UWE Bristol | University of the West of England

PROGRAMME SPECIFICATION

Part 1: Basic Data	
Awarding Institution	UWE
Teaching Institution	UWE
Delivery Location	UWE
Faculty responsible for programme	Faculty of Environment and Technology
Department responsible for programme	Department of Computer Science and Creative Technologies
Modular Scheme Title	IS Undergraduate Programmes
Professional Statutory or Regulatory Body Links	e-skills UK Accredited (WILL BE Sept 2014-Sept 2019)
Highest Award Title	BSc (Hons) Software Engineering for Business
Default Award Title	
Fall-back Award Title	BSc(Hons) Information Systems Studies
Interim Award Titles	BSc Software Engineering for Business Dip HE Software Engineering for Business Cert HE Software Engineering for Business
UWE Progression Route	
Mode(s) of Delivery	FT / SW
Codes	**UCAS: 6F3B** **JACS:** **ISIS2:** **HESA:**
Relevant QAA Subject Benchmark Statements	Computing and Business and Management
First CAP Approval Date	February 2014 Valid from September 2014
Revision CAP Approval Date	29 May 2018 Revised with effect from September 2018
Version	2

Part 2: Educational Aims of the Programme

Central and crucial to the SEfB programme will be an emphasis on partnership, student centred engagement and an appropriate balance of education, training and practice-based experience. Employers actively supporting the programmes include BT, CA Technologies, The Cabinet Office, Capgemini, CGI (was Logica), Cisco, Enternships, General Dynamics, IBM, Kinetic, Ministry of Justice, MOD, NHS Wales and TCS (Tata Consultancy Services). UWE has developed close links with a number of the members of the e-skills UK employers strategy forum e.g. IBM, Capgemini, GSK, and Credit Suisse, who regularly provide placements and internships for our students and who have employed a good number of our graduates.

All partner universities create their own version of a balanced curriculum that engages students in various learning and practical activities. Consistency across all programmes is achieved through an interaction of aims/objectives, assessment techniques, teaching methods and content approved by both the partner

STUDENT AND ACADEMIC SERVICES

Part 2: Educational Aims of the Programme

employers and the university. Partner universities are expected to design a curriculum that meets all of the requirements of the Learning Outcomes Skills Requirement (LOSR) document and proof of this is a requirement for endorsement.

An employer-led design team, informed by wider employer consultation, has worked in partnership with curriculum experts from partner universities (including UWE) to define the learning outcomes of most value to the sector. Strategies for sustainability and for employer involvement have been designed in, informed by our collective experience of ITMB, including 'guru' lectures, awards, project challenges and business placements for students.

UWE has been a member of the e-skills Programme Development Group since the start of the design process. The goal was to produce the blueprint for a programme which sets high standards re:

- Relevance of content
- Effective employer engagement
- Attracting the highest quality students
- Appeal to women as well as men
- Degree completion rates
- Progression into IT careers

The specific educational aims of the programme are to:

1. provide students with a broad background understanding of business operations, procedures and culture, as applicable to a career in an IT environment;
2. enable students to recognise the nature, role and importance of information systems within business organisations and the importance of information security;
3. develop students' knowledge and practical skills to select and employ appropriate technologies, tools, techniques and methods for understanding and developing information systems in business contexts;
4. develop deep technical competence in the software development process as applied in business;
5. equip students to play a key role in software project management;
6. develop both personal and inter-personal skills to enable the students to work closely and communicate with others in all aspects of the software development process;
7. provide students with a set of problem-solving and modelling skills appropriate to IT related business systems development and operations;
8. enable the students to play a central role in an IT project; and gain business experience in a project oriented environment;
9. develop the students' critical, evaluative team working and problem-solving abilities that will be valuable to them in any career;
10. continue the development of those general study skills that will enable students to become independent, lifelong learners including career and employability awareness

Programme requirements for the purposes of the Higher Education Achievement Record (HEAR)

Employer-designed and backed and e-skills UK endorsed, this programme provides graduates with the mix of skills and capabilities required by UK business for the specification, design and delivery of ICT systems, services and solutions in a range of business contexts and application domains.

It develops technically competent individuals who think and communicate effectively and who can conduct inquiry, solve problems, undertake critical analysis and deliver effective software systems solutions in a constantly changing business context.

It provides a solid foundation for lifelong learning, emphasising the development of knowledge, skills and professional values essential to the practice of systems development.

Part 3: Learning Outcomes of the Programme

The award route provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

A. Knowledge and Understanding (subject specific)

1. **IT in Business**
   Students will be able to assess the contribution and impact of technology in the global business environment; demonstrate an understanding of basic business functions and organisational structures in different sectors (including an international dimension) and possess a sound understanding of contemporary working practices. Students will understand why a business case is needed and be able to create a business case for a technology-enabled business solution, including an assessment of business benefits, impacts, risks and return on investment and design a small-scale system suitable for business use, adopting open-source software, operating systems, development tools and materials as appropriate.

2. **Custom Software Development Essentials**
   Students will understand software development processes that support the design and construction of software products, including the transformation of a design into an implementation, the tools used during this process, formal software construction methods and designing for maintainability; Students will understand software design and development methodology (e.g., structured or object-oriented), be able to apply appropriate industry standard design notation, select, with justification, an appropriate set of tools to support the development of software products; explain the potential benefits and drawbacks of using formal specification languages and understand the software development process as aligned to industry practice.

