STUDENT AND ACADEMIC SERVICES

UWE Bristol | University of the West of England

PROGRAMME SPECIFICATION

Part 1: Basic Data	
Awarding Institution	University of the West of England , Bristol
Teaching Institution	University of West of England, Bristol.
Delivery Location	University of the West of England, Bristol. Frenchay Campus
Study abroad / Exchange / Credit recognition	
Faculty responsible for programme	Environment and Technology
Department responsible for programme	Computer Science and Creative Technologies
Modular Scheme Title	
Professional Statutory or Regulatory Body Links	Confirmation of accreditation for this integrated programme is being sought
Highest Award Title	BSc(Hons) Cyber Security & Digital Forensics
Default Award Title	
Fall-back Award Title	
Interim Award Titles	Cert HE Cyber Security & Digital Forensics Dip HE Cyber Security & Digital Forensics BSc Cyber Security & Digital Forensics
UWE Progression Route	
Mode(s) of Delivery	FT and SW with Foundation year
ISIS Codes	**G4H4** G4HB (SW), G4HB13 (FT)
Relevant QAA Subject Benchmark Statements	Computing (primary) Law (secondary)
First Approval Date	June 2015	Valid from	September 2015
Revision Approval Date	January 2020	Revised with effect from	September 2020
Version	4		

Part 2: Educational Aims of the Programme
The general aims of the programme are: 1. To prepare students for careers in computer security and computer crime-investigation (e.g. 'forensic technician') 2. To develop problem-solving, communication and other transferable skills applicable to a variety of careers 3. To prepare students for study for higher degrees in related subjects

Part 2: Educational Aims of the Programme

The specific aims of the programme are
1. To develop knowledge of computer hardware and software systems
2. To provide an understanding of applicable law, court procedure and the role of the expert witness
3. To introduce a variety of approaches to both the analysis of the security requirements of computer systems and the investigation of computer crime

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

Graduates in the field of Computer Security and Computer Forensics would be expected to have an excellent understanding of the internal operation of computers and operating and file systems. They would be able to use appropriate tools to investigate computer-based activities, deploy tools and techniques to prevent security breaches and investigate the mis-use of computer systems and other devices. As much of this work is carried out either directly in support of legal processes an understanding of appropriate legal systems and law would be expected.

Part 3: Learning Outcomes of the Programme

The focus of the foundation year (level 0) is in the acquisition both of appropriate academic skills and relevant subject knowledge to allow studnets to develop and progress through levels 1, 2 and 3 in relation to knowledge and understanding, cognitive, subject specific and study skills.

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:**

1. Computer systems and networks Trusted computing base, threats and security policy. Computer security mechanisms in networks and computers at various layers and levels. Security technology innovations.
2. Information, data and its representation and organisation in computer systems
3. National legal system and court procedure. Skills and responsibilities of a forensic computing practitioner and expert witness
4. Law pertaining to computer crime and digital evidence and its investigation and legal and commercial aspects of Computer Security and Forensics
5. Security management. Defining, modelling and describing the concepts of trust and security policy. Securing access to services and applications from various devices.
6. Tools and techniques for investigating computer crime such as data mining and profiling

(B) Intellectual Skills

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

(C) Subject/Professional/Practical Skills

1. Understand a variety of computer systems, configurations and networking topologies
2. Understand the professional and legal obligations of forensic computing investigations and be able to communicate with legal personnel at an appropriate level
3. Be able to assess a computer crime scene and formulate a strategy for securing the evidence, investigating it impartially, and produce a report in appropriate language
4. Describe the key security mechanisms used in access control, authentication, encryption and digital signatures and perform systems analysis in terms of computer security.
5. Use software libraries and toolkits to implement security aware applications conforming to appropriate

Part 3: Learning Outcomes of the Programme

designs

6. Employ a range of tools and notations to support the activities listed above.
7. Know the limits of their knowledge and how to extend those limits through self-managed learning

(D) Transferable skills and other attributes

1. Communication skills**:** to communicate orally or in writing, including, for instance, the results of technical investigations, to peers and/or to "problem owners".
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.
3. IT Skills in Context (to use software in the context of problem-solving investigations, and to interpret findings)
4. Problem formulation: To express problems in appropriate notations.
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.
6. Comprehension of professional literature: to read and to use literature sources appropriate to the discipline to support learning activities.
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.

