Programme Specification

Computer Science {Dual} [Taylors]

Version: 2024-25, v2.0, Validated

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Section 1: Key Programme Details

Part A: Programme Information

Programme title: Computer Science {Dual} [Taylors]

Highest award: BSc (Hons) Computer Science

Interim award: BSc Computer Science

Interim award: DipHE Computer Science

Interim award: CertHE Computer Science

Awarding institution: Taylor's, UWE Bristol

Affiliated institutions: Taylor's

Teaching institutions: Taylor's

Study abroad: Yes

Year abroad: No

Sandwich year: No

Credit recognition: No

School responsible for the programme: CATE School of Computing and Creative Technologies, College of Arts, Technology and Environment

Professional, statutory or regulatory bodies:

Malaysian Quality Assurance (MQA)

Modes of delivery: Full-time

Entry requirements: For the current entry requirements see the UWE public website.

At TU:
A Levels : CDD or 14 points (A=10, B=8, C=6, D=4, E=2)
STPM : B- C+ C+ or CGPA of 2.44 and above
CPU : 66% Average (6 subjects)

SAM : TER 60
UEC : Aggregate 18 points (6 subjects)
TBF : Successful Completion (50%)
IB : 24 points (6 Subjects)
ADP : 30 Credit Units (minimum CGPA 2.0)

English Language requirement:
IELTS : 6.0 overall
TOEFL : 213 or better [Computer Based]
: 550 or better [Paper Based]
A Levels : Successful Completion
CPU : 60% in English [4C, 3U or 4U]
SAM : Successful Completion
TBF : Successful Completion
UEC : English B4 or better
MUET : Band 4
Others : Successful completion of Pre-University or Diploma which medium of instruction is solely English

For implementation from: 01 August 2024

Programme code: I10K13

Section 2: Programme Overview, Aims and Learning Outcomes

Part A: Programme Overview, Aims and Learning Outcomes

Overview: Graduates in the field of Computer Science would be expected to have an excellent understanding of the internal operation of computers and operating and file systems and a working knowledge of relevant theories and paradigms of computing. They would be able to use appropriate analysis, design and programming tools, languages and methods to develop efficient solutions to computing problems.

Features of the programme:

Educational Aims: BSc (Hons) Computer Science has the following general aims:

To prepare students for entry into the Computer Science profession and the more general challenges of professional and personal life.

To inculcate in students problem-solving and other transferable skills that will be valuable to them in any career.

To prepare students for progression to higher degrees in Computing and in particular Software Engineering.

To continue the development of those general study skills that will enable students to become independent, lifelong learners.

BSc Computing/Computer Science has the following specific aims:

To impart technical skills including requirements analysis, system specification and design (including human-computer interface and database design), programming, and testing.

To impart those skills which will enable a student to manage a software development project; these include: quality management as well as planning, estimating, project monitoring and control.

To encourage students to uphold professional, ethical and social standards and to keep up to date with recent technological and theoretical developments.

To provide exposure to the body of research that underlies the use of computers and to develop familiarity with some major themes within Computer Science.

To develop the students' understanding of the importance of solving complex ill-

defined problems in any domain, though with particular reference to the development of software.

Programme Learning Outcomes:

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

Knowledge and Understanding

A1. Object-oriented programming language concepts; other programming paradigms; syntax and semantics; top-down development; programming to satisfy designs.

A2. Program design concepts, methods, and notations; object-oriented design and other design paradigms; algorithms; design patterns.

A3. Object-oriented and related databases logical and physical database design; database query languages.

A4. The concepts underpinning distributed systems and networks.

A5. The concepts underpinning World-Wide Web technology and web-based application development.

A6. Electronic commerce; architectures and components of commercial applications based upon www technology; technical and management issues.

A7. The concepts underlying the reuse of components and framework in software development; related research issues.

A8. The architecture and main components of computers.

A9. The concepts underpinning user interfaces; good design practice; notation issues; user interface evaluation.

Intellectual Skills

B1. Critical Thinking

B2. Analysis

B3. Synthesis of different types of information

B4. Evaluation

B5. Problem Solving

B6. Appreciate problem contexts

B7. Balance conflicting objective

B8. Construction of logical arguments

B9. Discussion and debate about technical subjects with peers

Subject/Professional Practice Skills

C1. Write programs that conform to requirements and designs

C2. Create high-level and low-level designs that correspond to stated requirements

C3. Design databases to meet application requirements

C4. Create user interfaces for a variety of applications.