3. **Data and Algorithms**
   Students will be able to write programs that use a wide range of data types and data structures; use pseudo code and an appropriate programming language to implement, test, and debug algorithms for solving problems; confidently design and apply algorithms for manipulating data in programming solutions for a variety of computational problems and understand search techniques and memory management.

4. **Software Modelling & Analysis**
   Students will understand the role and purpose of modelling and the distinction between analysis and design models; Students will be able to apply a wide variety of industry standard modelling techniques, analyse the problem domain to establish a basis for the creation of a software design and describe what the customer requires through solution design modelling.

5. **Software Architecture**
   Students will understand the differences between multi tiered (1/2/3) architectures and layers and their merits, be able to formulate a system according to a multi-tier architecture, so that the presentation, the application processing and the data management can be separated into different logical processes and understand concepts such as separation of concerns, loose coupling and cohesion. Students will understand the role of software architecture in software design.

6. **Software Requirements Management**
   Students will understand the requirements development process: elicitation, specification, analysis, and management and the use of tools for managing requirements, and how requirements, design, implementation and verification are linked together to control development and ensure quality;

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Part 3: Learning Outcomes of the Programme

Students will be able to elicit and negotiate requirements using a variety of techniques, be competent in writing clear and concise functional and non-functional requirements, organize and prioritize and validate requirements according to criteria such as feasibility, clarity, testability and freedom from ambiguity.

7. **Software Design**

Students will be able to discuss the properties of good software design including the nature and the role of associated documentation, appreciating that design increasingly covers use of existing code and 3rd party elements, select and apply appropriate design patterns in the construction of software, understand the different contexts for HCI (mobile devices, consumer devices, business applications, web, business applications, collaboration systems, games, etc.) and be able to define a user-centred design that explicitly recognises the user and is DDA compliant (Disability Discrimination Act), create and specify a software design for a medium-size software product using a software requirement specification, an accepted program design methodology (e.g., structured or object-oriented), and appropriate design notation.

8. **Software Verification and Testing**

Students will be able to describe in detail the purpose of, and distinguish between the different types and levels of verification (analysis, demonstration, test, formal proof, inspection etc.) and testing (unit, integration, systems, and acceptance) including the role and value of test driven development techniques, analyse requirements to determine appropriate testing strategies, create, evaluate, and implement a test plan, develop and execute accurate and clear test scripts, be competent in developing automated tests within the build phase for applications at a transaction and method level.

9. **Software Development Process**

Students will be able to understand the importance of a software process for governing software development both technically, and in terms of cost control, quality, adherence of technical strategy and IPR identification. They will understand the software life cycle, its phases and deliverables, and have a critical awareness of both predictive and adaptive methods and approaches so as to be able to select, with justification software development models and process elements most appropriate for the development and maintenance of a diverse range of software products. Students will have an understanding of distributed development work (e.g. onshore, near shore and offshore) and understand the processes, benefits and drawbacks of each.

10. **Software Development in Context**

Students will understand the fundamental components of technology solutions in a range of typical modern business environments and explain their interactions for applicable target systems – e.g. games console, smart-phone, embedded system understanding the differences that these environments bring. Students will understand the contexts of real time and embedded systems development as well as component software within hardware systems and be able to demonstrate the capability to justify, select, and apply an appropriate set of tools to support the development of a range of software products and to specify and implement user interfaces for a range of different contexts.

11. **Software Configuration and Release Management**

Students will be able to define configuration management processes for use throughout the product development life cycle in storing software deliverables and controlling and tracking changes to software both at component and release level; modify software designs and deliverables following sound change control approaches and change control tools; understand the importance of version control, select and apply configuration management and change control tools for use within software development projects, and be able to apply them.

Part 3: Learning Outcomes of the Programme

12. Software Deployment
Students will understand the organisational context into which software is deployed and the human and business issues associated with deployment, recognise the challenges of deploying software releases which form part of a software or hardware system, perhaps with other software elements from a 3rd party, and embedded systems, Be able to interact to agree dependencies on interfaces, processing speed, resource utilisation and staged deployment in to maturing prototypes and systems, develop and apply user documentation and training materials as part of software development and deployment activities and design and develop training materials and plan end user training following software deployment.

13. Software Maintenance
Students will understand the impact of developing software for systems which need to be maintained for extended operational periods and be aware of the importance of documentation rigour in those circumstances, read and Analyse existing software behaviour in order to improve its efficiency, reliability, and maintainability, maintain and update software as required to ensure continued effectiveness and in response to external factors and understand the role and purpose of refactoring in improving programming solutions efficiency, scalability, maintainability and extensibility.

14. Legacy Systems
Students will have an understanding of legacy architectures and technologies (e.g. mainframe/COBOL etc) and be equipped to identify, review and understand legacy system documentation, source code and system data architectures distributed across files with incompatible structures. Students will understand the reasons for, and risks associated with, replacing or keeping and maintaining legacy systems.

15. Software Quality
Students will be able to specify, design and build high-quality software components, understanding the differences and interactions between safety and quality, compare and contrast quality methods and techniques and be aware of industry standard static and dynamic code analysis frameworks.

