

Programme Specification Template - Postgraduate

Please note:

- Guidance notes for staff or suggestions for the design and functionality of the database are in **grey highlight**. **Guidance notes should be deleted in the final version.**

SECTION A: CORE INFORMATION

- | | |
|------------------------------------|--|
| 1. Name of programme: | MSc Computer Networks and Cybersecurity |
| 2. Award title: | MSc in MSc Computer Networks and Cybersecurity
Post Graduate Diploma in Computer Networks and Cybersecurity
Post Graduate Certificate in Computer Networks and Cybersecurity |
| 3. Programme linkage: | Is this part of group of linked programmes between which students can transfer at agreed points? (e.g. a group of programmes with a common set of taught modules)
No |
| 4. Is the programme a top-up only? | No |
| 5. Level of award: | Level 7 |
| 6. Awarding body: | University of Sunderland |
| 7. Department: | Faculty of Computer Science |
| 8. Programme Studies Board: | Computing Postgraduate |
| 9. Programme Leader: | Dr David Nelson |

10. How and where can I study the programme?

Tick all boxes that apply

At Sunderland:	
Full-time on campus	X
Part-time on campus	X
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)	

Free text below to give further brief details (optional) – e.g. that the partner teaches the first part of the programme after which students progress to Sunderland. (Maximum 150 words)

11. How long does the programme take?

	Min number of years / months	Max number of years / months
Full-time	14 months	42 months
Part-time	24 months	72 months
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 college.

SECTION B: FURTHER CORE INFORMATION

Use [Outline Programme Proposal Form for ADC](#), for questions 12 to 23

24. Learning and teaching strategy

The general learning, teaching and assessment strategy used within this programme reflects the Faculty standard for postgraduate taught programmes and embraces the Faculty Learning and Teaching Plan. The fact that the MSc in Computer Networks and Cybersecurity is dealing with graduates and educating them to Masters level means that the students are expected, and have the ability, to carry out a significant quantity of independent study. This may take the form of directed reading of research papers and advanced technical material, applied practical work utilising the tools and techniques design, deploy, secure and test network devices, protocols and services.

The programme is designed to enable students to learn about the principles, theories, standards, policies and procedures associated with networking and cybersecurity and to apply these in a series of practical, exciting and innovative ways. Extensive use is made of a wide range of networking software and hardware. The programme encourages students to learn from leading researchers and practitioners in cybersecurity and as such lectures are underpinned with the opportunity to solve real world cybersecurity, resilience and continuity problems. Where possible these will be set from industrial and business contexts and case studies.

The case studies will be derived from collaborative partnerships from public and private sectors, for example from the (ISC)², Accenture, HPE, BT, PWC, SAGE, SRM, Net Defence, Sapphire, Sunderland City Council, Northumbria and Durham Police forces and the Cybersecurity Workforce Alliance, taking into account appropriate clearance, government agencies and organisations.

The intention is to give students an environment to:

- Learn about the devices protocols and services that support modern networks
- Explore, critically analyse and understand cybersecurity and related issues;
- Explore network design strategies that will provide businesses with robust, secure and flexible network services.
- Prepare students for career development in the networking and cybersecurity domain.

Negotiated learning is used within the project module of this programme. The negotiation will centre on the terms of reference that the student wishes to propose. A central objective within the terms of reference of PROM02 will be the delivery of the product or artefact required by the client. However, the route by which this is achieved, and the topic and scope of the research that will interlink with it, are decided under negotiation between the student and supervisor (these decisions will be ratified during formal project reviews).

The cybersecurity provision is underpinned by strong collaboration with employers. The provision is further enhanced by the contribution from cybersecurity employers and external experts in a number of ways including, although not limited to, a series of guest lectures, master classes and seminars. The

external input provides a range of different perspectives and helps to maintain the currency of the programme.

As indicated in sections 28 and 32 of this document, the MSc in Computer Networks and Cybersecurity is heavily influenced by the research interests of the academics involved in the delivery of the modules. The MSc in Computer Networks and Cybersecurity utilises the “research active curriculum” which enables MSc students to benefit from research in the Faculty and participate as researchers as an integral part of their studies.

25. Retention strategy

Support and guidance is offered to students through a comprehensive set of mechanisms in order to address retention. In addition to the details provided in the student support section retention on the MSc Computer Networks and Cybersecurity programme will be addressed via student support and guidance, access to programme leader, module leaders, and personal tutors, during induction, via programme information (programme handbook), and access to student services and pastoral support.

All students have access to their Programme and Module Leaders as appointments can be made with staff. Students’ problems generally will be dealt with through the Programme Leader. The students also have representation on the Boards of Studies and the Staff Student Liaison Committees. Programme Leaders meet regularly with their tutees to take soundings and obtain feedback on various issues, and to talk to students individually to provide important academic guidance.

All students have access to a personal tutor. At postgraduate level the students’ personal tutor is their programme leader. Students can request to speak to their programme leader in confidence regarding any personal issues. In the case where a student, for example, would feel uncomfortable speaking with their programme leader (for example a female student may wish to speak with a female member of staff) then the programme leader will attempt to arrange for the student requests to be met as soon as possible.

All on-campus students have access to the University’s central support services including Counselling, Disability Service, Health and Well-being, Chaplaincy, financial support and advice, International Office and Careers and Employability Service. The Students’ Union provides an independent service which offers advice and support across the full range of personal and academic problems which students may encounter. Students wishing to lodge a complaint or an appeal can seek advice from the Students’ Union or from Academic Services. Full details of all these services can be found on the University’s web-site. Where appropriate, academic or support staff in the Faculty will sign-post students to these specialist services.

26. Any other information

The programme has been designed to incorporate the University’s principles and expectations of “inclusive programme design” in particular taking into account the requirements and availability of learning materials in hard copy / printed copy and online (taking into account W3C standards) – alternative formats will be signposted. All teaching and learning activities (see below) are designed to be inclusive by anticipating the most common problems that students with wide ranging levels of abilities may face. The teaching on the programme will embrace the principles of inclusive design for example by making whole module sets of material available in advance for students, use of vocabulary lists, facilitating recording of sessions, etc. The resources to be used on the programme comply with disability access requirements for University buildings – mainly in David Goldman Informatics Centre.

The Faculty of Computer Science utilises centralised disability support services to assess all students who require support on an individual basis. This is to ensure that appropriate support is identified and that a schedule is implemented to provide that support as necessary.

