the College’s plan of extending its IT facilities as the number of students grows, it also has a policy of upgrading 25% of its IT facilities every year.

Technology Enhanced Learning

Staff members in the department are keen adopters of technology to support and enhance student learning. This includes:

Computer based e-assessment implemented in a number of modules, so that students can take regular short tests with automated computer generated feedback.

Recordings of some lectures (audio and video) which are made available after classes via the university's Virtual Learning Environment.

Mathematics Support Centre

The Math Support Centre provides drop-in one-to-one tuition each day and a web-site that provides a portal to a variety of on-line resources in mathematics and statistics.

Programming Support Centre

The Programming Support Centre provides the students support related to Programming modules.

Part B: Programme Structure

Year 1
Full-time and Sandwich students must take 120 credits from the modules in Year 1.

Year 1 Compulsory Modules (Full-time and Sandwich)
Full-time and Sandwich students must take 120 credits from the modules in Compulsory Modules (Full-time).

Module Code	Module Title	Credit
UFCFQN-30-0	Computational Thinking and Practice 2022-23	30

UFCFPN-30-0	Information Practitioner Foundations 2022-23	30
UFCE4A-15-0	Introduction to Creative Technologies 2022-23	15
UFME49-15-0	Introduction to Digital Design 2022-23	15
UFCFTN-30-0	Web Foundations 2022-23	30

Year 2
Full-time and Sandwich students must take 120 credits from the modules in Year 2.

Year 2 Compulsory Modules (Full-time and Sandwich)
Full-time and Sandwich students must take 120 credits from the modules in Compulsory Modules (Full-time).

Module Code	Module Title	Credit
UFCFGS-15-1	Artificial Intelligence I 2023-24	15
UFCFDS-15-1	Computer Systems Architecture 2023-24	15
UFCFFS-30-1	Foundations of Computing 2023-24	30
UFCFHS-30-1	Principles of Programming 2023-24	30
UFCFES-30-1	Web Development and Databases 2023-24	30

Year 3
Full-time and Sandwich students must take 120 credits from the modules in Year 3.

Year 3 Compulsory Modules (Full-time and Sandwich)
Full-time and Sandwich students must take 120 credits from the modules in Compulsory Modules (Full-time).

Module Code	Module Title	Credit
UFCFYR-15-2	Advanced Algorithms 2024-25	15
UFCFCS-30-2	Digital Design 2024-25	30

UFCFBS-15-2	Embedded Systems Programming 2024-25	15
UFCFVK-15-2	Internet of Things 2024-25	15
UFCFWK-15-2	Operating Systems 2024-25	15
UFCF7S-30-2	Systems Development Group Project 2024-25	30

Year 4

Full time students must take 120 credits from the modules in Year 4.
Sandwich students must take 15 credits from the modules in Year 4.

Year 4 Compulsory Modules (Full-time)

Full-time students must take 90 credits from the modules in Compulsory Modules (Full-time).

Module Code	Module Title	Credit
UFCFVR-15-3	Communications and Protocols 2025-26	15
UFCFXK-30-3	Digital Systems Project 2025-26	30
UFCFTR-30-3	Distributed and Enterprise Software Development 2025-26	30
UFCF95-15-3	Entrepreneurial Skills 2025-26	15

Year 4 Compulsory Modules (Sandwich)

Sandwich students must take 15 credits from the modules in Compulsory Modules (Sandwich).

Module Code	Module Title	Credit
UFCFE6-15-3	Professional Experience 2025-26	15

Year 4 Optional Modules Group 1 (Full-time)

Full-time students must take 15 credits from the modules in Optional Modules Group 1 (Full-time).

Module Code	Module Title	Credit

UFCFXR-15-3	Autonomous Agents and Multi-Agent Systems 2025-26	15
UFCFJP-15-3	Big Data Analytics 2025-26	15
UFCF7H-15-3	Mobile Applications 2025-26	15

Year 4 Optional Modules Group 2 (Full-time).
Full-time students must take 15 credits from the modules in Optional Modules Group 2 (Full-time).

Module Code	Module Title	Credit
UFCFWR-15-3	Advanced Systems Programming 2025-26	15
UFCFEL-15-3	Security Data Analytics and Visualisation 2025-26	15

Year 5
Students must take 105 credits from the modules in year 5.

