

# **University of Plymouth**

Faculty of Science and Engineering

School of Engineering, Computing and Mathematics

## **Programme Specification**

BSc (Hons) Cyber Security (6894)

September 2020

## 1. Undergraduate Computing Programme Suite

**Final award title** BSc (Hons) Cyber Security

**Level 6 Intermediate award title** A student achieving 320 taught credits, of which at least 80 are at Level 6, 120 are at Level 5 and 120 at Level 4, is eligible for the award of Bachelor of Science (BSc) degree.

**Level 5 Intermediate award title** A student achieving 240 credits, of which at least 120 are at Level 5 or above, is eligible for the award of a Diploma of Higher Education (DipHE). Level H: (HE2).

**Level 4 Intermediate award title** A student achieving 120 credits at Level 4 is eligible for the award of a Certificate of Higher Education (CertHE). Level: H (HE1).

**UCAS code** G406 BSc (Hons) Cyber Security

**HECOS code** CAH11 Computing

2. **Awarding Institution:** University of Plymouth

**Teaching institution(s):** University of Plymouth

## 3. Accrediting body

Summary of specific conditions/regulations:

BCS – The Chartered Institute for IT Professionals. Accreditation will be sought for 2020 entry.

Condition of accreditation for partial CEng status: the programme is permitted a maximum compensation of 30 credits – this is a new condition based upon changes stipulated by the Engineering Council (May 2019)

#### 4. Distinctive Features of the Programme and the Student Experience

The BSc (Hons) Cyber Security programme has the following distinctive features:

- Taught by a team of internationally recognised cyber security experts with extensive research and commercial experience that is drawn upon in a research-led teaching experience; providing students with an exciting opportunity to engage with world-leading research.
- The School has strong links with the general computing industry and specifically the cyber security profession. These links include the National Cyber Security Centre, Kaspersky and the Chartered Institute for Information Security Professionals, and seek to embed relevant real-world industrial problems directly into teaching. The programme is supported by an Industrial Advisory Panel that provides feedback on the industrial relevance of its taught material.
- An optional (highly recommended) placement year in industry enables students to obtain a professional insight into the application of their knowledge and skills and offers invaluable experience of the professional environment. Internal analysis of placement students' performance conducted within the School of Engineering, Computing and Mathematics has shown that undertaking a placement has a strong positive impact on degree outcome and employment prospects.
- The programme incorporates a substantial element of practical based work. Operating out of our dedicated cyber range, students will have access to a range of industry-accepted software to learn and hone their skills. The programme's assessment is completely coursework and practice based, meaning that students with special educational needs are not disadvantaged and providing authentic and holistic means of assessing progress.
- We promote learning through practice and doing, and a prominent feature of all three stages of the degree is a practice module that provides a holistic learning experience for students, drawing on the rest of their taught content from that stage (and earlier) and combining it to produce outputs of a professional standard.
- Excellent employment opportunities, through a wide variety of organisations from larger corporate organisations to small-to-medium companies.
- A schedule of academic-supported student-led activities, such as hackathons and a thriving student-run society.

## 5. Relevant QAA Subject Benchmark Group(s)

Computing<sup>1</sup> and the ACM Curriculum statement for Computer Science<sup>2</sup>

## 6. Programme Structure

**Stage 1.** HE Level 4. All modules are 20 credits, with the exception of COMP1004 which is 40 credits.

Semester One

COMP1001 <b>Software Engineering 1</b>	COMP1001 <b>Computer Systems</b>	COMP1004 <b>Computing Practice</b>	BPIE111 <b>Stage 1 Computing Placement Preparation.</b> <b>0 credits.</b>
Semester Two			
COMP1002 <b>Cyber Security &amp; Networks</b>	COMP1003 <b>Algorithms &amp; Data Structures</b>		

