PART TWO PROGRAMME SPECIFICATON

BSc (Hons) Computer Networks and Security
BSc (Hons) Computer Networks and Security (with Industrial Placement)

1 **Awarding body**

Glyndŵr University

2 **Programme delivered by**

Glyndŵr University

3 **Location of delivery**

Plas Coch Campus, Wrexham

4 **Faculty / Department**

Faculty of Arts, Science and Technology

5 **Exit awards available**

BSc (Ord.) Computer Networks and Security
DipHE Computer Networks and Security
CertHE Computer Networks and Security

6 **Professional, Statutory or Regulatory Body (PSRB) accreditation**

The programme has been designed to align with the requirements of the British Computer Society (BCS) and accreditation will be requested post approval.
The information above is correct at the point of programme validation, refer to university PSRB register and university website for current details of programme accreditation.

7 **Accreditation available**

See above.

8 **Please add details of any conditions that may affect accreditation (e.g. is it dependent on choices made by a student?)**

Students must have studied all years at the WGU campus.

9 **JACS3 code**

I120

10 **UCAS code**

BSc (Hons) Computer Networks and Security I567

	BSc (Hons) Computer Networks and Security (with Industrial Placement) CNIP
11	**Relevant QAA subject benchmark statement/s**
	Computing (2016)
12	**Other external and internal reference points used to inform the programme outcomes**
	BCS: Core requirements for accreditation of honours programmes BCS: Additional requirements for CITP BCS: Additional requirements for CEng/CSci
13	**Mode of study**
	Full time
14	**Normal length of study**
	BSc (Hons) Computer Networks and Security (with Industrial Placement): 4 years full-time BSc (Hons) Computer Networks and Security: 3 years full-time
15	**Maximum length of study**
	Refer to academic regulations.
16	**Language of study**
	English

17 Criteria for admission to the programme

Standard entry criteria

Entry requirements are in accordance with the University's admissions policy https://www.glyndwr.ac.uk/en/media/FINAL%20ADMISSIONS%20POLICY%202020 17.pdf

The University's entry requirements are set out at http://www.glyndwr.ac.uk/en/Undergraduatecourses/UCAStariffchange2017/

International entry qualifications are outlined on the National Academic Recognition and Information Centre (NARIC) as equivalent to the relevant UK entry qualification.

In addition to the academic entry requirements, all applicants whose first language is not English or Welsh must demonstrate English language proficiency.

European students are able to provide this evidence in a number of ways (please see http://www.glyndwr.ac.uk/en/Europeanstudents/entryrequirements/ for details), including IELTS.

International students require a UKVI Approved Secure English Language Test (SELT) (please see http://www.glyndwr.ac.uk/en/Internationalstudents/EntryandEnglishLanguageRequ irements/ for details).

International Students are not eligible to study the Industrial Placement programme.

DBS Requirements

Students following the BSc (Hons) Computer Networks and Security (with Industrial Placement) programme may be required to obtain a successful DBS check, depending upon the nature of the Industrial Placement secured. This will be dealt with as part of the negotiation, regarding the placement, between the student, University and placement provider.

No DBS check is required for the BSc (Hons) Computer Networks and Security programme.

Non-standard entry criteria and programme specific requirements

Applicants for this programme are required to hold a minimum of grade C in A-Level Mathematics or equivalent.

Applicants with significant industry or professional experience will be treated on a case-by-case basis and invited for a discussion/interview with a member of the programme team.

18 Recognition of Prior (Experiential) Learning

Applicants may enter the programme at various levels with Recognition of Prior Learning (RPL) or Recognition of Prior Experiential learning (RPEL) in accordance with the University General Regulations. Any programme specific restrictions are outlined below

Programme specific restrictions

N/A

19 Aims of the programme

The broad field of computing is an exciting, challenging and dynamic discipline. Computers form an integral part of every aspect of society and modern life. New computing technologies are introduced at an enormous rate and the computing field develops and changes continually and rapidly.

Students studying this programmes will be exposed to an education and learning experience that aims to instil knowledge and develops critical and intellectual abilities applicable to problem solving and solution specifying in technologically and socially diverse environments.

The purpose of this programme is to prepare graduates for a career in the computing field. Their educational journey begins by providing them with a solid set subject-specific knowledge and skills, which gradually draws to a narrower focus of Computer Networks and Security subjects over the duration of their studies. Integrated into this experience is the explicit opportunity to gain first-hand involvement with the workplace, by completing the Industrial Placement at level 5. Although these are two distinct, named award routes, the programme team foresee that students may choose to start on one, but switch to the other, prior to completion of their core modules at level 5; thereby affording them the optionality of this year in industry.