LEARNING OUTCOMES											

SECTION A: KNOWLEDGE AND UNDERSTANDING	UFCFGL-30-1	UFCF93-30-1	UFCFTK-30-1	UFCFP4-30-1	UFCFWK-15-2	UFCFJ6-30-2	UJUUKM-30-2	UFCFLC-30-2	UFCFXK-30-3 Or UFCFM5-30-3	UFCFRB-15-3	UFCFC5-15-3
Computer systems and networks.	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Information, data and its representation.	✓		✓	✓	✓	✓		✓	✓	✓	✓
	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
National legal systems and court procedures.				✓			✓		?		
				✓					?		
Law pertaining to computer crime and digital evidence.				✓		✓	✓		?	✓	✓
				✓		✓			?	✓	✓
Security management			✓	✓	✓	✓		✓	?	✓	
				✓	✓	✓		✓	?	✓	
Tools and techniques for investigating computer crime.				✓		✓			?		✓
				✓		✓			?		✓

SECTION B: INTELLECTUAL SKILLS	UFCFGL-30-1	UFCF93-30-1	UFCFTK-30-1	UFCFP4-30-1	UFCFWK-15-2	UFCFJ6-30-2	UJUUKM-30-2	UFCFLC-30-2	UFCFXK-30-3 Or UFCFM5-30-3	UFCFRB-15-3	UFCFC5-15-3
Critical Thinking	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Analysis	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Synthesis of different types of Information	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓		✓	✓	✓	✓		✓	✓	✓	✓
Evaluation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓		✓	✓	✓	✓		✓	✓	✓	✓
Problem Solving	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
	✓		✓	✓	✓	✓			✓	✓	✓
Appreciate problem contexts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓		✓	✓	✓	✓			✓	✓	✓
Balance conflicting objectives	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
	✓		✓	✓	✓	✓			✓	✓	✓

LEARNING OUTCOMES

SECTION C: SUBJECT PROFESSIONAL PRACTICAL SKILLS	UFCFGL-30-1	UFCF93-30-1	UFCFTK-30-1	UFCFP4-30-1	UFCFWK-15-2	UFCFJ6-30-2	UJUUKM-30-2	UFCFLC-30-2	UFCFXK-30-3 Or UFCFM5-30-3	UFCFRB-15-3	UFCFC5-15-3
Understand a variety of computer systems	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Understand professional and legal obligations				✓		✓	✓	✓	✓	✓	✓
				✓		✓			✓	✓	✓
Be able to assess a computer crime scene.				✓		✓					✓
				✓		✓					✓
Describe key security mechanisms.				✓		✓		✓		✓	
				✓	✓	✓		✓		✓	
Use software libraries and toolkits.	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
	✓		✓	✓	✓	✓			✓	✓	✓
Employ a range of tools and notations.	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Know the limits of their knowledge.	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

LEARNING OUTCOMES

SECTION D: TRANSFERABLE SKILLS AND OTHER ATTRIBUTES:	UFCFGL-30-1	UFCF93-30-1	UFCFP4-30-1	UFCFP4-30-1	UFCFWK-15-2	UFCFJ6-30-2	UJUUKM-30-2	UFCFLC-30-2	UFCFXK-30-3 Or UFCFM5-30-3	UFCFRB-15-3	UFCFC5-15-3
Communication skills			✓	✓		✓	✓		✓	✓	✓
				✓		✓			✓	✓	✓
Self-management skills	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IT Skills in Context	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Problem formulation	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Progression to independent learning	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Comprehension of professional literature	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Working with Others			✓	✓		✓				✓	✓
				✓		✓				✓	✓

Part 4: Student Learning and Student Support

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 will be embedded within the programme which, together with the contact time, will enable learning outcomes to be achieved and demonstrated.

On the Forensic Computing and Security programme teaching is a mix of scheduled learning, independent learning and, possibly, placement learning.

Scheduled learning includes lectures, seminars, tutorials, project supervision, demonstration, practical classes and workshops. Scheduled sessions may vary slightly depending on the module choices made.

