Programme Specification Template - Undergraduate

SECTION A: CORE INFORMATION

1.	Name of programme:	Cybersecurity and Digital Forensics
2.	Award title:	(e.g. BSc Honours)
3.	Programme linkage:	Is this part of group of linked programmes between which students can transfer at agreed points? Yes This programme is one of a group of related programmes which also includes: BSc (Honours) Web and Mobile Development BSc (Honours) Business Technology BSc (Honours) Game Development BSc (Honours) Computer Science BSc (Honours) Networks and Cybersecurity MComp (Honours) Computer Science Together they form a suite of 7 long programmes, with the three programmes of the Stage 3 Suite also sharing some level 6 modules: BSc (Honours) Computer Systems Engineering BSc (Honours) Applied Business Computing BSc (Honours) Network Systems It is possible to transfer between these programmes at the end of level 4 in the long programme suite. This is subject to students meeting the progression regulations for stage 1.
4.	Is the programme a top-up only?	No
5.	Does the programme have a Foundation Year (Level 3) associated with it so that students enter for a four-year programme and progress directly from the Foundation Year to Stage 1 without having to re-apply?	Yes Students can take the Integrated Foundation Year (Level 3) as an integral part of this programme of study. For details of the Foundation Year see the programme specification *for BSc (Hons) Computer Science with Integrated Foundation Year.*

6.	Level of award:	Level 6
7.	Awarding Body:	University of Sunderland
8.	Department:	Faculty of Computer Science
9.	Programme Studies Board:	Undergraduate Computing
10.	Programme Leader:	Dr Chris Bowerman

11. How and where can I study the programme?

At Sunderland:	
Full-time on campus	✓
Part-time on campus	
As work-based learning full-time	
As work-based learning part-time	
As a full-time sandwich course	✓
As a part-time sandwich course	
By distance learning	

At the University of Sunderland London campus:	
Full-time on campus	
Part-time on campus	
As work-based learning full-time	
As work-based learning part-time	
As a full-time sandwich course	
As a part-time sandwich course	
By distance learning	

At a partner college:	
Full-time in the UK	
Part-time in the UK	
Full-time overseas	
Part-time overseas	
By distance learning	
As a full-time sandwich course in the UK	
As a part-time sandwich course in the UK	
As a full-time sandwich course overseas	
As a part-time sandwich course overseas	
As work-based learning full-time in the UK	
As work-based learning part-time overseas	
Other (please specify)	

12. How long does the programme take?

	Min number of years / months	Max number of years / months
Full-time	3	9
Part-time		
Distance learning		
Work-based learning		

For start-dates please see the current edition of the Prospectus or contact the relevant department at the University. For start-dates for programmes delivered in a partner college, please contact the relevant college.

SECTION B: FURTHER CORE INFORMATION

Use Outline Programme Proposal Form for ADC for questions 13 to 25

26. Learning and teaching strategy.

The primary aim of this programme is to provide education in the theory and practice of computing with special emphasis in the area of computer and digital forensics. The programme aims to produce highly skilled and professional graduates with abilities in resolving computer forensic problems and cases, preserving the evidential integrity in computer forensic analysis, developing and managing computing solutions, being knowledgeable of current and emergent technologies with particular emphasis to computer and digital forensics, understanding legal, social, ethical and professional responsibilities of computer forensics practitioners and having a broad awareness of the computing industry.

The programme aims to provide students with the knowledge to professionally, systematically and impartially address the needs of cybersecurity and digital forensics professionals. In digital forensics students will approach the preservation and extraction of all relevant digital evidence from computers, computer systems and computer networks (including the Internet) applying appropriate theory and underpinning principles (computing principles and computer forensics principles) using appropriate tools and techniques. In cybersecurity the programme is designed to enable students to learn about the principles, theories, standards, policies and procedures associated with cybersecurity and to apply these in a series of practical, exciting and innovative ways. The programme will also examine the overlap between cybersecurity and digital forensics and the preventative approach to cybercrime. Additionally, all graduates would leave with a set of transferable graduate skills which could be utilised in other career paths e.g. education.

With a faculty mission statement: *"To be recognised by our students as providing them with an excellent academic experience, preparing them for employment or starting their own enterprise",* it should be evident that student experience is at the core of our thinking in programme conception, design and pedagogical approach. Student experience also motivates our ideas about delivery. In both the curriculum design and the delivery, we have carefully considered the student market (through speaking with potential applicants, current applicants, current undergraduates, and graduates) and reflected on our teaching experience particularly with recent first year cohorts. Student interests, desires and motivations change rapidly and perhaps particularly so in the domain of technology, and so we are constantly engaged in dialogue with them to complement the experiences and views of our teaching staff, the aims of our institutional Learning and Teaching Plan, the professed needs of business and industry, the stipulations of our professional accreditation bodies, and the requirements of the subject benchmark statements, in deciding how to improve our offering. Our aims are to ensure relevance and balance in the curriculum, its delivery and its assessment; timely and meaningful assessment feedback dialogue; and continuity of pastoral care and personal development through a close knit team of programme and level staff and use of module-related e-portfolio.

In terms of the curriculum, this means room for development of, at stage 1, key skills, and additionally, core computing subject skills, degree-specific (flavour) skills, intellectual/transferable skills to enhance employability, and enterprise skills. In accordance with the University Learning and Teaching Plan we strive always to develop independent, active and reflective learners; create learning environments where teaching approaches, learning technologies, and institutional structures and culture foster these learners; and promote learning partnerships in which innovative, supportive and challenging practice, inspires students to approach their courses and careers with

curiosity, enthusiasm and creativity. In terms of delivery we employ a blended teaching and learning approach, which at stage 1 in particular is closely tied in to pastoral care and PDP. At the heart of stage 1 is the employment of the university's eportfolio which we use as an integrated vehicle for student personal development, reflection, recording and presentation of work and achievement, and interaction with the personal tutor and level leader. The department has devoted considerable time in recent years investigating and disseminating in partnership with our students how to engender enthusiasm, creativity and inspiring learning and teaching within our curricula. We have always sought to embed employability into the curriculum and have a long history of working closely with our colleagues in Careers and Employability Services to achieve this, and we have worked consistently to expose our students to real-world industrial activity through means of extracurricular workshops, developer days and such-like opportunities. More and more however we are embedding the extracurricular into our everyday learning and teaching practice, as seen for example in the introduction of Professional Practice Weeks in which students not only undertake their assessment within specified weeks but also we involve personal tutors, Sunderland Futures, Students Union, alumni, external employers, representatives of the mentorship scheme etc., to provide activities relating to professional practice. Assessment, dealt with in detail in the next section, is carefully thought out in terms of its variety and practicality. Assessment feedback, meanwhile, is of utmost importance to our delivery, and our innovative work in that regard is also detailed in the next section.

We believe the curriculum we have designed provides a balanced and stringent approach to the development of the skills needed by today's computing graduates. Certain modules in the offering are very explicit about their skills focus – for example the Software Engineering Enterprise and Innovation Project at stage 2, the Project and the Software Enterprise module at stage 3 all really speak to employability. Others clearly have principles of skills development embedded within but in a much more implicit way. Reflective learning – a key part of PDP – is embedded right from stage 1 through the 100 credit Fundamentals of Computing module, the stage 2 project, the Industrial Placement, and the stage 3 Project. E-portfolio is a key tool on all of these modules.

Research Active Curriculum: Research active staff are involved in the delivery of teaching across the complete range of our programmes. We actively map teaching teams to modules based on the relevance of their current activities and previous experience. The resulting cross-fertilisation of research and teaching means that our modules remain current in a rapidly developing field. We also encourage staff and students to engage in research activity directly within modules or via extra-curricula schemes.