SECTION C: TEACHING AND LEARNING

27. What is the programme about?

The aims of the programme are to:

Provide you with advanced knowledge of networking and cybersecurity topics. Specialist areas including routing, switching, wireless networking, virtualisation and cloud based networking. The programme also covers real time communication strategies, quality of service and quality of experience

Provide you with advanced knowledge of cyber threats facing networks and strategies used to mitigate them. Network security is a key theme that underpins each module.

Develop your research skills applicable to a career as a networking and cybersecurity professional in industry or business or academia.

28. What will I know or be able to do at the end of the programme?

Learning Outcomes Postgraduate Certificate – Skills

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

- **S1** Independently and objectively, critically review, consolidate and extend their knowledge to produce a systematic and coherent body of information
- **S2** The ability to work independently and make objective decisions relating to complex problems

Learning Outcomes Postgraduate Certificate – Knowledge

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

- **K1** A thorough appraisal and understanding of the current methods and concepts at the forefront of the academic discipline
- **K2** A thorough critical understanding of a key aspect of the academic discipline
- **K3** A critical understanding of the application of appropriate research techniques

Learning Outcomes Postgraduate Diploma – Skills

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

- **S3** The ability to deploy and test a range of network services across an existing network infrastructure.
- **S4** The ability to design a complex network system that integrates a range of technologies, protocols and services.
- **S5** The ability to create a complex network system that integrates a range of technologies, protocols and services from design documentation.
- **S6** The ability to assess network security risks and select, deploy and test suitable security protocols and technologies to protect network services.

Learning Outcomes Postgraduate Diploma – Knowledge

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

- **K4** A comprehensive understanding of the core protocols and technologies that are essential elements of network infrastructure.
- **K5** A comprehensive understanding of the core protocols and services that are an essential element of a client/server network
- **K6** A critical understanding of the advanced technologies and protocols used to implement a variety of specialist network services.
- **K7** Knowledge of the techno economic issues relating to Network Systems, including the use of virtualisation and cloud services to reduce costs and extend services.
- **K8** A critical understanding of network design practises.

Learning Outcomes Masters – Skills

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

- **S7** Design and undertake independently, a major original research project on a topic which relates to the forefront of the academic discipline of network systems and reflect extensively and objectively on method, process and outcomes.
- **S8** Independently conduct research or advanced technical or professional activity in the area of network systems demonstrating self-direction and originality in tackling and solving problems, and critically evaluate sources
- **S9** Deal with complex issues in network systems both systematically and creatively, make informed judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences.

Learning Outcomes Masters – Knowledge

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

- **K9** An understanding and critical awareness of project management concepts and techniques, including the use of advanced tools for the management of projects.
- **K10** Advanced knowledge in a highly specialised area in the discipline of network systems, via an individual project.

29. What will the programme consist of?

Taught postgraduate programmes generally consist of a number of taught modules leading to the award of a Postgraduate Certificate (60 credits) or Postgraduate Diploma (120 credits). A Masters qualification (180 credits) usually culminates in a major piece of independent work such as a project or dissertation. All modules are at postgraduate level (level 7 in the UK's national scheme). The summary below describes briefly what is contained in the programme. The programme structure, including a detailed list of modules, can be found in the [programme regulations](#).

The Masters in Computer Networks and Cybersecurity provides you with a thorough grounding in the design and deployment of complex networks and the secure network services that business require. The programme examines the security issues surrounding the operation of computer networks and provides you with the skills and knowledge necessary to protect the network. You will have the opportunity to examine the underlying technologies of secure systems and develop a critical awareness of the inherent risks and related privacy issues of their use. You will have the opportunity to learn how to select the appropriate tools and techniques to address and manage concepts of risk; threats, vulnerabilities and potential attacks

CETM30 Fundamentals of Cybersecurity. In this 30 credit module students will cover a range of governance and management topics which will enable students to determine, establish and maintain appropriate governance of, delivery of and creation of cybersecurity solutions for information security, systems security and network security. Students will be able to show a comprehensive understanding of the underlying technologies of secure systems and a critical awareness of the inherent risks and related privacy issues of their use in the cybersecurity environment by applying concepts such as the principle of least privilege, principle of separation of risk, defence in depth and secrecy. Students will learn to analyse the range of trade-offs in balancing the security properties of confidentiality, integrity and availability (CIA) and the usability demands of computer and information systems. They will have the opportunity to learn how to select the appropriate tools and techniques to address and manage concepts of risk, threats, vulnerabilities and potential attacks. Students will be able to explain, apply and evaluate the concepts of trust and trustworthiness in a cybersecurity context and explain and apply the issues associated with authentication, authorisation and access control.

CITM15 Network Infrastructure. This 30 credit module examines the role of the networking devices that make up the infrastructure of a large multi-site network. The module will focus primarily on routers, switches and wireless LAN devices. It will also examine the role of key network support protocols and services that would be needed to operate these devices. This would include network addressing protocols such as IPv4 and IPv6, interior and exterior routing protocols such as OSPF and BGP and lesser protocols that provide specific network services such as NAT and STP. Protocol vulnerabilities and mitigation strategies will also be examined. Students will be expected to build, test and evaluate prototype networks in their tutorial sessions

CETM48 Secure Network Design. This 30 credit module examines the security issues facing today's networks and examines a range of network design strategies that may be used to mitigate these issues whilst also providing a business with a scalable, cost effective and flexible network solution. This will involve an extensive in-depth examination of current network security issues and solutions along with a range of advanced protocols and network technologies. Students will

also learn how to assess the functionality of an existing network and recommend strategies that may be used to improve its performance, level of fitness and security

CETM49 Network Service Provision. The 30 credit module critically examines the advanced network services that organisations are now using to support their business goals. The module will focus primarily on converged voice and video communication strategies that are supported by cloud and virtualisation solutions. Students will learn how to design, deploy and evaluate a range of network services and will examine the benefits, challenges and security issues surrounding these services. Students will learn to analyse the range of trade-offs in balancing the security properties of confidentiality, integrity and availability (CIA) with the speed and flexibility of such information systems to meet the needs of a dynamic organisation. They will have the opportunity to learn how to select the appropriate tools and techniques to address the needs of a range of such organisations whilst maintaining security and service availability.

Students who pass 60 credits may be eligible for PG Cert provided that they pass either CETM30 (Fundamentals of Cybersecurity) or CITM15 Network Infrastructure. Students who pass an additional 60 credits from the taught modules are then eligible for a Postgraduate Diploma in Computer Networks and Cybersecurity.