16. Data Modelling, Database Development and Data Analysis
Students will understand the basic principles of the relational data model and the issues of scale and management of large data or big data; be competent at developing a range of industry standard database models; Students will be able to: create a relational database schema that incorporates key, entity integrity, and referential integrity constraints; implement a database-driven web site, explaining the relevant technologies involved in each tier of the architecture and the accompanying performance tradeoffs; write stored procedure queries; understand the role of data mining, the algorithms developed to address different data mining goals and the application of these algorithms to real-world problems including big data.

17. Risk & Information Security
Students will understand the nature of risk to information and information systems; be able to define what cyber security is, and explain its importance when developing software solutions and mitigating risk; appreciate the importance of determining and managing risk for threats and vulnerabilities to information systems on an ongoing basis; understand human aspects of information security including client data protection and the data protection act; understand how to make software more resilient to threats.

18. Software Project Management
Students will be able to: interpret and use standards in software project management, including PRINCE2; prepare a project plan for a software project

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that includes estimates of size and effort, a schedule, resource allocation, configuration control, change management, and project risk identification and management; be able to identify the range of software development resources required and allocate them to a project and demonstrate through involvement in a team project the central elements of team building and team management during software development; manage project progress, productivity and other aspects of software development processes, against plan; apply the concepts of earned value management to IT projects and programs; identify risks to a software project and indicate an approach to managing risk that will help to secure the on-time on-budget on-quality delivery of software; document project progress recording risks, actions, issues and decisions.

19. Professional Practice

Students will: understand the principles of leadership and be able to work effectively as a member or lead of a small development team and adopt best practices for developing software in teams, recognising challenges and approaches taken to resolve them; understand the challenges of working in a distributed team, and mechanisms to address the challenges; be able to make concise, engaging and well-structured verbal presentations, arguments and explanations, to a range of audiences about technical problems and their solutions, taking into account the audience viewpoint at all times; understand the wide variety of IT professional and managerial roles that exist and understand the role and membership benefits of professional bodies in promoting IT professionalism.

20. Innovation

Students will: understand technology innovation, including disruptive technologies and be able to describe current and past examples (e.g., cloud, apps, the hard disk drive, text messaging, GPS, the smart phone, Linux, Social networking); be equipped to explore and describe how businesses innovate through technology, considering a range of organisations in different sectors; be able to assist in the assessment of the commercial viability of new technology based ideas and in transforming research based ideas into feasibility and business plans.

B. Intellectual Skills (generic)

1. Critical Thinking
2. Analysis
3. Synthesis of different types of information
4. Evaluation
5. Problem Solving
6. Appreciate problem contexts
7. Balance conflicting objectives

Intellectual skills are developed by exploring the issues surrounding the application of information systems in business contexts. Because 'context' is understood as fundamental, and not as an outer layer on a technical core, these cognitive skills tend to be developed in parallel, rather than sequentially. Thus, element 6 is developed alongside elements 5 and 2; element 7 is developed alongside element 3; and elements 1 and 4 are inculcated from the beginning.

Element 6 is particularly salient in IS, where 'problem context' is understood broadly, to include organisational and social settings, as well as a historical perspective. This produces a concomitant breadth in elements 3 and 5, because problems are viewed as sociotechnical (and situated) rather than technical (and abstract), and relevant information sources are correspondingly expanded. The award has a strong focus on the *usability* and *accessibility* of

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information systems, so that element 7 has to address the spread and diversity of requirements and objectives present in the user community.
This concurrence of intellectual skills is foremost developed in the Information Practitioner modules in which the contexts at each level demand growing opportunities to develop and reflect on these skills through case studies (Level 1), university clients (level 2), and external clients (level 3).

C. Subject/Professional/Practical Skills (subject specific)

The high level degree competency outcomes are:

1. **Show competence in software development processes, including the knowledge, skills, and professional competences necessary to begin practice as a software engineer in a business environment.**
   Students, through learning, regular reinforcement and practice, and exposure to real world software development paradigms need to gain confidence in their ability to perform software development practice. Through a structured program of study, the knowledge, understanding and skills are acquired through a staged approach with increasing levels of competence being achieved as the degree progresses. Graduates need to develop an understanding and appreciation of professional issues in software development related to ethics and professional conduct, economics, and the needs of employers.

2. **Be able to confidently work as an individual and as part of a team to develop and deliver quality software deliverables.**
   Students need to develop the ability to perform software development tasks that involve work both as an individual and also working in a team. Developing an appreciation and experience of effective team working is essential to operating effectively in a business environment. The degree programme must include an emphasis on the importance of team working as a disciplined approach, the need to adhere to deadlines, communication, and team as well as individual performance evaluation.

3. **Design appropriate solutions in a range of application contexts/domains using software development approaches that deliver business value.**
   Students need to be exposed to a variety of software design contexts, including desktop applications, internet and mobile device software and apps. They need to understand and develop appropriate approaches to software design in the general sense, and to problem solving for specific application domains. They need to be able to understand the strengths and the weaknesses of the various options available and the implications of the selection of appropriate approaches for a given context. They must develop competence in designing solutions within business constraints of time, cost and quality as well as addressing security. Having a thorough understanding of software requirements (including non-functional requirements), how to interpret and prioritise requirements is essential.