27. Retention strategy.

A major driver behind the development of the computing suite of programmes has been the concept of student support. Deciding which programme to study for three years is not an easy process for many of our students, and some find that the nature of computing is very different from what their school career or their leisure interests have led them to believe it is. Furthermore, as part of our commitment to Widening Participation, students are not expected to have prior experience of the subject (although they must meet the standard university entrance requirements). Therefore, it is imperative that our students feel supported in their learning, feel comfortable with not grasping difficult concepts first time around and understand they can engage in scaffolded learning supported by peers, tutors, and pastoral carers. To further support student learning, and to aid retention and progression, the academic year for stage 1 students is punctuated by consolidation periods which we call Professional Practice Weeks. Not only are these an attempt to professionalise and make more 'real world' and 'real-time' the nature of the assessments we ask the students to engage in, they serve as useful junctures for engagement with personal tutors to check engagement and progress through face to face meetings and checking of eportfolio updating.

Pastoral Care is taken very seriously by the department. At stage 1 there are key staff who teach on the fundamentals module who undertake pastoral care. During the Professional Practice Weeks there are targeted sessions with personal tutors/programme leaders, not only to engender

programme-specific professional practice and allow for targeted career sessions but also as checkpoints in student engagement and progression through both face to face discussions and checking of engagement in the construction of the eportfolio. In addition, at stage 1 there is a level leader who oversees the smooth running of the year. At stages 2 and 3, as with stage 1, the programme leaders are closely involved in the teaching of the students for example it is they who typically supervise their own students' individual projects at stage 3.

On the very last day of term 3 each year, we hold a showcase and award giving event for all undergraduate students. This is in part celebration of our students' achievement and in part a chance for them to see each other's work and the nature of what they can achieve in subsequent years. Hence it is also an opportunity for reflecting on progress, for sharing and networking and we feel therefore a contributor towards retention, motivation and success.

28. Any other information.

At stage 1, students enter the programme of their choice. All study the fundamentals module plus a module designated by their programme choice. Throughout stage 1, students are in regular contact with their personal tutor through teaching on the fundamentals module, face to face meetings, and regular monitoring of the students' e-portfolio activity (a key retention initiative). These tutors are therefore excellently placed for advising the student during stage 1 which optional modules they should select in year two. This decision will be carefully made based on performance in stage 1 and may even lead to a student changing programme to one for which they show a greater aptitude.

All students have individual access to their Programme (and Module) Leaders on a needs basis and formally timetabled in accordance with the university student support/personal tutoring policy. We also use programme spaces/noticeboards within the VLE, as well as email interaction to provide flexible and efficient communication on day to day issues. Programme teams meet with student representatives each term in Staff Student Consultative Committees (SSCCs) in order to formally record issues around the student experience. In many instances, issues can quickly and easily be resolved in this way. In some cases they need referral to the Boards of Study. In either event, Sunspace is used as a mechanism for formally feeding back to the students regarding the resolution or otherwise of the issues raised.

At stage 2 students are supported by their Programme Leaders who also form part of the teaching team for that level. In addition, the Placement Module Leader plays a role in readying them for an industrial placement, should they wish to undertake that option, by means of targeted activities during the stage 2 project's 'Context' teaching sessions, through advertising of vacancies on Sunspace, arranging employer presentations and visits, on- and off-site interviews, and general liaison with students, staff and employers. Our Careers and Employability Services (CES) link advisor is also an important part of our stage 2 placement preparation, providing information and guidance through presentations and advice on for example CVs and interviews. This person is an integrated member of the Stage 2 project module, delivering targeted careers development sessions during core module contact time with the students. The Stage 2 project staff are also valuable in helping the students develop more business oriented, client focused and employability skills which again stand them in good stead for securing an industrial placement. Again, several of these staff are also programme leaders.

Student support while on the placement is through the module leader and their assigned visiting tutor who visits them in their workplace twice during the year and also maintains contact via phone, and email at other times. The student is also supported by a workplace supervisor while on placement. Students, tutors and the company supervisor operate within a set of clear guidelines and pertinent advice given in the Placement Module Handbook.

Furthermore, throughout their study at stages 1, 2 and 3, our students study a range of modules, and have access to extra-curricular opportunities, that are very much client focused and well supported for skills development, for example the Sunderland Professional Award, Leading Lights, The Mentoring Scheme, paid and voluntary short term placement opportunities. All students

undertake the second year group based Software Engineering Enterprise and Innovation Project which provides the opportunity for them to work on the development of a system for a real-world client. The client has a close working relationship with the students throughout the year, providing feedback at different stages and some help with judging the final outcomes. Similarly, the stage 3 project encourages real industrial/business sponsorship, and former placement students often develop software for their placement company.

It has been described above that students are advised in the second term of stage 1 which route they will take in stage 2. Similarly, during the second term of stage 2, students meet with their level leader to select their options for stage 3. Even students who are about to take up a placement year will record their module choices at this point, although it is possible that they could change while they are away from the university. Regardless, the module choices or change of choice would be signed off in term 3 before the start of stage 3. This not only helps the department in allocating resources to best support the students, but also allows students to start orienting themselves towards their study choices, reading around the subject etc., should they choose to do so.

SECTION C: TEACHING AND LEARNING

29. What is the programme about?

The primary aim of this programme is to provide education in the theory and practice of computing with special emphasis in the area of computer and digital forensics. The programme aims to produce highly skilled and professional graduates with abilities in resolving computer forensic problems and cases, preserving the evidential integrity in computer forensic analysis, developing and managing computing solutions, being knowledgeable of current and emergent technologies with particular emphasis to computer and digital forensics, understanding legal, social, ethical and professional responsibilities of practitioners and having a broad awareness of the computing industry.

The programme aims to provide students with the knowledge to professionally, systematically and impartially approach the preservation and extraction of all relevant digital evidence from computers, computer systems and computer networks (including the Internet) applying appropriate theory and underpinning principles (computing principles computer forensics principles and cybersecurity principles) using appropriate tools and techniques. Additionally all graduates would leave with a set of transferable graduate skills which could be utilised in other career paths e.g. education.
The programme will be accessible to students from a wide range of backgrounds as long as they meet the standard University entrance requirements. Students will not be expected to have prior experience of this subject field. In doing so it aims to allow those with the appropriate interest, motivation and potential to successfully pursue their personal aspirations and in doing so contribute to fulfilling the social and economic requirement for a professional workforce within this field and in the shaping of its future development.

More specifically this programme aims to ensure the following:

- To produce highly motivated, technically competent individuals who have the awareness, understanding and the necessary flexibility to effectively utilise and continually re-develop their own knowledge and skills of technologies and tools used within computer forensics.
- To produce graduates with specific computer forensics knowledge and skills thereby opening up a range of specialist employment opportunities.
- To increase a student's theoretical knowledge and focus on current research in the field of computer forensics.

- To produce graduates with a high level of transferable skills in order that they are ready for a number of career paths and are highly employable and attractive to local, regional and national companies.