The final part of the MSc programme consists of a 60-credit project module PROM02. In this module the student will develop a practical deliverable as well as investigate an area of academic research that informs the practical aspect of the project. Wherever possible the project will have a real client, who may come from either inside or outside of the institution and has a need for a real practical deliverable in the domain of Computer Networking and cybersecurity.

PG Cert, PG Diploma and MSc requirements are summarised in the table below. Full detail of module name and assessment are available in the appendices.

Post Graduate Certificate in Computer Networks and Cybersecurity	To obtain PG Certificate students need to pass 2 modules from CITM15, CETM30, CETM48, CETM49 (which must include at least one of CITM15 or CETM30)
Post Graduate Diploma in Computer Networks and Cybersecurity	To obtain PG Diploma students need to pass all taught modules, i.e. CITM15, CETM30, CETM48, CETM49
MSc in Computer Networks and Cybersecurity	To obtain MSc students need to pass all modules for PG Diploma and also the 60 credit project module PROM02

30. How will I be taught?

Scheduled teaching activities	X
Independent study	X
Placement	

Students will be given the opportunity to study the range of networking and cybersecurity subjects using a variety of different teaching and learning approaches. The topics in the various modules will normally be introduced through a series of lectures led by academics who are active researchers in the subject matter and supported by guest lecturers from business and industry.

The topics in the programme will normally include an examination of the theoretical aspects of the range of topics followed on with applied and practical activities.

The objective of the students-staff time in lectures is to introduce theories, concepts case studies and scenarios and to set milestones and learning goals, and make new ideas and concepts accessible to the students. These ideas are then followed up in tutorials and in the students' own time. Tutorials / seminars and laboratory activities are used within each module to provide support for lectures – giving students the opportunity to apply theoretical concepts to practical problems. The prime objectives of tutorial time are to allow in depth study of particular topics that have been introduced and also for practical exercises. As well as requiring a significant amount of individual study, the course also encourages group working. This is in recognition of the fact that a graduate of the course will normally be employed in environments where significant demands will be made upon his or her ability to co-operate and collaborate with others. To that end, students will have the opportunity to design, build, test and evaluate complex networks that utilise both wired and wireless technology in the Faculty's well stocked laboratories.

Students will have the opportunity to examine and evaluate the environment of cybercrime and cyberthreat at individual, organisational and national level and as such the need and rationale for cybersecurity. Students will develop skills in a range of topics including security management, operational security management, risk management and threat evaluation, business resilience and continuity, development of policies and procedures in cybersecurity, and a range of tools and techniques in information security, systems security and network security.

All of the subjects and modules in the programme are aimed at developing networking and cybersecurity professionals who understand the professional requirements and issues of the various roles in networking and cybersecurity and are able to evaluate relevant issues, challenges and opportunities taking into account legal, social and ethical considerations and requirements. Students will also learn how to balance security concerns against ease of access and network scalability, flexibility and performance requirements.

In addition students are expected, and have the ability, to carry out a significant quantity of independent study. Students will be supported in developing the skills to do this for example in CITM15 'Network Infrastructure' and CETM30 'Cybersecurity Fundamentals'. This may take the form of directed reading of research papers and advanced technical material, research activities, or practical work on various software problems and packages. The level of independence increases throughout the programme culminating in the project module, PROM02, where students have the opportunity to demonstrate knowledge and skills from the taught modules and take them to a higher level.

As well as developing skills and abilities in the domain of networking and cybersecurity, students will have the opportunity to develop Masters level skills, including, but not limited to: research skills (across all modules); gathering and using information; synthesising information/data; applying methodologies; applying concepts; creating new concepts/ideas/products; analysing and evaluating; critical reasoning, and information retrieval skills.

The professional body (British Computer Society) expectations are embedded throughout the programme – which will help with any students seeking to develop their careers by obtaining chartered status (CITP or CEng).

A list of the modules in 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](#).

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

Written examinations	
Coursework	X
Practical assessments	X

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](#).

The assessment throughout this programme is a mixture of methods appropriate to the modules under study. Each assessed 30 credit module will typically have two assessments.

The students experience a diverse range of assessment strategies across the programme, enabling them to display various skills associated with Masters level learning. This will include research papers, creation of networking and cybersecurity solutions (design, implementation, evaluation and maintenance), analysis of cybersecurity problems, threats and challenges, application of networking tools and techniques, creation of policies and procedures for cybersecurity, formal paper reviews, and presentations. The assessment strategies chosen within each module are appropriate to the content and style of delivery and have been further selected in order to provide a rich mixture of diverse assessment strategies while ensuring that the module aims and objectives can be accurately assessed.

Individual assignments include different forms of assessment strategies. The module CITM15 Network Infrastructure includes two assessments that require the student to research the effectiveness of a set of communication protocols and build and evaluate their operation in test networks. The module CETM48 Secure Network Design contains both a time constrained practical assessment and a written technical report.

Every attempt is made to ensure that the assessments are based on real world problems and challenges, with assessment briefs being developed in collaboration with industrial and business partners where appropriate and as such have relevance to employers and help develop employability criteria for students. For example the module CETM30 Fundamentals of Cybersecurity includes two assessments both of which require students to analyse case studies.

The project module PROM02 encompasses a wide range of assessment styles whereby students produce a practical deliverable for a real client, a substantial and methodical research report which

informs development of the practical deliverable and which must be relevant to the programme, a thorough evaluation of all stages of the project, and documentation evidencing project management and control of a substantial project.

The University aims to return marked assessments and feedback within 4 working weeks of the assignment submission date after internal moderation process have been completed. If this is not possible, students will be notified by the Module Leaders when the feedback is available and how it can be obtained.

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 assessment and the implications of an allegation of academic misconduct.

Students should refer to the [University Regulations](#) for information on degree classifications.

32. Teaching, learning and assessment matrix

Matrix of modes of teaching, learning and assessment - MSc

NB Text in the table below is an example. You will need some means of cross-referring to each of the learning outcomes (LO) specified for the programme. Here they are labelled LO / S (for skills) / 1, 2 etc.; LO / K (for knowledge) / 1, 2 etc. but you do not need to follow that approach. One matrix sheet must be completed for each stage of the programme.

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.