4. **Build and test software solutions for a range of application contexts/domains.**
   Students need to be able to apply software development to a wide range of contexts and environments. These include operating systems, internet and fixed platforms, apps, games, business solutions etc. They need to be able to understand how to transfer development principles to new and different technologies. They need to be able to assure the functionality of their solutions through testing and embed secure development principles to all stages of development. Students also need to understand that a significant amount of software development work, involves updating, maintaining and refactoring existing solutions. They need to develop and demonstrate confidence in reading and reviewing existing software and the need to increase efficiency through refactoring.

5. **Reconcile conflicting project objectives, finding acceptable compromises recognising the limitations of capability, capacity, cost, and time.**

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Students will develop a professional approach to managing their contribution to project deliverables. In the business environment they will need to understand how to estimate activities and balance meeting the specification, but delivering on time and to the right quality level. Students need to understand how to approach conflicting demands and engage in exercises that expose them to conflicting and changing requirements. There will be a strong real world emphasis in the study. Students will appreciate when to question deliverables – e.g. is an activity to fix an error (bug) to achieve the stated quality, or is it an enhancement request that needs to be considered as an additional requirement with impact assessment, planning, resourcing and costing decisions to be made on if and when to consider the additional request. The degree programme will address these issues, with the aim of ensuring high quality requirements and a feasible software design.

6. **Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for problem identification and analysis, software design, development, implementation, verification, and documentation.**
The presence of the Capstone project, an important final activity at the end of a software development program of study, is of considerable importance in this regard. It offers students the opportunity to tackle a major project and demonstrate their ability to bring together topics from a variety of courses and apply them effectively. This mechanism allows students to demonstrate their appreciation of the broad range of software development topics and their ability to apply their skills to genuine effect. This will also include the ability to offer reflections on their achievements.

7. **Demonstrate an understanding and appreciation for the importance of negotiation, effective work habits, leadership, and good communication with stakeholders in a typical software development business environment.**
It is important that students gain an insight and understanding of range of professional interpersonal skills required to be effective in business when producing a solution for a problem domain (requirements, design, solution development etc). Software engineers must recognise that effective software development is achieved as a result of a dynamic and interactive team based approach. Employer visits, guest lectures from practicing software engineers etc will aid students in better comprehending the business team environment, and the importance of professionalism.

8. **Learn new models, techniques, and technologies as they emerge and appreciate the necessity of such continuing professional development.**
On graduating, students will clearly demonstrate that they are self-motivated life-long learners. They will understand the continuous nature of emerging technologies, and how and when is best to harness and exploit their benefits for business gain. Students will be capable of identifying, selecting and applying new technologies, tools and methods and be able to assess their contribution to software development. The final year project allows students to apply critical thinking and use context driven software development to plan and complete a significant project (not simply a software deliverable).

9. **Embedding security in the software development life cycle.**
Security has become a widespread and significant issue in the development and ongoing safeguarding of software systems. Students will have a robust understanding of software security issues, and the principle models of security in relation to information systems. They will understand the nature of risk, threats and vulnerabilities and be able to incorporate preventative measures into software design. They will be aware of current approaches to safeguarding the systems that they are involved in developing, including security testing. Throughout the degree they will be thinking about security implications and adopt secure architecture, design and development practices.

D. Transferable Skills and other attributes (generic)

1**. Communication skills: to communicate orally or in writing, including, for instance, the results of technical investigations, to peers and/or to**

Part 3: Learning Outcomes of the Programme

"problem owners".
 developed through a variety of methods and strategies including the following:
- participation in tutorials and other discussion forums
- negotiation of work plans and requirements with team members and clients
- presentation of work to peers, staff, and clients
- writing essays, reports, and examination answers
- Students participate in electronic conferences, workshops, and group work sessions.

2. Self-management skills: to manage one's own time; to meet deadlines; to work with others having gained insights into the problems of team based systems development.
 developed through a variety of methods and strategies including the following:
- self-managed practical work
- effective participation in tutorial and laboratory sessions
- methodical execution of analysis and design tasks
- synchronising with others in team work
- scheduling assignment work and revision
- scheduling and attending meetings with clients

3. IT Skills in Context (to use software in the context of problem-solving investigations, and to interpret findings)
 developed widely throughout the programme including:
- use of range of system development tools, methods and packages
- regular involvement in systems analysis and design activity
- cumulative mastery of tools and methods
- use of online teaching materials
- sustained use of the Internet
- emphasis on user-centred and accessible systems design work
- building systems to a user-focused specification

4. Problem formulation: To investigate and express problems in appropriate forms.
 developed through a variety of methods and strategies including the following:
- Students develop problem solving systems
- Students practice systems design and development using a variety of tools and methods

5. 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
 developed through a variety of methods and strategies including the following:
- Students are encouraged to research relevant topics in order to complete tutorial task and project based work

Part 3: Learning Outcomes of the Programme

- Students are encouraged to use online facilities to discover information

6. Comprehension of professional literature: to read and to use literature sources appropriate to the discipline to support learning activities.
   developed through a variety of methods and strategies including the following:
   - Students are encouraged to access online material

7. Working with Others: to be able to work as a member of a team; to be aware of the benefits and problems which teamwork can bring.
   developed through a variety of methods and strategies including the group work undertaken in The Information Practitioner modules.