30. What will I know or be able to do at each Stage of the programme?

Learning Outcomes Stage 1 – Skills

By the end of this Stage of the programme successful students should know, understand or be able to do the following:

		QAA Benchmark
S1	Manage and schedule small projects within both time and resourcing constraints	PRA-3, PRA-6, TRA-5
S2	Make use of software engineering techniques to design, develop and test a range of software solutions	PRA-1, PRA-2, PRA-4, PRA-5
S3	Locate and utilise information from a range of sources including books, journals and online articles.	TRA-2
S4	Make appropriate use of IT to prepare presentations, compile reports and analyse numerical data.	PRA-5, TRA-2

Learning Outcomes Stage 1 – Knowledge

By the end of this Stage of the programme successful students should know, understand or be able to do the following**:**

		QAA Benchmark
K1	Understanding of the theoretical underpinnings of computer science, cyber security and digital forensics	COG-1, COG-2
K2	Appraisal of the fundamental operation of computer systems, network architectures, hardware components, operating systems and associated protocols and data structures	COG-1, COG-2 COG-3, COG-4
K3	Knowledge of the standards, tools and techniques used in the production of information, multimedia and web-based systems	COG-4, COG-5, COG-6, COG-7
K4	Recognition of the need for adaptable formal approaches to problem solving.	COG-5, COG-6, COG-7, COG-8
K5	Knowledge of the expectations of the key cybersecurity properties of confidentiality, integrity and availability	COG-3, COG-8

Learning Outcomes Stage 2 – Skills

By the end of this Stage of the programme successful students should know, understand or be able to do the following:

		QAA Benchmark
S5	Employ a range of specialist techniques in order to undertake the design and development of complex computer-based systems with particular reference to cybersecurity and digital forensics	PRA-1, PRA-2, PRA-5
S6	Employ conceptual tools across all aspects of the systems lifecycle, including: requirements analysis, specification, implementation, security design, testing, documentation and maintenance.	PRA-1, PRA-2 PRA-4, PRA-5, PRA-6
S7	Perform quantitative and qualitative analysis in order to evaluate solutions to technical, business and theoretical problems	PRA-5
S8	Manage and reflect on own learning in order to achieve effective work practices both as an individual and as a member of a team	PRA-3, TRA-1, TRA-3, TRA-5

Learning Outcomes Stage 2 – Knowledge

By the end of this Stage of the programme successful students should know, understand or be able to do the following:

		QAA Benchmark
K6	Understanding of the industrial, security, professional, legal and ethical issues associated in the context of cybersecurity and digital forensics	COG-1, COG-8
K7	Knowledge of all aspects of the systems lifecycle, including: requirements analysis, specification, implementation, testing, documentation and maintenance.	COG-5, COG-6, COG-7
K8	Knowledge of a range of specialist cybersecurity and digital forensics tools and techniques and how they may subsequently be applied to solve real-world problems within an application domain in a secure and trustworthy manner..	COG-1, COG-2, COG-3, COG-5
K9	Recognition of the need to evaluate computer-based solutions using an appropriate methodology	COG-6, COG-7

Learning Outcomes Stage 3 – Skills

By the end of this Stage of the programme successful students should know, understand or be able to do the following:

		QAA Benchmark
S9	Undertake independent research in order to identify appropriate methods, tools, and techniques to address complex problems in cybersecurity and digital forensics	TRA-2, PRA-4, PRA-5, TRA-6

S10	Seize, extract, and preserve digital evidence whilst maintaining evidential integrity and evidential continuity	TRA-5, PRA-1, PRA-4, PRA-5
S11	Learn, critically appraise and evaluate both new concepts in technology and own skills development in preparation for the life-long challenge of working in a continually changing environment.	PRA-2, TRA-1, TRA-3, TRA-6, TRA-7

Learning Outcomes Stage 3 – Knowledge

By the end of this Stage of the programme successful students should know, understand or be able to do the following:

		QAA Benchmark
K10	Understanding of research methods in the context of synthesising and interpreting knowledge in cybersecurity and digital forensics	COG-1, COG-2 COG-5, COG-7, COG-8
K11	In-depth knowledge of the theory, principles and practices underpinning computing in the context of cybersecurity and digital forensics	COG-1, COG-2, COG-3, COG-4, COG-5, COG-6, COG-7
K12	An in-depth understanding of the state of the art in selected specialist area(s) of computing relevant to digital investigations e.g. Professional and Ethical Issues, Advanced Cybersecurity, Ethical Hacking, Software Enterprise	COG-1, COG-2, COG-3

Learning Outcomes – Ordinary degree

If you are awarded an Ordinary degree you will have achieved the majority of the learning outcomes for the programme studied. However you will have gained fewer credits at Stage 3 than students awarded an Honours degree, your knowledge will typically be less broad and you will typically be less proficient in higher-level skills such as independent learning.

Learning Outcomes Sandwich Award

Students awarded a degree under the sandwich model will have successfully completed CET210 industrial placement year. This learning opportunity is offered to students between stages two and three and provides those that choose to engage in a placement the chance to be assessed on the following additional learning outcomes:

Learning Outcomes Sandwich – Knowledge

By the end of this Stage of the programme successful students should know, understand or be able to do the following:

		QAA Benchmark
K13	Knowledge in an industrial context relating to the their programme of studies	COG-1, COG-5, COG-8

Learning Outcomes Sandwich – Skills

By the end of this Stage of the programme successful students should know, understand or be able to do the following:

		QAA Benchmark
S12	Apply skills learned during their study in an industrial context.	PRA-3, PRA-4, PRA-5 TRA-1, TRA-3, TRA-4, TRA-5, TRA-6

31. What will the programme consist of?

Each undergraduate programme consists of a number of Stages from a minimum of 1 to a maximum of 4, each of which is equivalent to a year's full-time study. The summary below describes briefly what is contained in each Stage. Most programmes have a mixture of core (ie compulsory) modules and optional ones, often with increasing choice as you move through the programme and gain in experience. In some programmes the choice of optional modules gives you particular 'routes' through the programme. The programme structure including a detailed list of modules can be found in the programme regulations.

The BSc (Honours) in Cybersecurity & Digital Forensics programme is oriented towards the specific requirements of the discipline of computer forensics. The programme addresses the fundamental and underpinning principles of computing as designated in the Computing Benchmark whilst focussing on the theoretical, technical, professional, legal, legislative and social aspects and concepts of computer forensics.

The updated programme has been developed to address contemporary issues in the developing field of computer and digital forensics. The programme integrates the principles and professional standards of the computing discipline. Application of the programme philosophy will produce computing professionals who are able to combine established IT professional good practice and technical skills with the ability to effectively work in the field of computer forensics, solving computer forensics problems, address issues associated with computer crime and enhance the quality of society by making computer systems more secure and robust.

The professional requirements of the computer forensics practitioner will be incorporated throughout the programme curriculum. The programme has been designed to address the requirements of BCS accreditation and to contribute to the expectations of the BCS registration scheme from the Council for the Registration of Forensic Practitioners.

The content of this programme and the skills and techniques developed in the programme are potentially damaging if used maliciously and the capabilities developed in this programme have potential for harm. Academics will emphasise the professional expectations of students working in this domain as well as stress the students' ethical and moral responsibilities to themselves and others, including the department, the faculty and the University.

Stage 1

During their first year, students study the 100 credit module CET101 'Fundamentals of Computing'; this is undertaken by all Stage 1 Computing students across the Department regardless of degree title. The purpose of this module is to expose students to the complete range of theoretical concepts that underpin computing and computational science so that as they move forward and specialise at stages 2 and 3 they have a solid foundation on which to build. CET101 comprises a number of integrated strands covering both theory and practice in areas such as programming, software engineering, computer architectures, operating systems, networks, database applications and web based multimedia. The learning and teaching strategy used is one of integration and contextualisation of this varied subject matter with assessment that is cross-topic and portfolio based with initially low stake assessment that builds over the course of the year into a complete portfolio, the capstone of which is an individual project which is the sole occupation of the final term. This approach allows students to incrementally develop the key skills required to undertake any of the six degree programmes.

In addition to CET101, students also study a taster module that is relevant to their chosen course thus allowing them to experience a flavour of their specialism without committing to it. The Cybersecurity and Digital Forensics students take the level 4 module, CET120 "Foundations of Cybersecurity and Digital Forensics" (20 credits). The module provides a broad introduction to the principles of cybersecurity and digital forensics from both theoretical and technical perspectives. The topics of Cybersecurity and digital forensics will be related to other aspects of computing and computer science including computer system fundamentals, operating systems, computer hardware, programming and system design – contextualising the syllabus covered elsewhere at Level 4.

Students who successfully complete stage 1 can progress to stage 2 of any of the computing titles within our portfolio. Students are counselled about their choice of degree based on the portfolio of marks they have achieved during the year and their realisation of their desired pathway having experienced the nature of the subjects and having exposed to possible career routes during their first year studies.