The overall aims of the programmes are to:

BSc (Hons) Computer Networks and Security (with Industrial Placement)

- Provide students with knowledge and understanding of the fundamental principles and technologies which underpin the discipline of Computer Networks and Security;
- Produce independently learning, workplace ready practitioners with a strong set of communication and employment skills who are cognisant of their career trajectory and personal and professional development goals;
- Provide a rigorous and scientifically-based course of study, informed by research, which successfully balances practical vocational skills with theoretical understanding;
- Produce versatile and resourceful practitioners fostering innovation, enterprise and enthusiasm for excellence in the discipline of Computer Networks and Security;
- Develop capability in the exploration, critical analysis and evaluation of technical, business and professional issues and concepts, including an awareness of ethical and environmental factors;
- Provide students with an awareness of the roles and responsibilities of a professional working within the Computer Networks and Security profession.
- Enable students to spend a significant period of time in the Computer Networks and Security related workplace and to reflect upon their experiences and lessons learned therein.

BSc (Hons) Computer Networks and Security

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- Provide a rigorous and scientifically-based course of study, informed by research, which successfully balances practical vocational skills with theoretical understanding;
- Produce versatile and resourceful practitioners fostering innovation, enterprise and enthusiasm for excellence in the discipline of Computer Networks and Security;
- Develop capability in the exploration, critical analysis and evaluation of technical, business and professional issues and concepts, including an awareness of ethical and environmental factors;
- Provide students with an awareness of the roles and responsibilities of a professional working within the Computer Networks and Security profession.

20 Distinctive features of the programme

The demand for graduates with the knowledge, understanding and skills required to analyse, design, develop, test and maintain modern computer systems is high. Organisations rely on the use of computers for information processing and problem solving so the industry requires specialists to create, understand and further advance Computer Networks and Security. This degree will look at the Computer Networks and Security at the core of the underlying technologies that are increasingly infiltrating every element of our society.

Employability skills are at the heart of our computer courses including team working, project management, communication and creative thinking. This degree aims to equip you with the knowledge and skills required to work as professional engineer and/or consultant in the design, configuration and management of computer systems. The main focus is on the more technical aspects and underlying principles of computer systems.

The programme begins at level 4 by providing a solid foundation and introduction to the broad disciplines and that underpin the subject of Computer Networks and Security, resulting in a strong understanding of the subject. This includes developing core knowledge in subjects such as computer systems and professionalism, alongside practical subject skills, such as computer programming. Upon commencement of level 5, a number of these themes are developed further, and to a more advanced level, with a particular emphasis upon enabling students to effectively apply what they have learned to real-world scenarios. During level 6 of the programme, an even sharper focus is provided in terms of the subject-specific material being taught. This happens in tandem with students being provided with the freedom to pursue a project of choice, under supervision. The defining features of level 6 are the encouragement for students to demonstrate their abilities as independent learners and to exercise critical and analytical thinking and problem solving skills.

The opportunity of an Industrial Placement Year is a defining feature of this programme. It takes place upon completion of level 5 (full-time study only) after which students return to complete level 6 of the course. The Industrial Placement Year provides students with an opportunity to gain valuable experience of the workplace, put the knowledge and skills developed so far into practice, and to acquire new information and abilities in a practical setting.

Students studying these programmes will be exposed to an education and learning experience that aims to instil knowledge and develops critical and intellectual abilities applicable to problem solving and solution specifying in technologically and socially diverse environments. Students will have opportunities to apply their knowledge on real life projects. This will help ensure that students acquire the necessary knowledge and skills to cope with the astonishing rate of change and to ensure that the programme produces graduates who operate on graduation as autonomous computing professionals.

21 Programme structure narrative

The programmes are delivered following the University Academic Calendar, typically consisting of an academic year composed of two semesters, each 12 weeks in length. The majority of modules have duration of one semester, although there are some exceptions to this rule, as shown in the subsequent section.

The BSc (Hons) Computer Networks and Security (with Industrial Placement) programme is provided on a full-time only basis. Full-time students would normally complete their studies in four years. The third year must be based substantially in the workplace and would normally be expected to have at least the same duration as two complete semesters at the University (24 weeks) and take place between October and May of the calendar year.

The BSc (Hons) Computer Networks and Security programme is provided on a full-time basis. Full-time students would normally complete their studies in three years.

Full-time students are expected to complete 120 credits per academic year.