C5. Perform adequate tests on programs

C6. Know how to use existing components and frameworks to build new applications

C7. Build web-based programs

C8. Employ a range of tools and notations to support the activities listed above: e.g. editors, compilers, design workbenches, HTML, CGI, Java etc..

Transferable Skills and other attributes

D1. Communication skills: to communicate orally or in writing.

D2. Self-management skills: to manage one's own time; to meet deadlines; t work with others

D3. IT skills in context: to use software tools in the context of application development

D4. Logical reasoning skills: To undertake analysis and interpretation of information in the context of the Computing discipline

D5. Problem formulation: To express problems in appropriate notations

D6. Progression to independent learning: To gain experience of, and to develop skills in, learning independently of structured class work. For example, to develop the ability to use on-line facilities to further self-study

D7. Comprehension of professional literature: to read and to use literature sources appropriate to the discipline to support learning activities.

Assessment strategy: Assessment strategy to enable the learning outcomes to be achieved and demonstrated:

Assessment strategies for Computer Science/Computing focus on ensuring a strong technical knowledge of computing devices, an understanding of the technical underpinnings of computing and the ability to engage with novel computing paradigms.

Student support: At both UWE and TU, student support is provided by academic staff, usually module leaders, for all issues relating to the content and delivery of the module. At UWE, the UWE student advice services provide timely, accurate and confidential advice where necessary on all aspects of the provision including that relating to fees, assessment arrangements, late work and extenuating circumstances procedures, option choice, timetabling, examination and progression counselling and so on, as well as where and how to access the support provided by UWE. Additional support and guidance is provided by Programme Managers who are also responsible for ensuring the collection of and response to student feedback using student representatives and Programme Management Committees.

Further support is provided through the UG administration team, the admissions office, the Students Union, the central University career service and UWE's counselling provision. The UWE placements services provide extensive support for students in preparation for, as well as throughout, their study year abroad and acts both as an intermediary with partner institutions and as a recruitment service for employers.

Students seeking employment opportunities during their studies have access to

UWE's Job Shop and are also encouraged to develop valuable skills by volunteering with the Community Volunteer Service. The UWE international office provides support and organises specific activities to assist international students in adapting to life in the UK, such as an additional induction week, and the provision of specific literature to assist with their study. Further student support is provided by FET through the UG administration team, the Placements Office, the Admissions Office.

All students have a formal induction process to socialise them to university life and to provide them with the means to access the support that they may require during their study at UWE. A student handbook documents this for students. There are a range of central services offered to students. These include: Student Advice and Welfare for advice on finance and UWE's counseling provision; Career Development Unit for careers information; information technology services, student accommodation services, sports facilities, student union services, the Chaplaincy, and the Centre for Performing Arts.

Support to students with disability is offered both at the faculty level under the remit of the Disability Adviser and centrally through UWE's Disability Resource Service. The Disability Adviser coordinates academic support for disabled students in the Faculty. This includes communication of individual student's support requirements to teaching and support staff and advice and recommendations on reasonable adjustments to teaching and assessment. The Disability Adviser also coordinates staff development on disability issues and provides information and advice to academic and support staff and to students in relation to disability issues. Together, these act as a holistic service for disabled students and applicants to UWE and also support the academic and administrative staff members who work with disabled students.

At TU Student Central is responsible for handling matters pertaining to student welfare, counselling, international office and training materials for students. The Counselling Central helps students cope with studies, stress, time management and personal concerns ranging from homesickness to relationship problems. Student Services Department assists students with regards to study loans, scholarships, study grants and other financial assistance during their course of study at TU.

The International Office promotes understanding, cross-cultural learning and appreciation among students from various nationalities, racial and ethnic backgrounds on campus. It provides a comprehensive range of support services to international students to enable them to adapt to the culture and lifestyle of Malaysia. Services offered include course counselling; application and admission; student visa and pass application; airport pickup; orientation and familiarisation; and Immigration advice.

Formed by students for students, the Student Council represents students' 'voice' at TU. The Council plays a very central role in seeking solutions to problems faced by students in the academic and non-academic areas. They also spearhead the organisation of social activities for students. Members of the council are elected by the student body with representation from each programme. The Council is managed by an Executive Committee and advised by an Officer of TU.

The Divisional Office of the various schools is the nerve centre of the school around which all academic activities and student administration revolve. It handles a broad range of activities which include: timetabling; programme information; subject choice counselling; subject registration; student attendance; subject exemptions; course prerequisites; student withdrawal; Student certification letters for loan application and EPF withdrawal; matters relating to fees; and general academic support.