Stage 2

At stage 2 all students studying on the undergraduate suite of computing programmes take a pair of 20 credit modules: CET232 Personalised Skills Development and CET233 Software Enterprise Project. These modules provide students with key skills such as self-determination, planning and actioning of goals, time management, independent learning and team working. In CET233 specifically they work in integrated groups to undertake a large scale development either for a real client or to realise an enterprising idea that their group has personally conceived and developed. Thus they are exposed to the principles of software engineering and development in the context of real world and real client needs and demands. To this end there is a focus on ethics, professionalism and security related issues within the software development and technology management industries. The ultimate aim of both of these modules is to create employable students who are life-long learners and are ready for placement and employment opportunities in the computing industry.

For students studying towards a named degree in 'Cybersecurity and Digital Forensics' the remaining 80 credits are comprised of four 20 credit modules:- 'Theoretical Aspects of Cybersecurity and digital Forensics', CET221 'Practical Aspects of Computer Forensics', CET214 'Network Fundamentals' and CET211 'Intermediate Software Development'.

CET240 ‘Theoretical Aspects of Cybersecurity and Digital Forensics’ provides students with a knowledge of ethical issues and challenges facing computer forensic practitioners and ethical hackers and the skills to produce designs for secure computing systems and apply the principles of computational modelling to computer forensics and cybersecurity.

CET221 ‘Practical Aspects of Computer Forensics’ provides students with an understanding of computer forensic investigations and the expectations of professional bodies i.e. the Forensic Science Society and of the criminal justice system and the skills to apply appropriate legal, documentary and evidentiary standards to present investigative findings in a court of law.

CET214 ‘Network Fundamentals’ and CET211 ‘Intermediate Software Development’ further develop students understanding of core networking and programming techniques which are important for the application of digital forensics and cyber security skills.

Stage 3

At stage 3 all computing students undertake the 40 credit CET300 ‘Computing Project’. In this module students undertake advanced study in order to define, research and develop to completion a substantial piece of individual work that demonstrates the range of skills acquired on their programme of study.

Core modules for ‘Computer Forensics’ students are CET304 ‘Advanced Computer Forensics’, CET350 ‘Professional issues in Cybersecurity and Digital Forensics ‘ and CET324 ‘Advanced Cyber Security’.

CET304 ‘Advanced Computer Forensics’ provides students with the depth of knowledge and understanding in current, specialist and sensitive areas in computer forensics. This module develops students’ theoretical and technical skills to a more advanced level than the stage 2 module, and provides the opportunity for students to critically examine the more contentious and ethically sensitive areas associated with computer forensics such as tracking paedophiles and addressing issues such as child pornography. The principles of maintaining the integrity of digital evidence in the securing, recovering and analysing of that evidence will be explored in depth from a range of different sources of potential digital evidence are emphasised in this module

CET350 ‘Professional Issues in Cybersecurity and Digital Forensics’ provides students with the opportunity to examine the professional and ethical aspects of cybersecurity and digital forensics and to develop an understanding of the particular legal and evidentiary challenges and the risk management requirements in these subject areas. In addition, students will develop their critical analysis and research skills through an examination of the current issues in both subject areas.

CET324 ‘Advanced Cyber Security’ provides the opportunity to critically discuss the challenges facing the cyber security practitioner and apply techniques for implementing computer systems that are reliable and include effective security protocols.

Students also take one optional 20 credit module giving them the opportunity to specialise in either a theoretical or practical oriented subject that particularly interests them. Options will potentially include Ethical Hacking, Advanced Routing, Telecommunications, and Software Enterprise.

Placement/Work Based Learning

All students are strongly encouraged to take up a 48-week industrial placement after their Stage 2 studies. This enables them to gain valuable industrial experience and also to put the practical skills learnt in the modules into practice in a real-world environment. Placements can be with local, national, and international companies, such as Accenture, SAGE, BT, GlaxoSmithKline, BA, European Space Agency, AT&T Global and CERN. We support students in applying for these placements and indeed help ready them for the application process right from first year, through into second year. This support takes the form of regular personal development (PDP) embedded in their core fundamentals module (CET101) and core personalised skills development (CET232) and software enterprise project (CET233) modules, which are taught and supported by both personal tutors and careers link advisers, and underpinned by the e-portfolio system. In addition we have Placement Champions who are final year students returned from placement who promote the benefits of placement to stage 1 and 2 students through personal profile posters, talks in classes, and availability for one to one discussions when wearing their Placement Champion hoodies. Students start compiling CVs at stage 1 and in stage 2 they are supported in application writing and interview preparation including guest sessions/mock interviews and assessment centres from employers such as SAGE and BA.

The Stage 2 core module, CET233 'Software Enterprise Project', is work-related. It requires students to respond to 'Invitations to Tender' from industrial sponsors who have identified specific developments which they require. (This is a process which is mocked-up in Professsional Practice Weeks in stage 1 and 2 where problems to be solved are real world in nature with proxy clients.) In CET233 students work in development teams and work occasionally with the industrial sponsors, who also provide feedback and judgement on the work of the team.

CET232 enables students to prepare for placement or to gain shorter work experience or workplace skills, for example through shadowing, volunteering or mentoring, if they do not pursue the sandwich degree route.

All students undertaking the Stage 3 Computing Project are encouraged to source a project proposal directly from an industrial sponsor and liaise with that sponsor throughout the life-span of the project. If they do not have a real client then academics play the role of client, acting as project 'sponsor' so that all students have the opportunity to develop client-facing skills throughout the year (usually specified in the context of six 30 minute client interactions across the project).

Throughout their time with us, students are encouraged to engage with Sunderland Futures which offers a further range of work based learning opportunities: from voluntary or paid short term placements, to internships; from the Mentoring Scheme which helps prepare students for the world of work, to the chance to take part in leadership training through Leading Lights; from becoming a Student Ambassador, to gaining the opportunity of a place in the Enterprise Place. These opportunities are additional to the taught curriculum and are well received by students. In addition to the opportunities in CET232, they can be of particular interest for students who may wish not to undertake the 48-week placement route, yet want to build up a professional portfolio in readiness for graduate applications.

Study Abroad

All students have the opportunity to apply for Scholarships abroad. Where such opportunities are undertaken, the Programme Leader provides advice to the student on the equivalence of their proposed programme of study to their programme in the UK. Students are also able to undertake a work placement year abroad though opportunities tend to be more limited.

32. How will I be taught?

Scheduled teaching activities	✓
Independent study	✓
Placement	✓The programme has an optional 48 week sandwich placement between 2nd and 3rd year

As a subject area, computing is very hands-on yet it also requires the facility for developing mastery of theoretical and technical principles as well as generic and transferable skills. Thus our physical and virtual learning environments must offer diverse opportunities. The core of our teaching building is formed of several computer 'cells' or labs used for hands-on tutorials and project work, surrounded by traditional large lecture theatres. Within this physical environment we teach through lectures, interactive lectorials, lab-based practicals, classroom based seminars and group problem solving sessions, case studies, guest expert lectures, one-to-one and group supervisions. Our students use PCs, Macs, commercial games consoles, Lego robots, IoT devices and mobile devices, including their own phones (which we have seen enhances understanding of different platforms and increases motivation, as well as provides portability of their work to show family members, friends and potential employers during interview). Lectorial rooms are smaller than lecture theatres and allow interactive teaching while students work at PCs under the lecturer's direction. Practical sessions for networking, telecommunications, game development and cybersecurity take place in specialised labs. We have a dedicated Learning Lab for interactive group work scenarios. In addition, our students use 'break out' areas with comfortable seating and refreshment areas where they can chat and engage in group work which is a significant part of their stage 1 and 2 learning.