Students will normally begin their studies at level 4 of the programme and progress through to completion of level 6. However, students with appropriate advance standing and/or the University Recognition of Prior (Experiential) Learning (RP[E]L) may be able to join the programme at the commencement of level 5 or level 6. In addition, to facilitate student exchange programmes, such as the ERASMUS scheme, it is possible for students to begin their studies at the beginning of the first or second semester, with agreement of the Programme Leader.

The following intended and exit awards are available from this programme, subject to the specified requirements:

Award	Credit Requirements
BSc (Hons) Computer Networks and Security (with Industrial Placement)	480 credits (including 120 credits at level 5 from the Industrial Placement module)
BSc (Hons) Computer Networks and Security	360
BSc (Ord) Computer Networks and Security	300
DipHE Computer Networks and Security	240
CertHE Computer Networks and Security	120

22 Programme structure diagram

FULL-TIME STUDY (INDICATIVE)

Level 4								
Semester 1	Mod title	Computer Systems	Mod title	Managing Data	Mod title	Problem Solving with Programming	Mod title	Information and Systems Engineering*
	Mod code/ 'New' Module	COM434	Mod code/ 'New' Module	COM438				
	Credit value	20	Credit value	20	Mod code/ 'New' Module	COM439	Mod code/ 'New' Module	COM437
	Core/Option	Core	Core/Option	Core				
	Mod leader	Jess Muirhead	Mod leader	Bindu Jose				
Semester 2	Mod title	Web Design & Development	Mod title	Fundamentals of Networks and Security	Credit value	20	Credit value	20
	Mod code/ 'New' Module	COM440	Mod code/ 'New' Module	COM436				
	Credit value	20	Credit value	20	Core/Option	Core	Core/Option	Core
	Core/Option	Core	Core/Option	Core				
	Mod leader	Julie Mayers	Mod leader	Paul Comerford	Mod leader	Rich Picking	Module leader	Denise Oram

* Problem Solving with Programming and Information and Systems Engineering modules take place over Semester 1 and Semester 2.

	Level 5					
Semester 1	Mod title	Responsible Computing	Mod title	Applied Programming	Mod title	Group Project
	Mod code/ 'New' Module	COM545	Mod code/ 'New' Module	COM537	Mod code/ 'New' Module	COM553
	Credit value	20	Credit value	20	Credit value	20
	Core/Option	Core	Core/Option	Core	Core/Option	Core
	Mod leader	Denise Oram	Mod leader	John Worden	Mod leader	Bindu Jose, Denise Oram
Semester 2	Mod title	Server Technologies	Mod title	Networking: Scaling Networks	Mod title	Network Protocols and Algorithms
	Mod code/ 'New' Module	COM546	Mod code/ 'New' Module	COM551	Mod code/ 'New' Module	COM555
	Credit value	20	Credit value	20	Credit value	20
	Core/Option	Core	Core/Option	Core	Core/Option	Core
	Mod leader	Paul Comerford	Mod leader	Paul Comerford	Mod leader	Vic Grout

	Level 5 (with Industrial Placement award only)	
Semester 1	Mod title	Industrial Placement
	Mod code/ 'New' Module	New
	Credit value	120
Semester 2	Core/Option	Core
	Mod leader	TBC

	Level 6					
Semester 1	Mod title	Network Security	Mod title	Managing Networks and Systems	Mod title	IT Project Management
	Mod code/ 'New' Module	COM645	Mod code/ 'New' Module	COM651	Mod code/ 'New' Module	COM644
	Credit value	20	Credit value	20	Credit value	20
	Core/Option	Core	Core/Option	Core	Core/Option	Core
	Mod leader	Paul Comerford	Mod leader	Nigel Houlden	Mod leader	Denise Oram
Semester 2	Mod title	Future Technologies	Mod title	Project		
	Mod code/ 'New' Module	COM643	Mod code/ 'New' Module	COM646		
	Credit value	20	Credit value	40		
	Core/Option	Core	Core/Option	Core		
	Mod leader	Vic Grout	Mod leader	Vic Grout		

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23 Intended learning outcomes of the programme

Guidance – The intended learning outcomes of the programme should be listed under the headings of:
- *Knowledge and understanding*
- *Intellectual skills*
- *Subject skills*
- *Practical, professional and employability skills*

Please note that the programme learning outcomes must be differentiated by award, including all final and exit awards proposed.

Please format the learning outcomes grammatically so they complete the sentence "On completion of level 4/5/6, students will be able to ...".
Rows can be added as required.