Year 5 Compulsory Modules (Sandwich)
Students must take 90 credits from the modules in Compulsory modules (Sandwich)

Module Code	Module Title	Credit
UFCFVR-15-3	Communications and Protocols 2026-27	15
UFCFXK-30-3	Digital Systems Project 2026-27	30
UFCFTR-30-3	Distributed and Enterprise Software Development 2026-27	30
UFCF95-15-3	Entrepreneurial Skills 2026-27	15

Year 5 Optional Modules (Sandwich)
Sandwich students must take 15 credits from the modules in Optional Modules (sandwich).

Module Code	Module Title	Credit
UFCFWR-15-3	Advanced Systems Programming 2026-27	15

UFCFXR-15-3	Autonomous Agents and Multi-Agent Systems 2026-27	15
UFCFJP-15-3	Big Data Analytics 2026-27	15
UFCF7H-15-3	Mobile Applications 2026-27	15
UFCFEL-15-3	Security Data Analytics and Visualisation 2026-27	15

Part C: Higher Education Achievement Record (HEAR) Synopsis

A graduate of this programme will be equipped with excellent technical and thinking skills thus enabling them to be an innovative problem solver. They will be familiar with a and practised in a range of programming languages and deployment environments. They will be familiar with tools, techniques and methods in Artificial Intelligence. They will have experienced a rich teaching environment and will be practised in professional skills. They will have connected with industry and will be equipped to respond to the future. They will understand their ethical, legal and professional responsibilities as practising technologists.

The graduates of the Sandwich study mode in this programme have developed a diverse set of employability skills through the use of a substantive work-based experience and demonstrate an understanding of the connection between academic learning and professional practice.

Part D: External Reference Points and Benchmarks

The QAA Computing Benchmark Statement The latest QAA Subject Benchmark Statement for Computing was published in October 2019, and is applicable to this proposal. The design team has considered it in drawing up the structure of the programme, and is of the view that the proposal falls clearly within the scope of the benchmarks, as regards curriculum, teaching and learning, and the benchmarking standards
themselves. The benchmark describes the discipline of Computer Science in some detail and this

programme falls squarely within the expressed characteristics. For example, the statement (p 5.) states that, “Computer science provides the necessary knowledge to understand and build computational systems“ and states that its main characteristics include, “fundamental computational concepts and algorithmic thinking, including recursive, distributed and parallel possibilities and attention to the benefits and the limitations of these; the role of these in devising approaches to areas of system design, problem solving, artificial intelligence, simulation and computational modelling recognition of the relationships between the concepts of requirements, specification, design, programme and data (in all its forms) validation and maintenance, as
well as the power of transformation and proof, and the place of these in computing understanding the power behind abstraction, the potential of multiple levels of abstraction and the role this plays in computing.

Understanding the opportunities for and the potential of automation, but also the proper balance between automation and how humans effectively interact with computers, recognising the role of redundancy, diversity and separation of concerns in achieving reliable, usable and secure systems, often in the presence of uncertainty recognising simplicity and elegance as useful concepts and principles” All of the above is covered by this programme. The benchmark also addresses subject-specific skills and teaching, learning and assessment.

The principles embodied with these sections of the benchmark statement have been incorporated into the design of this programme The benchmarks also contain (section 6) statements of the standards expected of graduates at threshold, typical and excellent levels. The team is of the view that the programme is structured in such a way that graduates will meet the required standards. In designing this programme we have made reference to the SEEC credit level descriptors for HE, 2016 http://www.seec.org.uk/wp- content/uploads/2016/07/SEEC-descriptors-2016.pdf and the QAA FHEQ descriptors to ensure that module and programme learning outcomes are expressed in a way that is appropriate to their level.

The UWE Enhancement Framework has helped to frame our thinking in terms of the context in which the students will learn, as has UWE 2030 strategy document.

Part E: Regulations

A: Approved to University Regulations and Procedures

https://www1.uwe.ac.uk/about/departmentsandservices/professionalservices/studentandacademicservices/regulationspoliciesquality/regulationsandprocedures.aspx

It is the Award Board's responsibility to determine whether the student's attainment at FHEQ Level 3 is sufficient to progress to Level 4.