At stage 1 students study a common 100 credits hence the learning experience is largely the same for all students and includes large group teaching in large lecture theatres plus smaller group seminar and tutor-group based activities. In stage 2 they share the core group project which makes use of the Learning Lab and the Problem Based Learning areas and encourages team work for developing skills in analysis, scheduling, managing, and communicating problem solutions. The personally negotiated content of CET232 means that students on the module learn in different ways and in different contexts from each other, so that although there are lectorials and one to one meetings for all students, some may learn for example in the context of an organisation they are volunteering or work shadowing in, while others may be engaged in online classes, presentations, mock assessment centres etc. On this module, as in others, great use is made of eportfolio learning in terms of gathering evidence, reflecting on learning and curating material for presentation. In stage 3 learning and teaching is more individually focused with project work receiving individual supervision, and all modules seeking to develop skills in planning, design and development and the ability to evaluate the self and the published work of others. Increasingly as students progress through their studies they are exposed to approaches that seek to promote student-centred, enquiry-based learning for fostering creativity, critical enquiry and independent thinking, in line with our Research Active Curriculum commitment.

Outside of the university buildings, our partnerships with key technology providers like Microsoft and CISCO allow us to offer free software downloads for student home-study. We operate a Global Desktop System that allows students to remotely access the same software environments we have installed in our teaching areas. We also use the VLE to provide directed reading and development tasks, group online discussions, eportfolio development, wikis etc. Students can access staff, module descriptors, handbooks, MyModuleResources, taught materials, external resource links, online submission and the eportfolio through the VLE.

A list of the modules in each Stage of the programme can be found in the Programme Regulations.

A summary of the types of teaching, learning and assessment in each module of the programme can be found in the Matrix of Modes of Teaching.

33. How will I be assessed and given feedback? Modes of assessment aligned with KIS: choose one or more.

Portfolios	✓
Coursework	✓
Practical assessments	✓
Written examinations	✓

A summary of the types of teaching, learning and assessment in each module of the programme can be found in the Matrix of Modes of Teaching.

The generic assessment criteria which we use can be found here. Some programmes use subject-specific assessment criteria which are based on the generic ones.

This programme uses the Generic University Assessment Criteria	**YES**	~~**NO**~~
This programme uses the Subject Specific Assessment Criteria	**YES**	~~**NO**~~

The University regulations can be found here.

Each September the school staff engage in a week long LTA conference which involves assessment consideration, thinking about Universal Design for Learning (UDL), Research Active Curriculum (RAC) for example as well as assessment scheduling to determine when assessments will take place for each module and ensure that every programme, and hence every student, has an assessment load that is fairly balanced across the year. Throughout their degree, students are encouraged to use the e-portfolio to collect, reflect upon and showcase their assessed work-pieces, which is useful both in PDP and in applications for placements and graduate employment.

At stage 1 for the 100 credit module, there are 2 low stake pieces of work in term 1, 4 of slightly higher worth in term 2, as students gain in skills and confidence, and the year ends with a showcase project worth 40%. The smaller module's assessment regime complements this approach. The assessments on the fundamentals module are 'cross-topic', underlining the relevance of all the topics we teach. Stage 1 is assessed using coursework which can be practical development work, written reports, presentations, and time constrained tests. We have a weekly session called 'context' to consolidate learning and discuss and feedback on assessment. Our feedback approach in all three stages is underpinned by our experience of the ESWAF project (Engaging Students with Assessment Feedback) in which the university was a cascade partner and this school a contributor. Our feedback models include the use of peer review, CRAFTing and generic feedback which allow partial submissions that are commented on with the opportunity to further improve, and the use of exemplars to help students understand what is expected of them. In addition the school contributed to the university's recent 'feedforward' project, showcasing how all stage 1 students are required to feedforward on their feedback from previous assessments at the start of every new assessment.

We are now in the fourth year of delivering assessment of the 100 credit module at stage 1 within self-contained weeks which we call Professional Practice Weeks. Building upon the successful 'consolidation weeks' that we previously pioneered in the Faculty and the institution, we stop normal teaching activity during these weeks and require the students to solve problems in more real-time and evolving scenarios. The assessments follow a single theme and are for a single 'client' across the academic year. The problem is issued at 9am Monday and students

submit their solutions by the end of Friday. These weeks have had such success that we are now implementing them in 2nd year from 2017-18 academic year.

Across the three years much assessment is based around practical work as the subject dictates. This usually consists of the design, development, testing and evaluation of computer systems, components or assets, troubleshooting exercises, live demonstrations and interactions (both 'job interviews' and academic vivas) and the simulation, construction and testing of networks. Professional Practice Weeks, where they are used, allow us to mimic real world scenarios under time constraints that occur in industry (just days to fix components of a problem), thus helping students to develop time management skills and the ability to think on their feet. Formal examinations are phased in at stage 2, and held also in stage 3, but the practical nature of the industry as well as the principles of UDL with its notion of construct relevance and irrelevance (the relationship between the assessment instrument and its corresponding intended learning outcomes) mean that the value of a more practical, skills based and real world approach is uppermost in our thinking when designing assessment. Alongside practical coursework, there is a focus on use of portfolio and eportfolio to enable feedback to be given and feedforward to be actioned during the learning that is taking place over the course of the module.

In the Industrial Placement module the Visiting Tutor assesses the student's evidence-based portfolio alongside progress reports from the student and company supervisor. The student must identify the skills they wish to develop and the practical means to achieve these. The portfolio provides the evidence and level of achievement of these skills.
The culmination of the degree programme is the major independent piece of research and development encapsulated in the final year Project. While students engage in assessed group work at stages 1 and 2, summative group assessment is discouraged entirely at Stage 3.

The University aims to return marked assessments and feedback within 4 working weeks of the assignment submission date after internal moderation processes have been completed. If this is not possible, students are notified by the Module Leaders when the feedback is available and how it can be obtained. Where possible, in part we aim to feedback more immediately than 4 weeks by the use of live demos of developed artefacts.

The Academic Misconduct Regulations and associated guidance can be found here. It is the responsibility of students to ensure they are familiar with their responsibilities in regards to assessments and the implications of an allegation of academic misconduct.

Students should refer to the University Regulations for information on degree classifications and compensation between modules.

34. Teaching, learning and assessment matrix

NB. Not all option modules may be offered in any one academic year and will depend on the availability of staff and the priorities of the school. In addition, modules will usually need to be selected by a minimum number of students. Option modules may be available on more than one programme and the Programme Leaders will liaise with the Faculty Management Team to ensure there is a reasonable amount of choice in any given year.

Stage 1

Code	Title	Core / Option	Modes of T&L	Modes of Assessment	Learning Outcomes								
					K1	K2	K3	K4	K5	S1	S2	S3	S4
CET101	Fundamentals of Computing	Core	Lectures, Seminars, Tutorials, Directed Study, VLE instruction & support, Self Study	CW – E-Portfolio 1 CW – E-Portfolio 2 CW – Individual Project	T D A	T D A	T D A	T D A	T D A	T D A	T D A	T D A	T D A
CET120	Foundations of Cybersecurity & Digital Forensics	Designated Option	Lectures, Seminars, Supervised Practical, Self Study	CW – Written Report CW – Written Report		T D		T D A	T D	T D A		T D A	T D A
CET121	Digital Media Design & Development	Option	Lectures, Tutorials, Self Study	CW - Portfolio			T D A	T D A		T D A	T D A	T D	T D A
CET123	Introduction to Game Development	Option	Lectures, Tutorials, Self Study	CW – Design Document CW – Practical Build Assignment		T D A	T D	T D A		T D A		T D	T D A
CET122	Digital Solutions for Business	Option		CW - Portfolio									
CET105	Computational Thinking	Option	Lectures, Seminars, Practicals, Self Study	CW – Report CW – Presentation	T D A	T D A		T D A		T D A		T D A	T D A