Independent learning includes hours engaged with essential reading, technical subject practice, case study preparation, assignment preparation and completion etc. Scheduled sessions may vary slightly depending on the module choices made.

Placement learning: The University and the department provide support in preparation for the placement in a number of ways. For example, during the second year, the department arranges a series of talks from former placement students and industrialists, aimed at illustrating the benefits of the placement year. Support in applying for placements is also provided through CV workshops, advertising of placement vacancies and more general information on careers and employability. Students who do not do a year-long placement are encouraged to gain work experience in other ways, for example through volunteering, summer interships and entrepreneurial schemes.

Students on the Sandwich route must take the level-three module, Professional Experience, while they are undertaking the placement.

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

This section specifies the features and minimum standards of support that could be expected at UWE

Class Activities The teaching and learning methods are determined by the Module Leader, and typically involves a combination of one or more lectures, tutorials, 'lectorials', laboratory classes, group activities and individual project work. Modules are often delivered by means of 'lectorials', classes for groups of 20-30 students with no distinction between lectures and tutorials, and this has proved to be an effective mechanism for modules at all levels.

Where modules are common with other programmes, students will typically be taught together (which gives students the opportunity to appreciate the material from the viewpoint of different computing disciplines). However, a specialist flavour may be given to a common module through the provision of discipline specific practical, laboratory or tutorial material supporting a core of common lectures.

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..

Virtual Learning Environment
UWE uses the Blackboard virtual learning environment to support the delivery of modules. All students at UWE have access to Blackboard for all modules on which they are enrolled. For most modules course materials and announcements are provided through Blackboard and for many modules the additional facilities provided by Blackboard are utilised to (e.g.) run formative tests, provide online forums and provide access to provisional coursework marks.

Pastoral Care
At UWE the faculty offers pastoral care through its Student Advisers, a team of staff who provide

Part 4: Student Learning and Student Support

comprehensive, full-time student support service on a drop-in basis or by appointment. All students on the same route are allocated to the same Adviser, who is 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 UWE's Student Services Department 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 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.
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.

LEARNING RESOURCES

At UWE 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.

STUDENT SUPPORT AND GUIDANCE

At UWE, 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.

In addition, BSc (Hons) Computer Security and Forensics will students will be encouraged to use social networking (e.g. Facebook) to interact – a strategy that has proven highly valuable on the existing UWE Forensic Computing degree. The Facebook site fosters social and academic contacts between students on all years of the Programme and acts as an initial portal for applicants and a forum for graduates.

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

Part 4: Student Learning and Student Support

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.

Teaching resources provided for students

At UWE 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.

Part 5: Assessment

A: Approved to University Regulations and Procedures

It is the Award Board's responsibility to determine whether the student's attainment at level 0 is sufficient to progress to level 1

Assessment Strategy

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

Assessment strategies for Forensic Computing and Security focus on ensuring a strong technical knowledge of computing devices, skills in the use of appropriate forensic tools and abilities in devising and deploying security measures.

Part 6: Programme Structure

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

ENTRY		Compulsory Modules	Optional Modules	Awards
	Year 1 (Level 0)	UFCFQN-30-0 Computational Thinking and Practice UFCFPN-30-0 Information Practitioner Foundations UFCFRN-30-0 Creative Technology Studies UFCFTN-30-0 Web Foundations	*None*	120 credits at Level 0 Successful completion of all level 0 modules required to permit progression to level 1.
		Compulsory Modules	Optional Modules	Interim Awards
	Year 2 (Level 1)	UFCFGL-30-1 Programming in C++ UFCF93-30-1 Computer and Network Systems UFCFTK-30-1 Introduction to Databases UFCFP4-30-1 Computer Crime and Digital Evidence	None	**Interim award**: Certificate of Higher Education Cyber Security & Digital Forensics Credit Requirements: 240 credits At least 100 credits at level 1 or above. 120 credits at level 0
		Compulsory Modules	Optional Modules	Interim Awards
	Year 3 (Level 2)	UFCFWK-15-2 Operating Systems UFCFJ6-30-2 Security and Forensic Tools UJUUKM-30-2 Law, Experts and Justice UFCFLC-30-2 Secure Computer Networks	UFCFVK-15-2 Internet of Things UFCFDL-15-2 Secure Embedded Systems	**Interim award**: Diploma Higher Education Cyber Security & Digital Forensics Credit requirements: 360 credits At least 100 credits at level 2 or above. At least 120 credits at level 1 or above. 120 credits at level 0.