Module	Code	Core / optional	Modes of T&L	Modes of Assessment	LO S1	LO S2	LO S3	LO S4	LO S5	LO S6	LO S7	LO S8	LO S9
Cybersecurity Fundamentals	CETM30	Core	Lectures, Seminars, Tutorials, Self-study	Coursework	Taught Developed Assessed	Taught Developed Assessed				Taught Developed	Taught Developed		Taught Developed Assessed
Network Infrastructure	CITM15	Core	Lectures, Seminars, Tutorials, Self-study	Coursework Practical	Taught Developed Assessed	Taught Developed Assessed	Developed		Developed				
Secure Network Design.	CETM48	Core	Lectures, Seminars, Tutorials, Self-study	Coursework practical	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed			
Network Service Provision	CETM49	Core	Lectures, Seminars, Tutorials, Self-study	Coursework Practical	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed				
Computing Masters Project	PROM02	Core	Lectures, Seminars, Tutorials, Self-study	Coursework	Assessed						Taught Assessed	Taught Developed Assessed	Taught Assessed

Module	Code	Core / optional	Modes of T&L	Modes of Assessment	LO K1	LO K2	LO K3	LO K4	LO K5	LO K6	LO K7	LO K8	LO K9	Lo K10
Cybersecurity Fundamentals	CETM30	Core	Lectures, Seminars, Tutorials, Self-study	Coursework	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed						Taught Developed Assessed	Taught Developed Assessed
Network Infrastructure	CITM15	Core			Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed		Taught Developed Assessed	Developed			
Secure Network Design.	CETM48	Core			Taught Developed Assessed	Taught Developed Assessed				Taught Developed Assessed	Developed	Taught Developed Assessed		
Network Service Provision	CETM49	Core	Lectures, Seminars, Tutorials, Self-study	Coursework	Taught Developed Assessed	Developed								
Computing Master's Project	PROM02	Core	Lectures, Tutorials, Self Study	Coursework	Assessed	Developed	Taught Developed			Assessed			Taught Assessed	Taught Assessed

Matrix of modes of teaching, learning and assessment – PG Diploma

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.

Module	Code	Core / optional	Modes of T&L	Modes of Assessment	LO S1	LO S2	LO S3	LO S4	LO S5	LO S6	LO S7	LO S8	LO S9
Cybersecurity Fundamentals	CETM30	Core	Lectures, Seminars, Tutorials, Self-study	Coursework	Taught Developed Assessed	Taught Developed Assessed				Taught Developed	Taught Developed		Taught Developed Assessed
Network Infrastructure	CITM15	Core	Lectures, Seminars, Tutorials, Self-study	Coursework Practical	Taught Developed Assessed	Taught Developed Assessed	Developed		Developed				
Secure Network Design.	CETM48	Core	Lectures, Seminars, Tutorials, Self-study	Coursework practical	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed			
Network Service Provision	CETM49	Core	Lectures, Seminars, Tutorials, Self-study	Coursework Practical	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed				

Module	Code	Core / optional	Modes of T&L	Modes of Assessment	LO K1	LO K2	LO K3	LO K4	LO K5	LO K6	LO K7	LO K8	LO K9	Lo K10
Cybersecurity Fundamentals	CETM30	Core	Lectures, Seminars, Tutorials, Self-study	Coursework	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed						Taught Developed Assessed	Taught Developed Assessed
Network Infrastructure	CITM15	Core			Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed		Taught Developed Assessed	Developed			
Secure Network Design.	CETM48	Core			Taught Developed Assessed	Taught Developed Assessed				Taught Developed Assessed	Developed	Taught Developed Assessed		
Network Service Provision	CETM49	Core	Lectures, Seminars, Tutorials, Self-study	Coursework	Taught Developed Assessed	Developed								

Matrix of modes of teaching, learning and assessment – PG Certificate

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

Module	Code	Core / optional	Modes of T&L	Modes of Assessment	LO S1	LO S2	LO S3	LO S4	LO S5	LO S6	LO S7	LO S8	LO S9
Cybersecurity Fundamentals	CETM30	Option	Lectures, Seminars, Tutorials, Self-study	Coursework	Taught Developed Assessed	Taught Developed Assessed				Taught Developed	Taught Developed		Taught Developed Assessed
Network Infrastructure	CITM15	Option	Lectures, Seminars, Tutorials, Self-study	Coursework Practical	Taught Developed Assessed	Taught Developed Assessed	Developed		Developed				
Secure Network Design.	CETM48	Option	Lectures, Seminars, Tutorials, Self-study	Coursework practical	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed			
Network Service Provision	CETM49	Option	Lectures, Seminars, Tutorials, Self-study	Coursework Practical	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed				

Module	Code	Core / optional	Modes of T&L	Modes of Assessment	LO K1	LO K2	LO K3	LO K4	LO K5	LO K6	LO K7	LO K8	LO K9	Lo K10
Cybersecurity Fundamentals	CETM30	Option	Lectures, Seminars, Tutorials, Self-study	Coursework	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed						Taught Developed Assessed	Taught Developed Assessed
Network Infrastructure	CITM15	Option			Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed	Taught Developed Assessed		Taught Developed Assessed	Developed			
Secure Network Design.	CETM48	Option			Taught Developed Assessed	Taught Developed Assessed				Taught Developed Assessed	Developed	Taught Developed Assessed		
Network Service Provision	CETM49	Option	Lectures, Seminars, Tutorials, Self-study	Coursework	Taught Developed Assessed	Developed								

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

33. How does research influence the programme?

The Faculty of Computer Science is committed to the close coupling of research and teaching activities so that our research underpins the teaching we deliver. 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 the rapidly developing field of networking and cybersecurity.

The MSc programme in Computer Networks and Cybersecurity is heavily influenced by the research interests of the academics involved in the delivery of the modules. Many of the academics who are designated module leaders were returned in the most recent REF. Academic expertise in cybersecurity, digital forensics, information governance and network systems are embedded throughout the modules on the programme and underpin the learning outcomes of the MSc. Current research projects will be utilised to provide case studies and examples in the research active curriculum. Research specialisms and interests from colleagues in the faculty teaching on the programme include (but are not limited to): novel techniques for managing and discovering knowledge in cybersecurity; using cybersecurity to counter cybercrime and cyber-attacks; information security management; development of policies and procedures for cybersecurity; use of digital forensics to analyse security breaches; wireless tracking. Examples of current projects include implementation of Cyber Essentials; raising employer and employee awareness in cybersecurity; development of cybersecurity policies and procedures in SMEs; gender issues in cybersecurity; identification of breaches using forensic techniques, evaluation of CISP; and pedagogic research looking at PBL in cybersecurity.