All of the skills are demonstrated in varying degrees in all assessments with the exception of teamwork, which is required in important elements of the coursework, and IT skills, needed for most of the coursework. It would be impossible to progress to completion on the award without demonstrating a basic competence in all of these skills. These skills are demonstrated in a variety of contexts including
   - examination
   - poster presentations.
   - individual and group projects
   - Practical assignments
   - Portfolio of exercises

Learning Outcomes:	Module No: UFCF83-30-1	Module No: UFCFC3-30-1	Module No: UFCFA3-30-1	Module No: UFCF9F-30-1	Module No: UFCFN6-30-2	Module No: UFCFV4-30-2	Module No: UFCFB6-30-2	Module No: UFCFW4-30-2	Module No: UFCFE6-15-3	Module No: UFCFP6-30-3	Module No: UFCFB5-15-3	Module No: UFCFFF-30-3	Module No: UFCFAF-30-3	
A) Knowledge and understanding of:														
A1	X				X	X			X	X	X			
A 2		X	X	X	X		X	X		X			X	
A 3		X	X			X		X						
A 4		X		X		X	X			X				
A 5		X				X	X						X	
A 6	X		X	X	X		X			X		X		

Part 3: Learning Outcomes of the Programme

Learning Outcomes:	UFCF83-30-1	UFCFC3-30-1	UFCFA3-30-1	UFCF9F-30-1	UFCFN6-30-2	UFCFV4-30-2	UFCFB6-30-2	UFCFW4-30-2	UFCFE6-15-3	UFCFP6-30-3	UFCFB5-15-3	UFCFFF-30-3	UFCFAF-30-3
A 7		X		X	X	X				X		X	X
A 8												X	X
A 9				X					X	X	X	X	X
A 10				X		X							
A 11													
A 12					X					X			
A 13					X					X			
A 14				X	X					X			
A 15													X
A 16				X		X		X					
A 17										X			X
A 18					X					X			X
A 19	X				X				X	X	X		
A 20										X			

B) Intellectual Skills

Learning Outcomes:	UFCF83-30-1	UFCFC3-30-1	UFCFA3-30-1	UFCF9F-30-1	UFCFN6-30-2	UFCFV4-30-2	UFCFB6-30-2	UFCFW4-30-2	UFCFE6-15-3	UFCFP6-30-3	UFCFB5-15-3	UFCFFF-30-3	UFCFAF-30-3
B1	X				X				X	X	X	X	
B2	X	X		X	X	X	X	X	X	X		X	X
B3	X	X	X	X	X	X	X	X	X	X	X	X	X
B4	X			X	X				X	X		X	
B5	X	X		X	X	X	X	X	X	X		X	X
B6			X	X	X				X	X	X	X	X
B7					X				X	X	X	X	

Part 3: Learning Outcomes of the Programme

C) Subject/ Professional/ Practical Skills

	UFCF83-30-1	UFCFC3-30-1	UFCFA3-30-1	UFCF9F-30-1	UFCFN6-30-2	UFCFV4-30-2	UFCFB6-30-2	UFCFW4-30-2	UFCFE6-15-3	UFCFP6-30-3	UFCFB5-15-3	UFCFFF-30-3	UFCFAF-30-3	
C1	X	X	X	X	X	X	X	X	X	X	X	X	X	
C2	X				X	X				X	X			
C3	X			X	X	X				X		X	X	
C4					X					X			X	
C5					X					X			X	
C6	X	X	X	X	X	X	X	X	X	X	X	X	X	
C7	X				X					X		X		
C8	X				X					X	X	X		
C9				X						X		X		

Learning Outcomes:

D) Transferable skills and other attributes

	Module No: UFCF83-30-1	Module No: UFCFC3-30-1	Module No: UFCFA3-30-1	Module No: UFCF9F-30-1	Module No: UFCFN6-30-2	Module No: UFCFV4-30-2	Module No: UFCFB6-30-2	Module No: UFCFW4-30-2	Module No: UFCFE6-15-3	Module No: UFCFP6-30-3	Module No: UFCFB5-15-3	Module No: UFCFFF-30-3	Module No: UFCFAF-30-3	
D1	X			X	X					X	X	X	X	
D2	X	X	X	X	X	X	X	X	X	X	X	X	X	
D3	X			X	X	X				X	X	X		X
D4	X	X	X	X	X	X	X	X	X	X	X	X	X	
D5	X	X	X	X	X	X	X	X	X	X	X	X	X	
D6	X			X	X						X	X	X	
D7	X				X	X			X	X				

Part 4: Student Learning and Student Support

Teaching and learning strategies to enable learning outcomes to be achieved and demonstrated

At UWE, Bristol there is a policy for a minimum average requirement of 12 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 are embedded within the programme which, together with the contact time, enable learning outcomes to be achieved and demonstrated.

On the Software Engineering for Business programme teaching is a mix of scheduled, independent and placement learning.