Stage 2

Code	Title	Status	Modes of T&L	Modes of Assessment	Learning Outcomes

Appendix 2

					K6	K7	K8	K9	S5	S6	S7	S8
CET232	Personalised Skills Development	Core	Lectures, Seminars, Individual Supervision, Workshops, Online learning, Placement,	CW - Portfolio	T D A		T D A			D	D	T D A
CET233	Software Enterprise Project	Core	Lectures Workshops Self Study	CW – Group Presentations CW – Group Portfolio CW – Individual Portfolio	T D A	T D A	T D A	T D A	T D A	T D A	T D A	T D A
CET211	Intermediate Software Development	Core	Lectures, Tutorials, Self Study	CW - TCT CW - Practical Build Assignment		T D A	T D A	T D A	T D A	T D A	T D A	D
CET214	Network Fundamentals	Core	Lectorials Practical Labs Self Study	CW - TCT CW - TCT		T D A	T D A	T D A	T D A	T D A	T D A	D
CET240	Theoretical Aspects of Cybersecurity and Digital Forensics	Core	Lectures Seminars Supervised practicals Formative assessment Self study	CW - technical report & practical demo Exam	T D A	T D A	T D A	T D A	T D A	T D A	T D A	D
CET221	Practical Aspects of CF	Core	Lectures Seminars Supervised practicals Formative assessment Self study	CW - Technical Report CW - Investigative Report & Courtroom Presentation	T D A	T D A	T D A	T D A	T D A	T D A	T D A	D

Stage 3

Code	Title	Status	Modes of T&L	Modes of Assessment	Learning Outcomes					
					K10	K11	K12	S9	S10	S11
CET300	Computing Project	Core	Lectures Tutorials Workshops Individual Supervision Self Study	CW – Definitive Brief CW – Project Reviews CW – Report CW – Software Artefact CW – Presentation and VIVA	T D A	T D A		T D A	T D A	T D A

CET304	Advanced Computer Forensics	Core	Lectures Seminars Case Studies Formative assessment Self study	CW - Practical Analytical Exercise CW - Analytical research Report	D A	T D A	T D A	D A	T D A	T D A
CET350	Professional Issues in Cybersecurity and Digital Forensics	Core	Lectures Seminars Case Studies Formative assessment Self study	CW - Research Report Exam	D A	T D A	T D A	D A	T D A	T D A
CET324	Advanced Cybersecurity	Core	Lectures Practicals Self Study	CW – report(s) and practical aspects	D A	T D A	T D A	D A	T D A	T D A
CET340	Students into Schools	Option	Lectures Practicals Self Study Placement	CW - Portfolio build and interview		D A	D A	T		
CET310	Software Enterprise	Option	Lectures Tutorials Workshops Formative Assessment Portfolio Development Self Study	CW – Portfolio	T D A		T D A	T D A		T D A
CET312	Ethical Hacking	Option	Lectures Practicals Expert/Guest Speakers Self Study	CW - Practical analytical exercise CW - Analytical Research Report	D A	T D A	T D A	D A	T D A	T D A
CET303	Telecommunications	Option	Lectures Tutorials Practical Labs Self Study	CW - Portfolio	D A	T D A	T D A	D A		D A
CET327	Advanced Routing	Option	Lectures Tutorials Practical Labs Self Study	CW - Practical analytical exercise Exam	D A	T D A	T D A	D A		D A

Sandwich

Code	Title	Status	Modes of T&L	Modes of Assessment	Learning Outcomes	
					K13	S12

CET210	Industrial Project	Core	Industrial experience acquired through the course of a 9 month placement.	CW – Portfolio CW – Two Reviews	T D A	T D A

*Indicates a compulsory module which must be successfully passed for progression to further modules or to the next academic year of study.

35. How does research influence the programme?

Research within the Faculty of Computer Science is organised into a Research Institute. The Research Institute for FCS focuses on developing and implementing sustainable research in FCS, providing a nurturing, supportive, developmental, inclusive research culture. The institute has five main strands of research; Cybersecurity, Data Science, HCI/UXD, AI/Machine Learning, and Pedagogic Research in Computer Science. Each of these draws from a number of areas both within and beyond FCS. Drawing our research together under these strands allows us to clearly identify the ways in which clusters of researchers bring their different subject expertise together to tackle a range of interesting research problems in the digital economy. Moreover, it is also a risk mitigation strategy since it enables subject specific expertise to develop while still leaving robust strands of research.

Cybersecurity research in the FCS has a direct impact on the teaching of this programme informing CET120, CET240, CET305 and CET324 directly. Current cybersecurity research focusses on incident response (cross over between digital forensics and cybersecurity), threat sharing policies and strategies, and gender issues in cybersecurity.

Data Science research has impact wherever analysis of large-scale complex data is useful. For instance, it enables businesses and policy makers to determine trends; it can be used in disease prevention; preventing terrorist attacks; cybersecurity; combatting crime and in the discovery of new scientific knowledge. Interesting areas of current work include algorithmic analyses that prevent terrorist attacks; intelligent intrusion detection; and digital forensics work. These directly feed into our undergraduate provision e.g in modules CET313, CET324, CET304, CET350, CET312, CET240 and CET221.

HCI/UXD research has impact wherever digital technologies are used at a personal level. For instance in education, learning, domestic activity, exercise, promoting secure on-line behaviours in users. Significant work in this strand has focused on improving Usability Evaluation Methods by empirically testing the contribution of usability methods (e.g. Think-aloud testing) to usability problem discovery and analysis. Our research also focuses on studying those factors that influence behaviour with technology, for example, those aspects of design that are related to credibility and trust, that promote behaviour change in the context of healthy living, or safer internet transactions. The usability evaluation research feeds directly into the usability strands that go though each year of the undergraduate degrees and can be seen in the CET300 project, CET233 Software Enterprise Project, CET101 and CET308.

AI/ML research has impact in knowledge-intensive industries. The focus of informatics is on the software components of ICT, information methodologies and aligning IT at systems level with organisations, people and processes. Much of the work in this area is carried out as applied research/ knowledge transfer activity in collaboration with companies, and staff involved in these activities have used case studies in their teaching e.g. in CET313 and CET315.

Given the applied nature of our research Industrial Engagement is key to our activities. For instance our engagement with Sage and Nexus has led directly to the production of teaching materials and case studies for our level 6 UXD students (CET308). Our collaborative research involves over 150 industrial collaborators and informs the design and development of our curriculum.

The fifth strand of our research is Pedagogic Research in Computer Science and this has a hugely important impact on our curriculum delivery. Staff interests and publications in assessment; authenticity in learning, teaching and assessment; student motivation; creativity in HE; student engagement; the Inspiring Teacher; eportfolios; and gamification, to name a few topics, have all contributed to developments in our LTA approaches over recent years.

Moreover, we operate to the institution's Research Active Curriculum commitment. In our assessment planning week each September we discuss and record where each module may

map onto the Healey (2005) model of the research active curriculum, so we have a mix of research based (students undertake enquiry based learning activities), research orientated (we teach the students 'how to research'), research led (our subject-based research is disseminated in the curriculum),

SECTION D: EMPLOYABILITY

36. How will the programme prepare me for employment?

The programme gives you the opportunity to develop skills which you can use in the future. Some skills are more specific than others to the subject area, or to a particular type of activity, but all skills can be applied in a range of employment situations, sometimes in quite unexpected ways. The skills which this programme is designed to develop are listed below.

We aim to ensure our programmes prepare students for employment both through our close ties with business and industry, and through the curricula and the manner in which we facilitate our students' learning.

For every approval/re-approval, we include employers in the development process and consult industrial, PSRB, sector skills and academic staff at appropriate junctures. Staff undertaking industrial placement visits provide feedback from placement companies, and real-world industry-consultative activities like the Stage 2 Software Enterprise Project and Stage 3 Individual Project ensure employer input to our provision.