The MSc in Computer Networks and Cybersecurity is heavily influenced by research both in terms of inclusion of research interests of academic staff and collaborative projects with industrial partners. The Faculty has a strong track record of Knowledge Transfer Partnerships as a means of formalising applied research.

Cybersecurity is one of the key research strands in the Faculty of Computer Science (along with Data Science, AI/Machine Learning, HCI/UXD and pedagogy in Computer Science) and as such has an active research group which includes 2 professors and 6 active researchers. Colleagues in the Faculty are involved in a number of collaborative projects with public and private business and industry. Students will have the opportunity to engage with the research projects.

Colleagues in the Faculty are involved in a number of external cybersecurity activities and organisations including work with DYNAMO North East, CyberNorth, North East Fraud Forum, (ISC)², and national standards development. Experience from participation and collaboration with these groups will be integrated into the curriculum providing examples and case studies as well as informing the curriculum.

We have a proud history of direct involvement from our students within our research activities. Masters projects are actively sourced from research areas in the Faculty and the University and recent publications have featured project work undertaken by students who have been included as named authors. Students have the opportunity to develop their research skills in a number of ways including as researchers through student led seminars, applying research (PROM02) and becoming part of the research community in the Faculty. Students will have the opportunity to participate in the Faculty's Research Seminar Series where one of the most active strands of the series focuses on cybersecurity.

SECTION D EMPLOYABILITY

34. How will the programme prepare me for employment?

The programme gives you the opportunity to develop advanced skills and knowledge which you can use in the future. Some postgraduate programmes are associated with a particular career path but most skills can be applied to a range of employment situations. The skills which this programme is designed to develop are listed below.

Work with CyberNorth, DYNAMO North East and individual employers including, BT, PWC, Net Defence, HPE, Sapphire and SRM indicate there are local, national and international skills gaps in cybersecurity, and demand is likely to grow.

Colleagues from the Faculty have been members of a national project bringing together academics, industry providers, professional bodies and employers. One of the outputs from the project is a report from (ISC)² / CPHC “Cybersecurity Principles and Learning Outcomes”. The findings in this report suggest there is significant demand for specialist cybersecurity graduates and currently there are a number of employability issues including;

- 6% of the cybersecurity workforce in the UK is under 30;
- by 2020 globally there will be a shortfall of 1.5 million cybersecurity jobs;
- in the UK there are currently 62% too few InfoSec professionals;
- less than 10% of cybersecurity professionals are female;
- 57% of employers can't find graduates with the right mix of cybersecurity skills.

In 2016 the Government has developed strategies for the employment of cybersecurity in the private, public and not for profit sectors, but also in the fight back against the attackers.

The programme is a blend of theory, research informed curriculum, applied practice and problem based learning which go together to address the employability needs and skills gap issues.

There is strong employer input to the curriculum design and the delivery of the modules – with employers being consulted on curriculum content and skills required for cybersecurity employment. Employers provide a valuable resource in terms of guest lectures, master classes and problem setting for the programme.

The growth of cyber threats to individuals, businesses, organisations and governments are increasing at an unprecedented rate. Feedback from employers suggest that there is a significant skills gap in cybersecurity – there is a need for skilled professionals to address the needs and requirements of the industry in designing, implementing and maintaining cybersecurity solutions. The MSc seeks to develop graduates who will become proficient cybersecurity professionals with the technical knowledge base and skills set to master the complex problems and complex requirements in cybersecurity. The programme will enable graduates to utilise the constantly changing and evolving modern technologies that continuously reshape the way digital interaction and communication takes place. Recent government reports such as ***UK Commission for Employment and Skills (2013)*** suggests that the digital sector will require nearly 300,000 new recruits by 2020 and one of the key findings in the report suggests that specialist demand will include “high level IT specialisms, such as IT Architects, Data and **Security** specialists”.

The Faculty of Computer Science works closely with the University's central Careers and Employability Service to ensure that students have access to career opportunities, specialist talks and support and guidance for career development. For full time students there is a commitment to supporting students in their progression from education to work. For part time students support is given to help with career development and career progression. The Careers and Employability Service is located in the Gateway, an impressive, newly-renovated facility in the centre of the City Campus.

There are also opportunities for on-campus students outside your programme of study. Where applicable add text about any extra-curricular activities or opportunities provided by the faculty / department to support students' general development, their integration as a cohort, career planning etc.

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.

35. Particular features of the qualification. (optional)

This describes key features relevant to employability and will be reproduced in the HEAR. If any of the following features apply to all students who achieve this award, please describe them briefly below: placement, professional practice element, key programme specific regulations, professional body accreditation.

For example: "Graduates of this programme will have undertaken a minimum of 80 hours in professional practice. Completion of this programme entitles the graduate to Associate Membership of the Origami Council." (Maximum 150 words)

36. Professional statutory or regulatory body (PSRB) accreditation. Choose one of the following.

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

The programme is currently accredited until: 202

The implications of the accreditation not being renewed are:

Please see [PSRB Renewal Process](#) for information on the renewal process.

The relevant PSRB(s) is/are:

British Computer Society

The terms of the accreditation are as follows:

- Students must complete their programme of study within six years.
- Students must have completed the entire programme at the University of Sunderland.

The programme is recognised as:

Partially meeting the requirement for Chartered IT Professional

The programme is accredited dependent on

Successful completion of 180 masters credits

This depends upon successful completion of the programme.

Is membership of the PSRB dependent on further requirements? No

There are no programme-specific regulations relating to this award.

The modules to be studied	n/a
Pass-marks for some or all modules and/or parts (elements) of modules	n/a
Placement requirements	n/a
Attendance requirements	n/a
Professional practice requirements	n/a
Final or overall mark for the award	n/a
Other	n/a

Interim or exit awards are not accredited.

Free text for description which is not covered by the options above.

(Maximum 50 words)

Repeat if necessary for more than one PSRB

SECTION E: PROGRAMME STRUCTURE AND REGULATIONS

See Appendix 1.