Central to the Faculty's developing Teaching and Learning Strategy is the intention to:
- create a community of learners, where staff and students work, learn and interact together to forward their own and each other's learning
- promote deep approaches to learning and lifelong learning
- create learning experiences that produce graduates with the ability to think critically and analytically and to take responsibility for the management of their own learning.
- provide support for a diverse body of learners

These principles inform the curriculum design and underpin the wide range of teaching, learning and assessment approaches that have been adopted. The strategy emphasises the value of variety in stimulating students and responding to their different preferred learning styles. Teaching teams are expected to be reflective about how chosen methods contribute to meeting the aims of the strategy. External examiners' comments confirm that this is generally well achieved.

Scheduled learning includes lectures, seminars, tutorials, project supervision, demonstration, practical classes and workshops, external visits and work based learning.

Independent learning includes hours engaged with essential reading, case study preparation, assignment preparation and completion etc.

Placement learning: will normally include a practice based Level3 module.

Web Conferencing A notable distinguishing feature of the e-skills UK endorsed programmes is the Inspirational Guru lecture series. The Guru lectures are delivered both in person and remotely (electronically in real-time to allow student interaction). CSCT has developed appropriate facilities for web conferencing (an interactive video link). A Guru Lecture schedule is published by e-skills UK on an annual basis in July for the following academic year. This provides dates, topics and likely Gurus and enables the content of the Guru Lectures to be assimilated into the teaching and learning of appropriate modules.

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 and group project work.

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 University divides responsibilities for pastoral care between academic personal tutors who look after the academic well-being of students and Student Advisors who provide comprehensive, full-time student support on a range of issues including funding, academic regulations, personal and health issues. The service operates on a drop-in basis or by appointment.

Part 4: Student Learning and Student Support

Peer Assisted Learning (PAL). The operates a Peer Assisted Learning Scheme in which L2 students are recruited and paid to provide peer support to first year students on selected modules.

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 at all sites 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.

Students are encouraged to explore and make use of Library databases such as IEEE Xplore and Business Source Premier, in addition to the rich resources available at Study Skills and lynda.com, as well as espresso maths and espresso programming.

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.

Computing Facilities The Faculty offers specialised computing facilities and user support alongside the general University provisions. Their nature and extent changes from time to time, as hardware and software provision is updated to follow technological change and as availability of resources permits.

Wireless Connectivity is available throughout the University including the library. This enables students to work in small groups in a variety of formal and informal spaces while also being able to access library catalogues, UWEonline, the University's Virtual Learning Environment (VLE) and the internet.

Description of any Distinctive Features

e-skills UK Employer's Strategy Forum is responsible for setting the overall strategy for the SEfB programme and is committed to maintaining its quality and its relevance to their respective industries. It also plays a key role in the delivery of the programme, by providing hands-on support to SEfB lecturers and students. In this way it helps SEfB students to develop the knowledge and the skills required to enable them to secure management careers in the IT world - particularly within its own member companies. The high level of employer involvement helps to confirm and consolidate the relevance and importance of the topics and subjects covered by the award, to broaden the context of study for the students through exposure to contemporary applications, initiatives and issues and to inspire them to see their education as a powerful force in their personal and professional development.

The support of such a large number of e-skills UK Employer's Strategy Forum member companies has proved both valuable to and popular with ITMB students. As with the ITMB programme, employer involvement will take a number of forms including:
- delivering GURU lectures
- the sponsoring of both inter and intra student competitions
- the hosting of 'all student away day events'
- mock selection centres/interviews

Employer 'know-how' is very much key to the undergraduates' experience throughout the SEfB course and the e-skills invited 'Guru Lecture' series is a key element in bridging the academic and business worlds. There will be approximately 12 Guru Lectures throughout the academic year and undergraduates on the SEfB Degree course are strongly encouraged to attend all of them. Lectures are hosted (in turn) by one of the participating universities and broadcast live to the others using web conferencing software. They are intended to inspire and motivate the students and to support their studies by showing the importance of theory to the world of practice. Speakers and topics are arranged in negotiation with the participating universities and span technology, business, project management and personal/interpersonal skills.

Part 4: Student Learning and Student Support

Some extra sessions will run specifically for the benefit of second-year students, with the focus on employability, representatives from members of the e-skills UK employer community will run a series of workshops here at UWE at which they can tell students about their approach to graduate training and career development and about placement opportunities and internships. Recent graduates will attend (and in some cases, lead) these sessions in order to provide students with an insight into the nature of their employer's graduate development scheme and to tell students what their day-to-day working life is like.

Twice each year, SEfB students will have the opportunity to practice their skills in front of executives from the e-skills partner companies at e-skills organised regional 'All Student Events'. At these events students from the various universities offering the award will take part in a variety of inter-university first-year competitions, get help and advice from representatives of up to 50 different employers and listen to a number of keynote speakers. An important part of the event will be an inter-university competition in which student teams present and defend their views on an employer defined 'business challenge'.

Participation in these competitions will help students to develop personal and interpersonal and project management core skills as well as enhancing their knowledge and understanding of emerging areas of importance. It will also help to instil a strong sense of self-worth in both the participating students and the wider cohort, and help students to understand that academic achievement is only one part of the skills mix required for success in life.

BSc SEfB students will be offered one or more 'Mock Interview' days held at the head office of one of the SEfB partner companies. These days are run just as a professional interview/selection day would be, with the additional benefit of feedback and advice from members of the e-skills UK Employer's Forum.