The Career Centre provides various services and programmes to assist students in analysing their career interests, aptitudes, values and goals. It also assists students in career planning and preparation for job interviews, in addition to providing job placement services for graduating students through our network with industry and potential employers It's services include: career counselling; career talks and workshops; resume writing and grooming seminars; career-related fairs and company trips.

An orientation programme is organised for all students prior to the start of the programme. It introduces students to the support available within the School and University, via a range of speakers (e.g. representatives from the Divisional Office,

Student Services, Library, ICT, etc.). An ICT services orientation will introduce students to the email, blackboard and student portal. International students will receive an induction from the International Office. In addition, the Faculty and Department organize induction and transition to UK learning activities appropriate to the cohort's background and needs.

Description of the teaching resources provided for students:

At both UWE and TU all modules have teaching/learning resource booklets or electronic equivalent and most have set texts in accordance with the UWE's Reading Strategy. Additional support is provided through the library and an extensive student computing network. All undergraduate modules use the institutional Blackboard system to thus provide students with 24/7 access to module information and resources on and off campus.

At TU the Learning and Academic Study Skills Centre (LASC) provides generic study skills workshops and personal assistance for students requiring such support. Workshops in (i) Study Skills include note taking, time management, problem solving techniques, writing skills, referencing, studying for examinations, etc; and (ii) 'Soft' skills include Leadership skills, communications skills, resume writing, interview skills, organizational skills, presentation skills, etc.

Part B: Programme Structure

Artificial Intelligence specialism

Year 1
Full time students will study Taylor's modules that are mapped to 120 credits of UWE modules in year 1.

Year 1 Compulsory Modules (Full Time)
Full time students must study Taylor's modules that map to 120 credits of UWE credit from Compulsory Modules (Full Time).

Module Code	Module Title	Credit

UFCFGS-15-1	Artificial Intelligence I 2024-25	15
UFCFDS-15-1	Computer Systems Architecture 2024-25	15
UFCFFS-30-1	Foundations of Computing 2024-25	30
UFCFHS-30-1	Principles of Programming 2024-25	30
UFCFES-30-1	Web Development and Databases 2024-25	30

Year 2
Full time students will study Taylor's modules that are mapped to 120 credits of UWE modules in Year 2.

Year 2 Compulsory Modules
Full time students must take Taylor's modules that map to 120 credits of UWE credit from Compulsory Modules (Full Time).

Module Code	Module Title	Credit
UFCFWK-15-2	Operating Systems 2025-26	15
UFCF9S-15-2	Artificial Intelligence II 2025-26	15
UFCFVK-15-2	Internet of Things 2025-26	15
UFCF8S-30-2	Advanced Software Development 2025-26	30
UFCFAS-15-2	Machine Learning 2025-26	15
UFCF7S-30-2	Systems Development Group Project 2025-26	30

Year 3
Full time students will either:

- study Taylor's modules that are mapped to 120 credits of UWE modules in Year 3.

- Study 120 credits of UWE modules at UWE in Year 3.

Year 3 Compulsory Modules (studied at Taylors)
Full time students will study Taylor's modules that are mapped to 120 credits of UWE modules in Year 3.

Module Code	Module Title	Credit
UFCFJS-15-3	Professional Studies in Computing 2026-27	15
UFCFEL-15-3	Security Data Analytics and Visualisation 2026-27	15
UFCFXK-30-3	Digital Systems Project 2026-27	30
UFCFUR-15-3	Advanced Artificial Intelligence 2026-27	15
UFCFXR-15-3	Autonomous Agents and Multi-Agent Systems 2026-27	15
UFCFTR-30-3	Distributed and Enterprise Software Development 2026-27	30

Year 3 Compulsory Modules (studied at UWE)
Full time students will study 90 credits at UWE from Compulsory Modules (studied at UWE)

Module Code	Module Title	Credit
UFCFXK-30-3	Digital Systems Project 2026-27	30
UFCFTR-30-3	Distributed and Enterprise Software Development 2026-27	30
UFCFXR-15-3	Autonomous Agents and Multi-Agent Systems 2026-27	15
UFCFJS-15-3	Professional Studies in Computing 2026-27	15

Year 3 Compulsory Modules (Studied at UWE) Artificial Intelligence specialism
Full time students will study 30 credits at UWE from Compulsory Modules (studied at UWE) Artificial Intelligence specialism.

Module Code	Module Title	Credit

UFCFEL-15-3	Security Data Analytics and Visualisation 2026-27	15
UFCFUR-15-3	Advanced Artificial Intelligence 2026-27	15

Other specialisms

Year 1
Full time students will study Taylor's modules that are mapped to 120 credits of UWE modules in year 1.