**Stage 2.** HE Level 5. All modules are 20 credits, with the exception of COMP2003 which is 40 credits.

Semester One

COMP2000 <b>Software Engineering 2</b>	COMP2001 <b>Information Management &amp; Retrieval</b>	COMP2003 <b>Computing Group Project</b>	BPIE211 <b>Stage 2 Computing Placement Preparation.</b> <b>0 credits.</b>
Semester Two			
COMP2002 <b>Artificial Intelligence</b>	COMP2006 <b>Security Architectures and Cryptography</b>		

<sup>1</sup> [https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-computing-16.pdf?sfvrsn=26e1f781\\_12](https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-computing-16.pdf?sfvrsn=26e1f781_12)

<sup>2</sup> [https://www.acm.org/binaries/content/assets/education/cs2013\\_web\\_final.pdf](https://www.acm.org/binaries/content/assets/education/cs2013_web_final.pdf)

**Stage 3. Optional Placement – BPIE330 Computing Placement.**

Successful completion of this optional placement will result in a Certificate of Industrial Experience.

**Stage 4. HE Level 6.** All modules are 20 credits, with the exception of COMP3000 which is 40 credits.

Semester One

COMP3009 <b>Information Security Management and Governance</b>	COMP3010 <b>Security Operations and Incident Management</b>	COMP3000 <b>Computing Individual Project</b>
Semester Two		
COMP3011 <b>Ethical Hacking</b>	COMP3012 <b>Digital Forensics and Malware Analysis</b>	

**Core Programme**

Module Code	Module Title	Credit	Semester	CW %	Practice %
<b>Stage 1- 120 Level 4 Credits</b>					
COMP1000	Software Engineering 1	20	S1	100	0
COMP1001	Computer Systems	20	S1	100	0
COMP1002	Cyber Security & Networks	20	S2	100	0
COMP1003	Algorithms & Data Structures	20	S2	100	0
COMP1004	Computing Practice	40	S1&2	80	20
<b>Stage 2- 120 Level 5 Credits</b>					
COMP2000	Software Engineering 2	20	S1	100	0
COMP2001	Information Management & Retrieval	20	S1	100	0
COMP2002	Artificial Intelligence	20	S2	100	0
COMP2003	Computing Group Project	40	S1&2	80	20
COMP2006	Security Architectures and Cryptography	20	S2	100	0
<b>Stage 4- 120 Level 6 Credits</b>					
COMP3000	Computing Individual Project	40	S1&2	80	20
COMP3009	Information Security Management and Governance	20	S1	100	0

COMP3010	Security Operations and Incident Management	20	S1	100	0
COMP3011	Ethical Hacking	20	S2	100	0
COMP3004	Digital Forensics and Malware Analysis	20	S2	100	0

### **UPIC Students**

The UPIC integrated programme consists of Stage 1 (Level 4) of the standard programme together with ILS1005: Interactive Learning Skills and Communications. Successful completion of both of these components allows students to proceed to Stage 2 (Level 5) of the standard programme.

## **7. Programme Aims**

The programme shares the subject aims for Computing courses within the Faculty of Science and Engineering, which are:

- 1) To give students with a wide variety of qualifications an opportunity to realise their potential.
- 2) To enrich the curriculum content and teaching quality through the professional and/or research expertise of staff and through links to external organisations.
- 3) To encourage and support students while they develop and apply subject-specific and generic skills that will facilitate life-long learning and continuing professional development.
- 4) To produce graduates who can make a significant contribution to their chosen profession.
- 5) To provide an understanding of common algorithms, design patterns and computational models, and to apply these techniques to create high quality computer software and systems.
- 6) To produce graduates who are technical experts, but who also have an awareness of the business, social, legal and ethical contexts of IT.
- 7) To encourage exploration and enthusiasm for both the subject of computing and to encourage creativity.

In addition, each programme will have the following specific programme aims.

- 9) To establish a broad foundation of knowledge and skills required for all aspects of system design and development of secure systems.
- 10) To provide the theoretical and practical skills required to provide information security advice, planning and implementation to an organisation.
- 11) The ability to investigate, critically analyse and identify the root cause of computer-based malicious activity.

12) To be informative and challenging, and to establish a knowledge base suitable for a career in cyber security.