SECTION F: ADMISSIONS, LEARNING ENVIRONMENT AND SUPPORT

40. What are the admissions requirements?

Entry point (delete those not required)	Standard entry requirements ¹	Entry with advanced standing ²	Other ³
Level 7 (Masters awards) – start of programme	An honours degree (2:2 or above) or equivalent in a computing or related non-computing discipline (mathematics, statistics, engineering)	Not applicable	Students who have 5 years relevant industry experience
Level 7 (Masters awards) – after Certificate	Not applicable	Not applicable	
Level 7 (Masters awards) – after Diploma	Not applicable	Not applicable	

Applicants whose first language is other than English must fulfil the University's minimum language skills requirement through one of the accepted mechanisms.

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.
(Maximum 100 words)

Can students enter with advanced standing?	Yes	No
--	------------	-----------

The University has a process by which applicants whose experience to date already covers one or more modules of the programme they are applying for may seek Accreditation of Prior Learning (APL). Full details can be found [here](#) but if you think that this may be relevant to you, please contact the department which offers the programme you are interested in.

APL and APEL are not normally applied in this programme.

- 41.** What kind of support and help will there be?
a. in the department:

The overall strategy for support and guidance is three-pronged: accessibility to staff and resources; provision of relevant and reliable information; and operation of a responsive system for managing problems as they arise.

Support and guidance is offered to students through a comprehensive set of mechanisms. All new students are given a week-long induction programme during which time they are exposed to various aspects of student academic life and much information on the University and its Services, the Faculty of Computer Science and their chosen programme of study. They are provided with programme information, talks by programme and module staff, library visits, talks by representatives from a number of important student services such as the International Office and the University language Scheme including English for Academic Purposes for students whose first language is not English.

All students have access to their Programme and Module Leaders as appointments can be made with staff. Students' problems generally will be dealt with through the Programme Leader. The students also have representation on the Boards of Studies and the Staff Student Consultative Committees. Programme Leaders meet regularly with their tutees to take soundings and obtain feedback on various issues, and to talk to students individually to provide important academic guidance.

Library facilities for students are provided across both campuses and offer an innovative learning environment, an electronic environment which offers access to online resources, the campus network and the Internet, and areas for group and individual study. A summary of the major features of the Web provision, which will be available to the students, is given below:

- complete staff list, telephone numbers, Email addresses and module responsibilities;
- complete list of Faculty of Computer Science programmes, modules with links to programme structures and module descriptors;
- generic student handbook including links to Faculty home pages, University sites e.g. Student Services, Careers, Information Services, Campus maps and various Faculty and University policy documents e.g. rules on infringement, the Modular Credit Scheme and Teaching & Learning policies;
- health & Safety advice;
- the use of Canvas (on-line learning environment) to act as a student support and feedback mechanism.

All students have access to a personal tutor. At postgraduate level the students' personal tutor is normally their programme leader. Students can request to speak to their programme leader in confidence regarding any personal issues. In the case where a student for example would feel uncomfortable speaking with their programme leader (for example a female student may wish to speak with a female member of staff) then the programme leader will attempt to arrange for the student requests to be met as soon as possible.

for careers guidance through the programme / department. (Maximum 500 words)

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.

42. What resources will I have access to?

On campus	X	In a partner college		By distance learning	
-----------	---	----------------------	--	----------------------	--

On campus

Tick all that apply

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

In terms of our teaching staff, the module leaders have been chosen with regard to their expertise in the subject area and in many cases they, and their teaching team, are working on relevant research and/or external engagement projects. This enables staff to practice research informed teaching thus providing students with an appreciation of relevant research themes, an idea of where and how the subject is developing in the future and, in many cases, "real world" case studies. External speakers are solicited from collaborating companies and our own recent graduates in order to provide students with access to relevant practitioners who can provide industrial context.

The Faculty makes full use of the University's Virtual Learning Environment (Canvas) and our strategy is for every module and programme to have an online presence. Key features of our current provision include:

- complete staff list, telephone numbers, Email addresses and module responsibilities;
- complete list of Faculty modules with links to detailed module descriptors and, in many cases on-line learning resources;
- general student handbook including links to Faculty home pages, University sites e.g. Student Services, Careers and Employability Service, Information Services, Campus maps and various Faculty and University policy documents e.g. rules on cheating and collusion, the Modular Credit Scheme and Teaching & Learning policies;
- Faculty Programme/Module timetables;

- Faculty Standards;
- A Code of Conduct for Use of the Computing Terraces;
- Health and safety advice;
- Information about the Faculty's research activities.

Library facilities available at St Peters include a dedicated computing subject collection, a comprehensive range of electronic resources, open access areas for group and individual study, and dissertations / research working papers from the Faculty are also housed in the library.

Specialist Resources

All students in the Faculty are provided with access to one of the most modern and best equipped computing environments in the UK. The David Goldman Informatics Centre features an open plan area made up of terraces which contain nearly 250 workstations comprising PCs. The computers on the terraces are installed with all the necessary software packages required and are normally available to the students on an open access basis 7:00am until 9:00pm weekdays. 24 hour computing facilities are available at the Murray Library.

The faculty also has several purpose build networking laboratories that contain a range of up-to-date networking hardware. This, along with industry standard network simulation software is used to support tutorial activities. It can also be booked by students outside of normal tutorial time.

In support of independent study, students are provided access to the Internet for their smartphones, tablets and laptops via a university wide wireless network. A range of free software is also made available to students through volume licensing with partners such as Adobe, Symantec, Microsoft and Cisco.

The Enterprise Place is supported by the Sunderland Software City initiative and provides dedicated rooming and facilities to host entrepreneurial activities in networking and Cybersecurity. Students with business ideas can become resident in Enterprise Place as they attempt to grow from ideas on how to exploit networking opportunities to fully formed businesses.

Information about the University's facilities can be found [here](#).

43. 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.	X
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)	

44. How are student views represented?

All taught programmes in the University have student representatives for 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 your programme is

obtained every year through module questionnaires and informs the annual review of your 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. This allows students to be involved in higher-level plans for teaching and learning. At university level on Students are represented on University level Committed by sabbatical officers who are the elected leaders of the Students' Union.

The University's student representation and feedback policy can be found [here](#).

Every year we participate in the national Postgraduate Taught Experience Survey (PTES).

SECTION G: QUALITY MANAGEMENT

45. National subject benchmarks

The Quality Assurance Agency 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. They do not cover all subjects at postgraduate level but those which exist can be found at [here](#).

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

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

Masters Computing Benchmark

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](#).

A table mapping the programme learning outcomes against the QAA benchmark for Computing Master's courses can be found in Appendix 4.

46. 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 through the programme, 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 through the programme and the way in which the final award is made, 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.