Part 5: Assessment

A: Approved to University Regulations and Procedures

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

The approach to assessment has been guided by the QAA Code of Practice for the assurance of academic quality and standards in Higher Education (2006) (Section 6: Assessment of students) and UWE University Assessment Guidelines.

Students will be bound by the general assessment regulations of the University. The University regulations provide a framework for the assessment of students' competence, knowledge and understanding, and the grading of students for progression and the conferring of awards. It allows, and expects, staff to give feedback to students and to evaluate the effectiveness of their own teaching.

Assessment is part of the process of helping students to learn and is intended to support them in developing knowledge and understanding as set out in sections three and four of this document. In addition, assessment aids the development of a range of cognitive and intellectual skills, and techniques. Forms of assessment are varied and include exams, essays, group and individual projects, presentations, reflective writing and practical work.

The process of reflection is explicit in many assessments and implicit in them all; alongside feedback from assessments, it is integral to the development of independent learning and student skills of self-assessment. Additionally, feedback is an important means of motivating students to further learning. Assessment is also an important vehicle for the development of a range of transferable skills.

Moderation and verification of assessments at a programme level provides information on overall levels of attainment and ensures that standards are maintained, and is a useful indicator of any areas where extra scrutiny may be needed.

The procedures of assessment involve a number of mechanisms to ensure validity and reliability. These

Part 5: Assessment

include the moderation of all assessments and their marking schemes and assessment criteria, by a peer and by the External Examiner.

As they progress, students are increasingly expected to undertake independent study and research activities, in particular when completing the Practice and Project elements of the course. The Project will be facilitated by a traditional summative assessment approach at the culmination of the work, however, there will be extensive use of formative feedback, milestones, and guidance from staff during the project (and other, independent-study and research-based assessment undertaken by students); the practice based modules are assessed iteratively, by portfolio.

Students will receive feedback, particularly during the practical and self-study elements of the programme to ensure they can keep track of their progress and development. This will also be a key factor in ensuring student engagement and retention on the programme of study. Where possible and practical, verbal, face-to-face feedback will be the preferred method of delivery; this is particularly appropriate where students are expected to present and defend their work.

Part 6: Programme Structure

This structure diagram demonstrates the student journey from Entry through to Graduation for a typical **full time student**, including: level and credit requirements; interim award requirements module diet, including compulsory and optional modules

ENTRY		Compulsory Modules	Optional Modules	Interim Awards
	Year 1	For 2018/19: UFCF83-30-1 The information Practitioner 1 From 2019/20: UFCF83-30-1 IT Practice: Skills, Models and Methods UFCFC3-30-1 Introduction to OO Systems Development UFCFA3-30-1 Principles of Computing UFCF9F-30-1 Information Systems Development	None	Interim Awards Certificate of Higher Education in Software Engineering for Business (120 credits, of which not less than 100 are at Level 1 or above)
	Year 2	For 2018/19 and 2019/20: The Information Practitioner 2 UFCFN6-30-2 From 2020/21: IT Practice: Collaborative Project UFCFN6-30-2 UFCFV4-30-2 Data Schemes and Applications UFCFB6-30-2 Object-Oriented Systems Development UFCFW4-30-2 Design and Analysis of Data Structures and Algorithms	None	Interim Awards Diploma of Higher Education in Software Engineering for Business (240 credits, of which not less than 100 are at Level 2 or above and a further 120 are at Level 1 or above.)

Year Out: UFCFE6-15-3: Professional Experience: Students who choose not to take a placement year, and therefore do not take UFCFE6-15, must take one of the 15 credit option modules listed below.

		Compulsory Modules	Optional Modules	Interim Awards
	Year 3	For 2018/19, 2019/20 and 2020/21: UFCFP6-30-3 The Information Practitioner 3 From 2021/22: IT Practice: Consultancy Project UFCFB5-15-3 Ethical and Professional Issues in Computing and Digital Media UFCFFF-30-3 Software Development Project	UFCFE6-15-3: Professional Experience OR UFCFWJ-15-3 International Experience OR UFCFVJ-15-3 Professional Development UFCF95-15-3 Entrepreneurial Skills UFCFA5-15-3 Information, Networks and	Interim Awards BSc Software Engineering for Business (300 credits with at least 60 credits at level 3, plus a further 100 credits at level 2 or above and a further 120 credits at level 1 or above) :

	UFCFAF-30-3 Development of Information Systems Projects	Society UFCFX3-15-3 Advanced Topics in Web Development UFCFU3-15-3 Advanced Databases	
		UFCFM6-15-3 Requirements Engineering UFCFD5-15-3 Technical Writing and Editing UFCFT4-15-3 Cryptography	

GRADUATION

Part time:
The following structure diagram demonstrates the student journey from Entry through to Graduation for a typical **part time student.**

There is no specifically timetabled part time route for this programme; students are free to gather modules as they wish, within the constraints of timetabling, availability, prerequisites and the prevailing UWE Regulations.

Part 7: Entry Requirements

The University's Standard Entry Requirements apply

Tariff points as appropriate for the year of entry - up to date requirements are available through the courses database.