We have an active Industrial Advisory Board comprising colleagues from international, national and local business including IBM, SAGE, BA, Leighton Group, Accenture, HP, Tombola, Sunderland City Council, Sapphire, Northumbria Police, and CISCO. This provides a forum for discussion that in turn informs the Faculty's syllabi and curricula, thereby enhancing the student experience. The IAB obtains input on employer needs and expectations of graduate and placement student skills and abilities; shares developments in FCS to obtain industrial viewpoints; discusses opportunities for industrial input to the delivery of the curricula through guest lectures, projects, case studies, assessment briefs, prizes and engagement with Sunderland Futures; and discusses opportunities for collaboration in research, reach out and employability matters.

We are represented on local employer groupings including DYNAMO, Digital Leaders North East, the North East Fraud forum as well as the relevant PSRBs. The work undertaken with these groups has developed strong relationships increasing employer input e.g. SAGE and Accenture have worked closely with us in addressing the curriculum and employability skills needs. Colleagues in the Faculty have been part of national working groups on cybersecurity in the CS curriculum and the output from these working groups has been included in the curriculum in CET101, CET233 and the final year specialism in "Advanced Cybersecurity". Two colleagues also contributed to a national project for CPHC (Council of Professors and Heads of Computing) called GECCO – Building a Graduate Employability Community in Computing. https://cphc.ac.uk/2017/08/03/gecco-evaluation-report/ The Faculty initiatives in that project revolved around the Placement Champions and 'Employable Me' projects.

In terms of student skills development, we ensure a wide range of learning activities so that students are adequately prepared to work individually and in teams, on analytical problem

solving, and in practical scenarios of designing/building/testing/evaluating. Computer Science as a field focuses on problem solving and students do this from day one. We integrate colleagues from the Careers and Employability Service into our module delivery, and clear links are made to the activities of Sunderland Futures. Practitioners from business and industry provide research seminars, presentations, demonstrations and master classes to illustrate the opportunities in employment and to inspire students. We also incorporate hackathon type activities into the curriculum. In 2014 we introduced Professional Practice Weeks into the Stage 1 curriculum and from 2017 they have been extended into Stage 2. This underlines the importance of professional behaviour and self-governance in our assessed problem solving contexts. These incorporate programme themed PDP undertaken by programme leaders. Students maintain an e-portfolio of their skills development and keep learning logs to enhance reflective practice. Right from first year we use the HEA Student Employability Profiles as a means of enhancing student preparation for employment. CET232 Personalised Skills Development, CET210 Industrial Placement and CET340 Students into Schools all directly address employability, enhancing student self-determination, planning and actioning, reflection, professional behaviour and real world experience.

Recent graduates of Networks and Cybersecurity are working as Network Engineers or Security Professionals at CISCO, Accenture, Hewlett Packard, BT and Durham University.

For information about other opportunities available to our students who study on campus, click here.

Additional opportunities to develop your experiences more widely will vary if you study at one of our partner colleges. For information about the extra-curricular activities available in any of our colleges please contact the college direct.

37. Particular features of the qualification

The programme will operate under the standard MCS regulations subject to the following addition:

(i) The Level 6 project module, CET300, must be fully included in the top 100 Level 6 credits for the calculation of final degree classification

38. Professional statutory or regulatory body (PSRB) accreditation.

PSRB accreditation is not relevant to this programme	
PSRB accreditation is currently being sought for this programme	
This programme currently has PSRB accreditation	✓

The programme is currently accredited until: for 5 years from the accreditation visit in 2017

The implications of the accreditation not being renewed are: N/A

Please see PSRB Renewal Process for information on the renewal process.

The relevant PSRB(s) is/are: BCS The Chartered Institute for IT

The terms of the accreditation are as follows: BCS for intakes 2018-2021

The programme is recognised as: CITP, CEng (partial fulfilment)

Accreditation gives graduates (status / exemption): CITP, CEng (partial fulfilment)

This depends upon successful completion of the programme.

Is membership of the PSRB dependent on further requirements? N/A

There are programme-specific regulations relating to the following. Details are given in the programme regulations:

The modules to be studied	Project to be passed without compensation
Pass-marks for some or all modules and/or parts (elements) of modules	
Requirements for progression between one Stage and another	
Placement requirements	
Attendance requirements	
Professional practice requirements	
Degree classification	The Level 6 project module, CET300, must be fully included in the top 100 Level 6 credits for the calculation of final degree classification
Other	

Interim or exit awards are not accredited.

SECTION E: PROGRAMME STRUCTURE AND REGULATIONS

Complete and insert Part B of the Programme Regulations Form, for questions 39 and 40

SECTION F: ADMISSIONS, LEARNING ENVIRONMENT AND SUPPORT

41. What are the admissions requirements?

The University's standard admissions requirements can be found in the university regulations. Programme-specific requirements which are in addition to those regulations are given below.

For Stage 1 entry

- At least 2 GCE Advanced Level qualifications (or Advanced Certificate in Vocational Education) and a minimum of 260 UCAS points.

- BTEC Level 3 National Diploma / GNVQ in an appropriate computing/IT discipline and a minimum of 260 UCAS points.

The University's standard admissions requirements can be found in the university regulations. Programme-specific requirements which are in addition to those regulations are given below.

The University's standard admissions requirements can be found in the university regulations. Programme-specific requirements which are in addition to those regulations are given below.

For Stage 1 entry

- At least 2 GCE Advanced Level qualifications (or Advanced Certificate in Vocational Education) and a minimum of 112 UCAS points.

- BTEC Level 3 National Diploma / GNVQ in an appropriate computing/IT discipline and a minimum of 112 UCAS points.

The current entry requirements for this programme is as specified in the Fees and Entry Requirements section on the programme page on the University's website.

Entry from a University of Sunderland Integrated Foundation Year

Any student with 120 credits from the Level 3 Integrated Foundation Year for any of the six computing programmes would be eligible for entry onto stage 1.

42. What kind of support and help will there be?

a. in the faculty

Pastoral Care is taken seriously by the Faculty. At stage 1 there are key staff who teach on the fundamentals module who undertake pastoral care. During the Professional Practice Weeks there are targeted sessions with personal tutors/programme leaders, not only to engender programme-specific professional practice and allow for targeted career sessions but also as checkpoints in student engagement and progression through both face to face discussions and checking of engagement in the construction of the e-portfolio. In addition, at stage 1 there is a level leader who oversees the support of the students. At stages 2 and 3, as with stage 1, the programme leaders and personal tutors are closely involved in the teaching of the students, making for effective monitoring of progress and engagement.

All students have individual access to their Programme (and Module) Leaders on a needs basis and formally timetabled in accordance with the university student support/personal tutoring policy. We also use programme spaces/noticeboards within the VLE, as well as email interaction to provide flexible and efficient communication on day to day issues. Both the VLE and TDS systems allow personal tutors to monitor student engagement and make interventions as appropriate. Programme teams meet with student representatives each term in Staff Student Liaison Committees (SSLCs) in order to formally record issues around the student experience. In many instances, issues can quickly and easily be resolved in this way. In some cases they

need referral to the Boards of Study. In either event, the VLE is used as a mechanism for formally feeding back to the students regarding the resolution or otherwise of the issues raised. Lately we have sought to further empower our student representatives in this process by assigning them the role of taking minutes and publicising in programme spaces.

At stage 2 students are supported by their Programme Leaders and personal tutors, who also form part of the teaching team for that level. In addition, the Placement Module Leader plays a role in readying them for an industrial placement, should they wish to undertake that option, by means of targeted activities during the context teaching sessions of the stage 2 software enterprise project module, through advertising of vacancies on the VLE, arranging employer presentations and visits, on- and off-site interviews, and general liaison with students, staff and employers. We also have an initiative called *Placement Champions* whereby students in final year who have completed their sandwich placement also work with first and second year students to publicise the benefits of undertaking a placement. They do this by contribution to sessions, developing personal profile posters that are displayed in the building and wearing their Placement Champion hoodies as a visible presence in the faculty. Our Careers and Employability Services (CES) link advisor is also an important part of our stage 2 placement preparation, providing information and guidance through presentations and advice on for example CVs and interviews. This person is an integrated member of the Stage 2 personalised skills development and software enterprise project modules, delivering targeted careers development sessions during core module contact time with the students. The Stage 2 personalised skills development and software enterprise project staff are also valuable in helping the students develop more business oriented, client focused and employability skills which again stand them in good stead for securing an industrial placement. Again, several of these staff are also programme leaders. Personalised Skills Development is a new module and aims both at developing students' interest in undertaking the industrial placement and also providing shorter term, alternative career enhancing opportunities for students who for whatever reason decide not to do a placement.