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](#).

See Appendix 2.

Quality Handbook



Programme Specific Regulation/s

PART A – *not to be included in programme Specification*

Faculty: Computer Science

Programme Award and Title: MSc Computer Networks and Cybersecurity

Programme Leader: Dr David Nelson

Rationale for attached Programme Specific regulation: n/a

Approval Process - as part of a university event

Action	Approval	Date
Considered by the Programme Studies Board:		
Approved by Faculty Academic Committee:		
Programme Leader attach PART B only as appendix to the Programme Specification in event documentation and also send this complete form to Quality Support		
Quality Support send to DVC (Academic)		
Approved by DVC, on behalf of Academic Board		
Quality Support checked ; a) copy of document returned to faculty b) copy of document kept on file c) copy sent to Quality Management Sub-Committee QMSC for note		a) b) c)

Approval Process - when *not part of a university event*

Person	Signature	Date
Chair of Programme Studies Board		
Approval of Faculty Academic Committee		
Document sent to Quality Support by Programme Leader		
Quality Support send to DVC (Academic)		
Approved by DVC, on behalf of Academic Board		
Quality Support checked ; d) copy of document returned to faculty e) copy of document kept on QAE Programme regulations file f) copy sent to QMSC for note		a) b) c)
Faculty attach PART B only as appendix 2 to Programme Specification		

PART B - PROGRAMME REGULATION/S

Name of programme: *Computer Networks and Cybersecurity*

Title of final award: *MSc Computer Networks and Cybersecurity*

Interim awards¹: *Postgraduate Certificate in Computer Networks and Cybersecurity, Postgraduate Diploma in Computer Networks and Cybersecurity.*

Students who pass 60 credits are eligible for a Postgraduate Certificate in *Computer Networks and Cybersecurity*. Students must have passed either CITM15 or CETM30 as part of these 60 credits. Students who pass all the taught modules on the programme are eligible for a Postgraduate Diploma in *Computer Networks and Cybersecurity*.

Accreditation: *BCS Accreditation for the Masters will be sought (MSc Network Systems which this programme is replacing currently has BCS accreditation – Partially meeting the requirement for Chartered IT Professional). The other awards are not accredited.*

University Regulation (please state the relevant University Regulation): *4.2.1. The overall pass mark for each module is 40%. To pass a module a student must also have submitted work for each element of assessment.*

Regulations apply to students commencing their studies from (please state the date / intake that these regulations will apply to students for each Stage):

Regulations apply to students	Date the regulations apply	Intakes affected
Stage 1		
Stage 2		
Stage 3		
Stage 4	September 2018	September 2018 onwards

Stage 4

Core modules:

	Code	Title	Credits
<i>CERT/DIP PHASE</i>	<i>CITM15</i>	<i>Network Infrastructure</i>	<i>30</i>
	<i>CETM30</i>	<i>Fundamentals of Cybersecurity</i>	<i>30</i>
	<i>CETM48</i>	<i>Secure Network Design</i>	<i>30</i>
	<i>CETM49</i>	<i>Network Service Provision</i>	<i>30</i>
<i>MASTERS PHASE</i>	<i>PROM02</i>	<i>Computing Masters Project</i>	<i>60</i>

Optional Modules

None

Elective Modules

None

¹ Same as main award unless agreed otherwise at validation – eg to meet PSRB requirements
Version 10

Progression Regulations

There are no programme-specific progression regulations²

² This will be the norm – university regulations apply
Version 10



Quality Handbook

SITS SUMMARY PROGRAMME/SHORT COURSE DETAILS

(Form to be completed electronically by the Faculty and forwarded to the Quality Support Officer supporting the Approval event, or sent to Planning & MI for faculty devolved processes before sending to Quality Support (with the exception of Short Courses and GRS))

This form is to be completed when a new programme has been validated and approved so that the programme codes and progression and awards rules can be set up in SITS. This also needs to be completed at periodic course review when there have been significant modifications to the course.

Please note that all details entered onto this form will go onto every student's record that is attached to this programme and it is therefore imperative that the information is correct.

1 Programme Details	
New/ Modification/Review: Please ensure the minor modification document is included	Modification
Full Programme Title:	MSc Computer Networks and Cybersecurity
If replacement for existing course, specify title and course code:	MSc Network Systems
Qualification Aim: e.g. Foundation degree of Science, Bachelor of Arts (Honours)	Masters
Qualification Level (NQF level):	7
JACS 3.0 code JACS code = e.g. (V100) History, (I100) Computing Science, etc. See HESA Website https://www.hesa.ac.uk/jacs3	I120
Is the programme Open or Closed: A course is defined as closed when specifically designed for a certain group of people and not also available to other suitably qualified candidates. It may be designed for a particular company however if the same course is also run for other suitably qualified candidates, not employed by the company, then the course is not closed.	Open
Faculty and School:	Computer Science Computer Science
Location of study: e.g. SAGE, Sunderland in London, Sunderland	Sunderland
Last Date Registration (PBI) Number of days: The number of days after the start date of the course that it is possible for students to register onto it. It is also referred to as the migration date.	15
Programme Leader:	Dr David Nelson
Academic Team for the programme:	Postgraduate computing team
Date of Approval/Modification/Review:	June 2013
Date of next review (QS to complete):	

Accrediting Body or PSRB If yes please attach a completed PSRB form	Yes/No
Programme Specific Regulations If yes, please attach a completed Programme Specific Regulations form	Yes/No/Pending
Does this programme come under the Key Information Set return? If yes, please attach a completed KIS form	No
Is this an undergraduate programme whose primary (but not necessarily only) purpose is to improve the effectiveness of practitioners registered with a professional body? If yes, please specify which body: http://www.hefce.ac.uk/media/HEFCE,2014/Content/Pubs/2016/201622/HEFCE2016_22.pdf (Page 88, paragraph f) e.g. a short course aimed at registered nurses	Yes/No Professional Body:

Interim Awards			
If a student does not achieve their qualification aim, what lower awards might they be entitled to, assuming they have the credits? The subject title for any lower level award should be given where this is different from the subject of the qualification aim.			
	Interim Award Title	Credits Required	Interim Structure Please show mandatory requirements if applicable e.g. core module codes
1	PG Certificate in Computer Networks and Cybersecurity	60	Two from CITM15, CETM30, CETM48, CETM49 (must include one or both of CITM15, CETM30)
2	PG Diploma in Computer Networks and Cybersecurity	120	CITM15, CETM30, CETM48, CETM49
3			