Part 8: Reference Points and Benchmarks

Description of *how* the following reference points and benchmarks have been used in the design of the programme:

In designing this programme, the Faculty has drawn upon the following external reference points:

- QAA UK Quality Code for HE: National qualification framework
- QAA Subject benchmark statements for Computing and Business & Management
- UWE Bristol Strategy 2020
- E-skills UK Endorsement Document for the BSc Information Technology Management for Business
- UWE's Technology Enhanced Learning Strategy (2012-2017)

The QAA UK quality code for Higher Education Qualifications describes the attributes and skills expected of Honours graduates. It is our view that the learning outcomes of the programme are fully consistent with the qualification descriptor in the Framework, and hence that graduates are able to demonstrate that they meet the expectations of the Framework.

The curriculum for the programme draws on the QAA Subject Benchmark Statements for Computing and (to a lesser extent) those for Business & Management. The QAA Computing Benchmarking document recognizes that computing awards may be placed on a spectrum, with those covering a broad range of computing topics at one end, and those focusing on specialist areas, e.g. safety-critical systems, at the other. This award lies between the two extremes in that it provides a reasonably broad coverage of the main areas of Information Systems development applicable in the business context. The specified aims, objectives and philosophy lead to an award which conforms to the principles of course design in the

Part 8: Reference Points and Benchmarks

benchmark statement. The QAA Business & Management benchmark explicitly recognises the important role of the study of Information Systems in the context of business, and the design of the programme reflects this.

Through its constituent teaching and learning elements, assessment strategies, practical focus and learning outcomes, the programme intends to support the achievement of the workstreams defined in the UWE Bristol Strategy 2020. Specifically, the programme will contribute to the strategic ambitions of outstanding learning (Work-stream 1) and developing ready and able graduates (Work-stream 2).

UWE's Learning & Teaching Strategy has informed the Faculty's policy for the delivery of its programmes and this companion to an already well-established programme (ITMB) is proposed in the light of the recent CSCT curriculum refresh project. It also takes account of the policies and requirements set out in UWE's Technology Enhanced Learning Strategy and the current FET Teaching, Learning and Assessment Strategy. In particular, it seeks to maximise the efficiency of resource utilisation while promoting the achievement of high quality outcomes through, for example:

- The utilization of existing core modules from both the computer science and information science clusters (the programme contains one new module at L1 and two at L2)
- consolidation of the existing emphasis on partnership, student-centred engagement and an appropriate balance of education, training and practice-based experience;
- an increased focus on ethical and professional issues relating to computing and digital media.

The ethos, structure and content of the proposed programme has been very much shaped by the success of the ITMB programme, together with input from the e-skills employers strategy forum, feedback from employers of placement students and from graduates of both the ITMB and the BSc Business Information Systems.

The emphasis of the programme is to prepare students with a solid grounding in software engineering so as to enable them to take up a variety of technical positions in industry. The success of the approach been borne out by the wide variety of organisations in which ITMB students have been placed or employed and by the overwhelmingly positive feedback of their employers.

The development of the programme reflects UWE policies and is fully consistent with the University's commitment to 'make a positive difference to our students, business and society'.

UWE Bristol Strategy 2020, Outstanding Learning:

As previously stated, central and crucial to the SEfB programme will be an emphasis on partnership, student centred engagement and an appropriate balance of education, training and practice-based experience. As with the ITMB, this award is expected to set high standards with respect to:

- Relevance of content
- Effective employer engagement
- Attracting the highest quality students
- Appeal to women as well as men
- Degree completion rates
- Progression into IT careers

UWE Bristol Strategy 2020, Ready and able graduates:
As part of the program design and consultation exercise the following features of the BSc 'ITMB' were identified as areas of good practice. These are central to and have been built upon for the' SEfB programme.

- The high level of employer involvement helps to confirm and consolidate the relevance and importance of the topics and subjects covered by the award, to broaden the context of study for the students through exposure to contemporary applications, initiatives and issues and to inspire them

Part 8: Reference Points and Benchmarks

to see their education as a powerful force in their personal and professional development.

- e-skills UK organize an annual round of inter-university competitions. UWE's first year inter-university competition entries are developed in Peer Assisted Learning (PAL) sessions, under the guidance of the second-year-student PAL tutors. Participation in these competitions helps students to develop personal and interpersonal and project management core skills as well as enhancing their knowledge and understanding of emerging areas of importance. It also helps to instill a strong sense of self-worth in both the participating students and the wider cohort, and helps students to understand that academic achievement is only one part of the skills mix required for success in life.

- The second year 'Power up' programme for CSCT students focuses on employability and consists of a mixture of department wide activities, jointly run (employer led) employability workshops and, additionally for ITMB/ SEfB, off-site, employer run mock selection centres and CV clinics.

- The 3 level vertically integrated practice theme provides a focus for the integration of academic learning and the practical application of technical, personal and interpersonal skills. It is of great value in preparing students as reflective practitioners and provides high quality work experience (especially to those students who elect not to undertake a placement year).

STUDENT AND ACADEMIC SERVICES

FOR OFFICE USE ONLY

First CAP Approval Date	18th February 2014			
Revision CAP Approval Date	29 May 2018	Version	2	Link to RIA (ID 4749)
Next Periodic Curriculum Review due date				
Date of last Periodic Curriculum Review				