Year 1 Compulsory Modules (Full Time)
Full time students must study Taylor's modules that map to 120 credits of UWE credit from Compulsory Modules (Full Time).

Module Code	Module Title	Credit
UFCFGS-15-1	Artificial Intelligence I 2024-25	15
UFCFDS-15-1	Computer Systems Architecture 2024-25	15
UFCFFS-30-1	Foundations of Computing 2024-25	30
UFCFHS-30-1	Principles of Programming 2024-25	30
UFCFES-30-1	Web Development and Databases 2024-25	30

Year 2
Full time students will study Taylor's modules that are mapped to 120 credits of UWE modules in Year 2.

Year 2 Compulsory Modules
Full time students must take Taylor's modules that map to 120 credits of UWE credit from Compulsory Modules (Full Time).

Module Code	Module Title	Credit
UFCFWK-15-2	Operating Systems 2025-26	15
UFCF9S-15-2	Artificial Intelligence II 2025-26	15
UFCFVK-15-2	Internet of Things 2025-26	15

UFCF8S-30-2	Advanced Software Development 2025-26	30
UFCFAS-15-2	Machine Learning 2025-26	15
UFCF7S-30-2	Systems Development Group Project 2025-26	30

Year 3
Full time students will either:

- study Taylor's modules that are mapped to 120 credits of UWE modules in Year 3.

- Study 120 credits of UWE modules at UWE in Year 3.

Year 3 Compulsory Modules (studied at Taylors)
Full time students will study Taylor's modules that are mapped to 120 credits of UWE modules in Year 3.

Module Code	Module Title	Credit
UFCFJS-15-3	Professional Studies in Computing 2026-27	15
UFCFEL-15-3	Security Data Analytics and Visualisation 2026-27	15
UFCFXK-30-3	Digital Systems Project 2026-27	30
UFCFUR-15-3	Advanced Artificial Intelligence 2026-27	15
UFCFXR-15-3	Autonomous Agents and Multi-Agent Systems 2026-27	15
UFCFTR-30-3	Distributed and Enterprise Software Development 2026-27	30

Year 3 Compulsory Modules (studied at UWE)
Full time students will study 90 credits at UWE from Compulsory Modules (studied at UWE)

Module Code	Module Title	Credit
UFCFXK-30-3	Digital Systems Project 2026-27	30

UFCFTR-30-3	Distributed and Enterprise Software Development 2026-27	30
UFCFXR-15-3	Autonomous Agents and Multi-Agent Systems 2026-27	15
UFCFJS-15-3	Professional Studies in Computing 2026-27	15

Year 3 Compulsory Modules (Studied at UWE) all other specialisms
Full time students will study 30 credits at UWE from Compulsory Modules (studied at UWE) all other specialisms.

Module Code	Module Title	Credit
UFCF7H-15-3	Mobile Applications 2026-27	15
UFCFU3-15-3	Advanced Databases 2026-27	15

Part C: Higher Education Achievement Record (HEAR) Synopsis

Graduates in the field of Computing/Computer Science would be expected to have an excellent understanding of the internal operation of computers and operating and file systems and a working knowledge of relevant theories and paradigms of computing. They would be able to use appropriate analysis, design and programming tools, languages and methods to develop efficient solutions to computing problems.

Part D: External Reference Points and Benchmarks

Reference points/benchmarks (UWE)

The QAA Computing benchmark statements

The QAA Subject Benchmark Statement for Computing was published in 2007, 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 benchmarks (paragraph 2.1) identify a range of types of degrees in computing. At one extreme is a programme that "covers a wide range of topics spanning the entire area of computing". At the other, programmes that "take one very specific aspect of computing and covers it in great depth". This programme resides in the middle of these two extremes providing relatively detailed coverage of a moderately broad subset of computing topics and embraces the three key ideas:

Development of computing systems;

Importance of specialism and position within a broader context;

Balance between theory and practice.

The benchmarks establish a set of Principles of Course Design (paragraph 3.1). This programme, whilst first developed prior to the writing of the benchmarks, nevertheless satisfies these design principles and continues to be revised bearing them in mind.

The benchmarks also contain (section 5) statements of the standards expected of graduates at both modal and threshold levels. The team is of the view that graduates of the programme will be able to meet the required standards, and indeed have done so on earlier versions of the programme.

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of individual modules are to be found in the module specifications.