## **8. Programme Intended Learning Outcomes**

### **8.1. Knowledge and understanding**

On successful completion graduates should have developed:

- 1) An ability to recognise the fundamental concepts, principles and theories relating to computing and computer applications as appropriate to the programme of study.
- 2) A comprehensive understanding of system design and programming
- 3) An understanding of the legal, regulatory, professional and ethical responsibilities involved in the exploitation of computer technology.
- 4) Detailed knowledge and understanding of essential facts, concepts, principles and theories related to information security

### **8.2. Cognitive and intellectual skills**

On successful completion graduates should have developed:

- 1) The ability to apply appropriate knowledge and skills to the modelling and design of computer-based system.
- 2) The skills to recognise and analyse criteria and specifications appropriate to specific problems, and plan strategies for their solution.
- 3) The ability to analyse the extent to which a computer-based system meets the criteria defined for its current use and future development.
- 4) The capability to deploy appropriate theory, practices and tools for the specification, design, implementation and evaluation of computer-based systems.
- 5) An awareness of the risks, safety issues, legislation and regulatory requirements when designing/managing an information system.

### **8.3. Key and transferable skills**

On successful completion graduates should have developed the ability to:

- 1) Communicate effectively in writing and verbally
- 2) Manage resources and time
- 3) Critique and self-evaluate
- 4) Work both autonomously and as part of a team when required
- 5) Discuss and debate problems and issues to learn effectively for the purpose of continuing professional development.
- 6) Work as a member of a development team

- 7) Use industry standard tools for collaboration

#### **8.4. Employment related skills**

On successful completion graduates should have developed:

- 1) Initiative and personal responsibility
- 2) The ability to work both autonomously and within a team
- 3) Effective communication and debating skills
- 4) The ability to make decisions based on incomplete information
- 5) The educational skills required for deep learning

#### **8.5. Practical skills**

On successful completion graduates should have developed the ability to:

- 1) Specify, design and construct computer-based systems.
- 2) Effectively deploy the tools used for the construction and documentation of computer applications.
- 3) Recognise risks or safety aspects that may be involved in the operation of computing and information systems.
- 4) Prepare technical reports.
- 5) Give technical presentations.
- 6) Use scientific literature effectively.
- 7) Design and construct complex, robust and secure multi-tier computer systems suitable for a variety of platforms and devices.

#### **8.6 Accreditation specific learning outcomes in Computing**

Additionally degree graduates in the BSc (Hons) computing suite should be able to demonstrate the following specific learning outcomes using the BCS Accreditation criteria for CITP and CEng

- 1) Knowledge and understanding of commercial and economic context of development
- 2) Knowledge and understanding of management techniques required to achieve objectives in a computing context
- 3) Knowledge and understanding of information security issues in relation to the design, development and use of information systems
- 4) Knowledge and understanding of scientific and engineering principles
- 5) Knowledge and understanding of mathematical principles
- 6) Knowledge and understanding of computational modelling
- 7) Use appropriate theoretical and practical processes to specify, deploy, verify and maintain computer-based systems
- 8) Define problems, manage design process and evaluate outcomes
- 9) Apply principles of appropriate supporting engineering and scientific disciplines



## 9. Admissions Criteria, including APCL, APEL and Disability Service arrangements

All applicants must have GCSE (or equivalent) Maths at Grade B or above and English at Grade C or above.