Combined Subjects Programmes only	
Will the subject run as Major/Minor/Dual:	
Any subject(s) not permitted to be combined with this subject:	

2 Mode Of Attendance		
01	Full-time <i>Full-time students are those expected to study for more than 24 weeks per year, for a minimum of 21 hours per week and are paying the full-time fee.</i>	Yes
02	Other Full-time <i>Students who attend full-time for a period less than 24 weeks per year</i>	
31	Part-time <i>Students who are expected to study for less than 21 hours per week.</i>	Yes
31	Part-time at Full-time Rate <i>Students who are studying full-time credits over part-time attendance</i>	

3 Admissions	Tick appropriate

An admissions or MCR code will be created to allow student applications.		
U UCAS Universities and Colleges Admission Services <i>Required for full-time undergraduate programmes only.</i>		
D Direct Entry <i>Required for FT, PT, PG and PGR, only where students will be admitted through the admissions teams or where the programme needs to be advertised on the web</i>		Yes
G GTTR Graduate Teacher Training Registry <i>Education only, where applicable</i>		

4 Collaborative Provision	UK	
	Overseas	
Institution	Collaborative Model	Funding Arrangements
5a Course Block		
Full-time - Overall length of the programme in months:		14 months
Part-time - Overall length of the programme in months:		24 months
Does this course offer a sandwich placement? If yes , please indicate which programme year this placement is to take place.		Yes/No Programme Year:
Is this compulsory or optional?		Compulsory/Optional
Does this course offer a study abroad year out? If yes , please indicate which programme year this placement is to take place.		Yes/No Programme Year:
Is this compulsory or optional?		Compulsory/Optional

6 Major Source of Funding	
Please note this relates to funding for the programme and not individual students	
HEFCE Higher Education Funding Council for England	Yes
Skills Funding Agency/EFA/Degree Apprenticeship	
NCTL National College for Teaching and Leadership	
Wholly NHS Funded Partially NHS Funded Departments of Health/NHS/Social Care. <i>For all Health funded programmes please indicate whether the programme is eligible for an NHS Bursary</i> - Eligible for NHS Bursary Y/N	
Standard Fee If no then the Learning Resources Form should be attached	Yes/No

Other Funding:	
– Please Specify:	

7 Education Programmes Only	
This section must be completed for any programmes marked above as 'NCTL' funded	
Teacher Training Identifier:	
Teacher Training Scope:	
Qualification Aim: QTS and academic award, QTS only, QTS by assessment only	

DETAILS SUPPLIED BY: ...Dr David Nelson.....

DATE: 18/06/2018

Module List

Award, Route (if applicable) and Level	New/Existing/ Modified Module (N/E/MM)	Module Title	Module Code	Module Credit Value	Whether core or option	Must choose (i.e. designated option):	Assessment weighting – give % weight for each assessment item	Pre-/co-requisites	Module leader	Other comment (if required)	Date of Entry on SITS. N/MM only (After event)	JACS Code	Academic Team
Taught (Cert/Dip)	E	Fundamentals of Cybersecurity	CETM30	30	Core		001 Coursework 50% 002 Coursework 50%		Prof. Alastair Irons			I100	Prof. Alastair Irons
	E	Network Infrastructure	CITM15	30	Core		001 Coursework 50% 002 Coursework 50%		Mr. David Evans			I120	Mr. David Evans
	N	Secure Network Design	CETM48	30	Core		001 Coursework 50% 002 Coursework 50%		Mr. Stephen Swales			I120	Mr. Stephen Swales, Mr. David Evans
	N	Network Service Provision	CETM49	30	Core		001 Coursework 40% 002 Coursework 60%		Mr. Philip Irving			I100	Mr. Philip Irving, Mr Michael Lawrence

Masters	E	Computing Master's Project	PROM02	60	Core		001 Coursework 10%		Dr. David Nelson			I100	Dr David Nelson, Dr Sharon McDonald
							002 Coursework 60%						
							003 Viva + Coursework 30%						

APPENDIX 4 - Benchmark mapping – MSc Computer Networks and Cybersecurity

The [QAA benchmark](#) specifies the threshold standard of achievement, i.e. the standard expected to be achieved by a student graduating with the award of a master's degree in computing. The threshold level specifies:

7.2 All students graduating with a master's degree in computing are expected to be able to have demonstrated:

1. a systematic understanding of the knowledge of the domain of their programme of study, with depth being achieved in particular areas, including both foundations and issues at the forefront of the discipline and/or professional practice in the discipline; this should include an understanding of the role of these in contributing to the effective design, implementation and usability of relevant computer-based systems
2. a comprehensive understanding, and a critical awareness of: the essential principles and practices of the domain of the programme of study as well as current research and/or advanced scholarship; current standards, processes, principles of quality and the most appropriate software technologies to support the specialism; the relevance of these to the discipline and/or professional practice in the discipline; and an ability to apply these
3. consistently produced work which applies to and is informed by research and/or practice at the forefront of the developments in the domain of the programme of study; this should demonstrate critical evaluation of aspects of the domain, including appropriate software support, the ability to recognise opportunities for software or hardware tool use as well as possible tool improvement, an understanding of the importance of usability and effectiveness in computer systems development, and generally the acquisition of well-developed concepts
4. understanding of the professional, legal, social and ethical framework within which they would have to operate as professionals in their area of study; this includes being familiar with and being able to explain significant applications associated with their programme of study and being able to undertake continuing professional development as a self-directed lifelong learner across the elements of the discipline
5. the ability to apply the principles and practices of the particular programme's domain in tackling a significant domain related activity; the solution should demonstrate a sound justification for the approach adopted as well as originality (including exploration and investigation) and a self-critical evaluation of effectiveness but also critical awareness of current problems and new insights, and a sense of vision about the direction of developments in aspects of the domain of the programme.

The tables below provide a mapping of the benchmark against the programme learning outcomes:

	S1	S2	S3	S4	S5	S6	S7	S8	S9
1	Y		Y	Y	Y		Y		Y
2			Y	Y	Y		Y	Y	
3	Y	Y		Y			Y	Y	
4		Y				Y			
5						Y	Y	Y	Y

	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10
1	Y	Y	Y	Y	Y	Y				Y

2			Y	Y	Y	Y		Y	Y	Y
3	Y	Y	Y					Y	Y	Y
4							Y	Y		
5			Y					Y	Y	Y