Year Out *Students at UWE taking the 4-year degree programme will complete a 40 week work placement. UWE sandwich-year placement students complete UFCFE6-15-3 Professional Experience or UFCFWJ-15-3 International Experience whilst on placement.*

	Compulsory Modules	Optional Modules	Interim Awards
Year 4 (Level 3)	UFCFRB-15-3 Security Management in Practice UFCFC5-15-3 Forensic Computing Practice	**UWE students take 30 credits from:** UFCFXK-30-3 Digital Systems Project OR UFCFM5-30-3 IS Dissertation **UWE students take 45 credits from:** UFCFM6-15-3 Requirements Engineering UFCFU3-15-3 Advanced Databases UFCFT4-15-3 Cryptography UFCF95-15-3 Entrepreneurial Skills UFCFEL-15-3 Security Data Analytics and Visualisation UFCFA5-15-3 Networks, Information and Society **and 15 credits from:** UFCFE6-15-3 Professional Experience (studied during placement year) OR UFCFB5-15-3 Ethical and Professional Issues OR UFCFWJ-15-3 International Experience (studied during placement year) OR UFCFVJ-15-3 Professional Development	**Interim award**: BSc Cyber Security & Digital Forensics Credit requirements: 420 credits At least 60 credits at level 3 or above. At least 100 credits at level 2 or above. At least 140 credits at level 1 or above. 120 credits at level 0. **HIGHEST AWARD:** BSc(Hons) Cyber Security & Digital Forensics Credit requirements: 480 credits At least 100 credits at level 3 or above. At least 100 credits at level 2 or above. At least 140 credits at level 1 or above. 120 credits at level 0.

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Part 7: Entry Requirements

The University's Standard Entry Requirements apply according to the year and point of entry.

Tariff points as appropriate for year of entry – up-to-date requirements are available through the [courses database](#).

Part 8: Reference Points and Benchmarks

This programme is consistent with the UWE 2020 strategy in that its focus on the practice of computer security and forensics aligns with our aim of producing practice-oriented graduates.

In addition, the programme adopts the general approach of the department of Computer Science and Creative Technologies in including input from industry in terms both of visiting speakers and placement and work experience opportunities.

The QAA Computing and Law benchmark statements

The QAA Subject Benchmark Statements for Computing and for Law were published in 2007, and are applicable to this programme.

The programme clearly falls into the cognate area described by the Computing benchmark. Due to the nature of Forensic Computing practice, much of the computing material is of a technical, low-level nature, with relatively little computing theory. Thus, in terms of the benchmark's high-level characterisation of Computing, the emphasis of the programme is on software, communication and interaction and practice, developed within the context of the specialised requirements of the programme. From the body of knowledge the following are considered essential to a study of Forensic Computing: Data Mining (in the context of forensic investigations); Computer Based Systems; Computer Networks; Data Structures and Algorithms, with emphasis on data structures; Distributed Computer Systems; Operating Systems; Programming Fundamentals; Security and Privacy; Web-based Computing.

The Computing Benchmark Statement also contains (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 proposed programme will be able to meet the required standards.

The Law benchmark has been considered during the design process at the 'Law as Subsidiary' level of performance, which focuses on the development of legal skills related to some specific area (in this case Forensic Computing). Though the Statement is targeted at programmes with at least 180 credits of legal subjects, its expectations also apply to programmes such as Forensic Computing, where the legal aspects make up a relatively small, but very important component. No attempt has been made to include all aspects of law or to provide the foundation for a legal career as such – instead the most important points of law and court procedure are covered. The aim of the design team has been to provide sufficient legal knowledge to be aware of the rules and legal system pertaining to Forensic Computing: as suggested in the Benchmark, the relevant law is treated mainly as data from which legal conclusions or opinions can be derived. It is expected that student will be able to assimilate legal information from a variety of sources and apply the knowledge acquired to computer crime investigation and security analysis.

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FOR OFFICE USE ONLY

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