Entry Requirements for BSc (Hons) Cyber Security	
A-level/AS-level	112-120 points. All subjects except General Studies, Critical Thinking and Citizenship are considered, but at least one technical subject is preferred. Key Skills are not included in the points calculation.  GCSE Maths Grade C/5. If you have a Grade C/4 in Maths please contact Admissions.
BTEC National Diploma/QCF Extended Diploma	<b>18 Units BTEC National Diploma/QCF Extended Diploma:</b> DDM – science related subjects. <b>Acceptable subjects:</b> IT, Engineering, Software Development, IT Practitioners, Computing, Science. Art/Sports/Business or Humanities related subjects refer to Admissions Tutor.
Access to Higher Education at level 3	Pass a named Access to HE Diploma (e.g., Computing/IT/Science/Humanities/Engineering), (including GCSE English and Maths at grade C/4 or above, or equivalent) with at least 33 credits at Merit and/or Distinction to include 12 credits at level 3 in Maths with Merit. If not level 3 Maths refer to Admissions Tutor.
Welsh Baccalaureate	Accepted as 120 add on points towards the 300 points requirements but must have 2 A Levels, preferably one of which is in a technical subject.
Scottish Qualifications Authority	300 points. Technical subjects preferred.
Irish Leaving Certificate	ABBBB in Highers. Irish Leaving Cert Ordinary Level Grade C or above for English or Maths.
International Baccalaureate	30 overall – English and Mathematics must be included.
European Baccalaureate	75% overall to include 7.5 in English or first language.
Progression from BSc (Hons) Computing with Foundation Year	Pass foundation year with overall average of 50% or above.
UPIC Integrated Programme	Admission to the programme is subject to successful foundation of the University of Plymouth International College (UPIC) Foundation Year with an aggregate mark of at least 60% in each of the modules studied (65% in ILS1005: Interactive Learning Skills and Communications).  Direct entry onto Level 4 (first year of the BSc degree) is also possible. Applicants are required to have the equivalent of 112 UCAS tariff points and an overall IELTS score of 6.0 (no less than 5.5 in any element). UPIC

Admissions should liaise with the relevant UoP subject contact to identify any specific entry requirements prior to making any direct offers.
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For all other qualifications please refer to the Admissions Tutor.

The University's regulations for Accreditation of Prior Learning (APCL) and Assessment of Prior Experiential Learning (APEL) are set out in the "University Academic Regulations", a copy of which can be found at <https://www.plymouth.ac.uk/student-life/your-studies/essential-information/regulations>

Evidence of prior learning and experience from applicants is welcome. Due to the range and mixture of prior qualifications and experience, applications presenting such evidence will be considered on an individual basis by the Admissions Tutor in consultation with the Programme Team.

Overseas students for whom English is not the first language will be expected to demonstrate proficiency in English with a minimum IELTS score of 6.0 or equivalent. Equivalencies are described in "Admissions Information and Procedures", issued by the University Secretariat.

### **Key Skills**

Key skills tariff points do not count towards the admissions tariff score, however they are likely to enhance your performance on the computing suite of degree programmes.

### **Partnership Agreements**

#### UPIC Stage 1 Equivalent Integrated Programmes

- On successful completion of a Stage 0 programme UPIC students progress to Stage 1 of their designated programme, and are taught and assessed by UoP staff. Additionally, the students will undertake a module (ILS 1005) of skills and support designed to facilitate their transition to the HE learning culture in the UK.
- Progression to Stage 1 Integrated programmes is dependent on achieving 50% in all modules of the UPIC Stage 0 programme (55% in SCI 131).
- Progression to Stage 2 is dependent on successful completion of the UoP Stage 1 and at ILS 1005 (The UPIC DMD for ILS 1005 is appended).

Progression to Stage 2 and Stage 4 of the programme is possible but subject to the approval of the Programme Manager.

### **10. Progression criteria for Final and Intermediate Awards**

BSc (Hons) Cyber Security (Level HE6) on satisfactory completion of 120 L6, 120 L5 and 120 L4 credits.

BSc Cyber Security (Level HE6) on satisfactory completion of 80 L6, 120 L5 and 120 L4 credits.

Diploma of Higher Education (Level HE5) on satisfactory completion of 120 L5 and 120 L4 credits.

Certificate of Higher Education (Level HE4) on satisfactory completion of 120 L4 credits.

## 11. Non Standard Regulations

A student can only be compensated for a maximum of 20 credits within the programme at any level. Otherwise the programmes adhere to all current University regulations.