Reference points/benchmarks (TU)

Three key influences have informed the design of the international awards within the TU:
TU's mission and purpose statements
Statutory Requirements
International Standards

TU's mission and purpose statements

The TU's 10-year mission is to be a university of 20,000 students, renowned for its teaching excellence and the distinctive qualities of its graduates.

The TU's purpose is to educate the youth of the world to take their productive place as
leaders in the global community.

The concrete indicators in TU's Mission Statement are substantiated by two existing Taylor's
policies:
Taylor's Graduate Capabilities
This policy substantiates the following clause in our Mission Statement:
"….. the distinctive qualities of its graduates"
Taylor's University Teaching and Learning Framework
This policy substantiates the following clause in our Mission Statement
"…. Renowned for its teaching excellence"

The diagram In Appendix 1 illustrates how the Taylor's Graduate Capabilities and Teaching and Learning Framework both support our Mission Statement, which in turn supports our Purpose. All academic and research policies and procedures at Taylor's are to be in accordance with the focus provided by these policies.

Purpose
Mission
Graduate Capabilities Teaching and Learning Framework

Taylor's Graduate Capabilities

The teaching and learning approach at Taylor's University is focused on developing the Taylor's Graduate Capabilities in its students, capabilities that encompass the knowledge, cognitive capabilities and soft skills of our graduates.

A Taylor's graduate has proven ability and is capable in the following areas

Discipline-specific knowledge
Sound understanding of foundational concepts and theories in subject area
Cognitive capabilities
Foundation and skills for lifelong learning
Learns autonomously
Able to acquire and manage information'
Ability to comprehend a wide variety of literature
Awareness of contemporary global issues
Problem solving skills
Defines issues of problems well
Analyses problems comprehensively
Allies knowledge effectively and applies theory to practice
Able to arrive at workable and effective solutions
Soft Skills
Communication skills:
Ability to speak and write well
Able to organize, synthesize and present information effectively
Interpersonal skills
Understands team dynamics, power of teams and team work
Works with others in a team
Able to assume leadership in small and/or big groups
Intrapersonal skills
Ability to manage time effectively
Understands the role of personal image and professionalism at work
Works independently in context of tasks to be completed
Cosmopolitan thinking and intercultural competence

Forms opinions and articulates views from a global perspective
Awareness of and sensitivity to cross-cultural differences
Technology savvy
Executive keyboarding
Effective use of ICT and related technologies

The learning environment at Taylor's is further geared towards nurturing the Taylor's Core Values; the personal attributes of excellence, integrity, passion for work, interpersonal respect and care, openness in communication and a healthy balance between professional and personal life.

Through participation in various optional electives, including co-curricular activities, Taylor's students may also develop additional knowledge, cognitive capabilities and soft skills other than those listed. These, as well as the Taylor's graduate capabilities above, are recorded by students in the form of individual student portfolios and verified by Taylor's University against the set of expectations for each subject, program and co-curricular activity.

Statutory Requirements:

Degree qualifications offered by Malaysian private higher education institutions are required by the government to comply with the internationally benchmarked points of reference below, for the purpose of quality control. Summaries of each of the instruments' relevant requirements, contextualized for TU, are given in the Appendices to this document.

Malaysian Qualifications Framework, MQF.
Code of Practice for Programme Accreditation, COPPA.
Code of Practice for Institutional Audit, COPIA.
Requirements of Professional Bodies, where applicable.

International Standards:

For the purpose of international benchmarking, we integrate best practices in quality

assurance in higher education from the regions from which Taylor's partner universities are drawn.

To implement the policy of compliance with the benchmark documents identified in this
section, collating the information from all sources the scope of the TQM is categorized into 10
distinctive areas.

Scope: Identified from

Overview and goals: MQF, COPPA, European Standard
Curriculum: MQF, COPPA, COPIA, professional bodies requirements; European, Australian and US Standards
Intake: COPPA
Assessment: COPPA, European and Australian Standards
Faculty: COPPA, European, Australian and US Standards
Resources: COPPA, European, Australian and US Standards
Review: COPPA, COPIA, European, Australian and US Standards
Public Transparency: European Standard
External QA mechanisms: COPPA, COPIA, professional bodies requirements; European, Australian and US Standards
Improved mechanisms: COPPA, professional bodies requirements; European, Australian and US Standards

Appendices:

Appendix No: Appendix Title
1 Summary of MQF requirements contextualized for TQM
2 Summary of COPPA requirements contextualized for TQM
3 Summary of COPIA requirements contextualized for TQM
4 Regulated professions in Malaysia

Part E: Regulations

Approved to University Regulations and Procedures.