Student support while on the placement is through the module leader and the students' assigned visiting tutor who visits them in their workplace twice during the year and also maintains contact via phone, email and eportfolio. The student is also supported by a workplace supervisor while on placement. Students, tutors and the company supervisor operate within a set of clear guidelines and pertinent advice given in the Placement Module Handbook.

At Stage 3 the same personal tutoring process is in place as previously and in addition the programme leader is in many cases the supervisor for a student's final year dissertation/project, thereby ensuring close contact and support. The project supervisor is always the student's personal tutor.

There is a strong taught element of 'context' running through the programmes which helps ensure students are appropriately orientated to their course of study. In addition, as students can change programme entering stage 2, personal tutors work closely with them in stage 1 to make the correct programme choice. This process is supported by advice sessions with module leaders and students from levels 5 and 6.

Finally, students may seek support from the on-site Faculty Student Liaison Officer and Students Union during their studies.

b. in the university as a whole:
   The University provides a range of professional support services including wellbeing, counselling, disability support, and a Chaplaincy. Click on the links for further information.

c. in a partner college:
Please see the relevant college prospectus or website for details of student support if you are planning to study in one of our partner colleges.

43. What resources will I have access to?

On campus	✓	In a partner college		By distance learning	

On campus

General Teaching and Learning Space	✓
IT	✓
Library	✓
VLE	✓
Laboratory	✓
Studio	
Performance space	
Other specialist	✓
Technical resources	✓

Technical learning resources for the Faculty are supported by dedicated technicians, 3 specifically for FCS and 6 central support technicians. The technicians are managed by the FCS Technical Manager who works very closely with the academic staff to ensure the appropriateness of resources.
Technical learning resources for the Faculty are supported by dedicated technicians, 3 specifically for FCS and 6 central support technicians. The technicians are managed by the FCS Technical Manager who is a member of the Faculty Management Team and who works very closely with the academic staff to ensure the appropriateness of resources.

There is a range of learning resources available to students in FCS subjects. There is a range of learning resources available to students in computing and engineering subjects. Normal access to resources during term time is Mon-Fri 8am-9pm hours, although some specialist facilities have restricted access with academic staff and technical staff managing access to normally locked resources. If specialist labs are free they can be accessed via a signing in procedure available from the IT Helpdesk in DGIC. Available hardware includes the Computing suite in the David Goldman Informatics Centre which is organised into a set of 7 cells each of 25 machines for teaching and an open access suite of 67 units comprises of PCs and MACs. There are a total of 242 workstations (217 PCs and 25 Macs) on the terraces. The specification of these machines are PCs vast majority Intel i3 ranging to intel i7's. In addition there are specialised CISCO and Forensic facilities in 6 laboratories. These contain 125 PCs with Cisco networking kit, PICO cell and virtualisation setups.

These labs cater for Networking, Cybersecurity and Digital Forensics courses. The total number of available seats is thus 375. Cells are available to all students within the University if not timetabled. In DGIC there is a Learning Lab which comprises 7 Smart boards with connecting laptops which is capable of linking all smart boards from one input. We are also trialling the set up of a Problem Based Learning area.

A rolling replacement programme for computing equipment is operated with local (formerly School of CAT) and central funding available for hardware and software upgrades each year. This rolling replacement programme is continuing and we have a 5-year plan in place.

Final year project students have access to a dedicated project room.

Information about the University's facilities can be found here.

Please see the relevant college prospectus or website for details of college learning resources if you are planning to study in one of our partner colleges.

44. Are there any additional costs on top of the fees?

No, but all students buy some study materials such as books and provide their own basic study materials.	✓
Yes (optional) All students buy some study materials such as books and provide their own basic study materials. In addition there are some are additional costs for optional activities associated with the programme (see below)	
Yes (essential) All students buy some study materials such as books and provide their own basic study materials. In addition there are some are essential additional costs associated with the programme (see below)	

45. How are student views represented?

All taught programmes in the University have student representatives for each Stage (year-group) of each programme who meet in a Student-Staff Liaison Committee (SSLC) where they can raise students' views and concerns. The Students' Union and the faculties together provide training for student representatives. SSLCs and focus groups are also used to obtain student feedback on plans for developing existing programmes and designing new ones. Feedback on the programme is obtained every year through module questionnaires and informs the annual review of the programme. Student representatives are also invited to attend Programme and Module Studies Boards which manage the delivery and development of programmes and modules. Faculty Academic Committee, also has student representation in the form of the School Coordinator – a student with a stipended role of liaison between students, student reps and the faculty. This allows students to be involved in higher-level plans for teaching and learning. At university level Students are represented on University level Committees by sabbatical officers who are the elected leaders of the Students' Union. At faculty level we have a student Computing Society which as well as serving the wishes of the student members acts in a liaison role with us.

The University's student representation and feedback policy can be found here.

Final-year students are also invited to complete a National Student Survey (NSS) which asks a standard set of questions across the whole country. The results of this are discussed at Programme Studies Boards and at Faculty Academic Committee to identify good practice which can be shared and problems which need to be addressed. We rely heavily on student input to interpret the results of the NSS and ensure that we make the most appropriate changes. Students who are not in final year feed back via the Survey US mechanism at the same time the NSS takes place.

SECTION G: QUALITY MANAGEMENT

46. National subject benchmarks

The Quality Assurance Agency (QAA) for Higher Education publishes benchmark statements which give guidance as to the skills and knowledge which graduates in various subjects and in certain types of degree are expected to have. These can be found here.

Are there any benchmark statements for this programme?	**YES**	**NO**

The subject benchmark(s) for this programme is/are:

Computing (2015)

There are no benchmarks for this programme.

The QAA also publishes a Framework for Higher Education Qualifications (FHEQ) which defines the generic skills and abilities expected of students who have achieved awards at a given level and with which our programmes align. The FHEQ can be found here.

47. How are the quality and standards of the programme assured?

The programme is managed and quality assured through the University's standard processes. Programmes are overseen by Module and Programme Studies Boards which include student representatives. Each year each module leader provides a brief report on the delivery of the module, identifying strengths and areas for development, and the programme team reviews the programme as a whole. The purpose of this is to ensure that the programme is coherent and up-to-date, with suitable progression from one Stage to another, and a good fit (alignment) between what is taught and how students learn and are assessed - the learning outcomes, content and types of teaching, learning and assessment. Student achievement, including progress between Stages of the programme and degree classification, is kept under review. The programme review report is sent to the Programme Studies Board and the Faculty in turn reports issues to the University's Quality Management Sub-Committee (QMSC).

External examiners are appointed to oversee and advise on the assessment of the programme. They ensure that the standards of the programme are comparable with those of similar programmes elsewhere in the UK and are also involved in the assessment process to make sure that it is fair. They are invited to comment on proposed developments to the programme. Their reports are sent to the Deputy Vice-Chancellor (Academic) as well as to the Faculty so that issues of concern can be addressed.

Appendix 2

All programmes are reviewed by the University on a six-yearly cycle to identify good practice and areas for enhancement. Programmes are revalidated through this review process. These reviews include at least one academic specialist in the subject area concerned from another UK university. Quality Assurance Agency (QAA) review reports for Sunderland can be found here.

Further information about our quality processes can be found here.

Please also complete and insert the SITS form.