## 12. Transitional Arrangements

2019/20 Module Code	New Module Code
SOFT152	COMP1000
NET112	COMP1001
SEC104	COMP1002
SOFT153	COMP1003
ISAD157	COMP1004
SOFT166	COMP1004
SOFT252	COMP2000
ISAD251	COMP2001
AIN252	COMP2002
PRCO204	COMP2003
SOFT261	COMP2004
ISAD261	COMP2005
SEC205	COMP2006
PRCO304	COMP3000
SOFT354	COMP3001
AIN2357	COMP3002
AIN2351	COMP3003
ISAD362	COMP3005
SOFT355	COMP3006

SEC301	COMP3009
SEC303	COMP3010
SEC302	COMP3011
SEC305	COMP3012
AIN355	COMP3014
AIN354	COMP3015
SOF356	COMP3016

# Appendix 1: Programme Specification Mapping (UG): module contribution to the meeting of Award Learning Outcomes

**CORE MODULES:** Award Learning Outcomes the module contributes to through its assessed learning outcomes.

	Software Engineering 1					Software Engineering 2					Project					
	Software Engineering 1	Computer Systems	Cyber Security and Networks	Algorithms and Data Structures	Computing Practice 1	Software Engineering 2	Information Management and Retrieval	Artificial Intelligence	Computing Group Project	Security Architectures and Cryptography	Project	Information Security Management and Governance	Security Operations and Incident Management	Ethical Hacking	Digital Forensics and Malware Analysis	
Award learning Outcomes contributed to	COMP1000	COMP1001	COMP1002	COMP1003	COMP1004	COMP2000	COMP2001	COMP2002	COMP2003	COMP2006	COMP3000	COMP3009	COMP3010	COMP3011	COMP3012	
Credits	20	20	20	20	40	20	20	20	40	20	40	20	20	20	20	
Core (C) / Elective €	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Degree : A = all	A	A	A	A	A	A	A	A	A	CSE	A	CSEC				
<b>8.1 Knowledge &amp; Understanding</b>																
8.1.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8.1.2	X	X			X	X	X		X		X					
8.1.3			X		X		X	X	X	X	X	X	X	X	X	
8.1.4			X		X				X	X	X	X	X	X	X	
<b>8.2 Cognitive &amp; Intellectual skills</b>																
8.2.1	X		X	X	X	X	X	X	X	X	X		X	X	X	
8.2.2		X	X		X		X	X	X	X	X	X	X			
8.2.3		X	X		X			X	X	X	X		X			
8.2.4	X	X		X	X	X			X		X		X			
8.2.5			X		X				X	X	X	X	X	X	X	
<b>8.3 Key &amp; Transferable skills</b>																
8.3.1			X		X		X	X	X	X	X	X	X	X	X	
8.3.2					X				X		X				X	
8.3.3					X			X	X	X	X	X			X	
8.3.4					X				X		X				X	
8.3.5	X				X			X	X		X	X	X		X	
8.3.6					X				X		X					
8.3.7					X				X		X					
<b>8.4 Employment related skills</b>																
8.4.1	X				X				X		X					
8.4.2					X		X		X		X		X			
8.4.3					X		X	X			X	X	X	X		
8.4.4	X				X				X		X	X				
8.4.5					X		X	X	X		X					
<b>8.5 Practical skills</b>																
8.5.1	X	X		X	X	X	X		X	X	X		X			
8.5.2	X	X	X		X	X			X		X					
8.5.3		X	X				X	X	X		X	X	X	X	X	
8.5.4			X		X	X	X	X	X		X	X	X	X	X	
8.5.5					X		X	X			X					
8.5.6					X	X	X				X	X	X		X	
8.5.7	X		X		X	X			X	X	X	X	X	X	X	
<b>8.6 Accreditation specific skills</b>																
8.6.1					X				X	X	X	X		X		
8.6.2					X				X		X					
8.6.3			X	X	X	X			X		X					
8.6.4							X	X			X			X		
8.6.5			X	X				X	X		X	X		X	X	
8.6.6	X				X	X	X	X	X		X	X	X	X	X	
8.6.7	X	X			X	X			X	X	X	X	X			
8.6.8			X	X	X	X	X	X	X		X	X	X			
8.6.9					X				X		X					