Undergraduate				
Knowledge and understanding				
	Level 4	Level 5	Level 6	Level 6 Honours Degree	
A1	*Demonstrates a working understanding of essential facts, concepts, principles and theories relating to computing and computer applications. Shows competence in basic IT and communication skills, workshop practice and laboratory investigations*	*Demonstrates a widening appreciation of the significance of key concepts, principles, theories and practices that underpin computing as an academic discipline and explores its extent and boundaries through practical work, design exercises and case studies*	*Shows confident familiarity with the broad areas of the knowledge bases of the discipline, including the management and an appreciation of the principles, theories and practices that underpin computing as an academic discipline. Reveals a working understanding of current technology and of its limits*	*Demonstrates confidence and reveals a clear understanding of the boundaries of existing and emerging technology and the limits of its application, and of the range of conventional design methods and the types of judgement employed by computing professionals*	
A2	*The appropriateness of a range of development tools for the creation of software applications*	*Recognise and understand a range of appropriate programming tools and techniques in new contexts in the design of software applications*	*Select and deploy accurately established techniques and tools to develop applications for selected business problems, and choose appropriate theory for analysis, with only general guidance*	*Confidence and flexibility in applying a range of programming tools for the creation of applications for selected business problems, and in the application of knowledge and skills appropriate to their solution*	
A3	*Demonstrate a working knowledge of some of the*	*Familiarity and ability to choose appropriate methods and tools for*	*Select accurately established techniques and methods used in*	*Critical and reflective about the use of software testing, design and*	

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Undergraduate

Knowledge and understanding

	Level 4	Level 5	Level 6	Level 6 Honours Degree	
	tools, practices and methodologies used in the specification, design, implementation and testing of computer software systems; understand some of the risks of software implementation	*the design and implementation of software systems. Outline how software can be evaluated and show a working knowledge of the general rules and best practices adopted and knowledge of software testing techniques*	*defining and assessing criteria for measuring the extent to which a computer system is appropriate for its current deployment; understand the risks of software implementation and apply risk-based strategies and policies for software testing*	*evaluation methodologies and tools, with full understanding of the associated risks, controls and potential impact*	
A4	*Recognise a variety of professional and sustainability considerations that may be encountered in the exploitation of computer-based systems (social, legal, ethical, moral, economic, etc.)*	*Identify and describe several professional concepts and challenges that will be encountered in the deployment of computer-based systems in response to common, well-defined scenarios*	*Comprehensively appraise professional situations and scenarios where computer-based systems are deployed in terms of social, legal, ethical, moral, economic and sustainability issues.*	*Reflect upon own practices and conduct in carrying out a substantive project and discuss the social, legal, ethical, moral, economic and sustainability issues that are relevant to the project.*	
A5	*Identify key operations, processes and functions that support the construction of computer networks and their infrastructure*	*Discuss and identify algorithmic solutions for common network and communications problems and highlight their performance and functional differences*	*Analyse complex computational problems, contrast network configurations and protocols, and evaluate their performance*	*Consistently show confidence and independence in understanding and modelling efficient networks and protocols to address real world problems*	

Intellectual skills

	Level 4	Level 5	Level 6	Level 6 Honours Degree	
B1	*Using the tutor as a facilitator, the student begins to analyse basic problems, identify requirements and propose alternative solutions for computer software systems*	*Starts to develop an understanding of the limits of their knowledge, and how this influences analysis and interpretations based on that knowledge; identify requirements and propose and compare alternative solutions for computer software systems*	*Develops self-reliance and confidence in the analysis of problems, identify requirements and propose and critically evaluate alternative solutions for computer software systems*	*Integrates learned theory and techniques with practical experience to analyse problems, identify requirements and propose and critically evaluate alternative solutions for computer software systems with informed understanding*	

	Intellectual skills			
	Level 4	Level 5	Level 6	Level 6 Honours Degree	
B2	*Demonstrates basic numeracy, literacy and algebraic competence; ability to manipulate data related to simple business problems and describe scenarios*	*Demonstrates more advanced standard numerical/ mathematical skills and literacy as appropriate to their chosen specialist subject*	*Applies a range of more specialist numerical/ mathematical and literacy skills as appropriate to their specialist subject*	*Confidently applies a range of specialist numerical/ mathematical and literacy skills as appropriate to the specialist subject area*	
B3	*Carries out application of basic computing principles and procedures to standard, simple situations, with considerable guidance provided by tutors*	*Applies standard computing principles and procedures to somewhat more demanding situations, still with some guidance provided*	*Demonstrates ability to select and use principles and procedures appropriate to the situation or problem in hand, with minimal guidance provided*	*Carries out confident and accurate selection and application of principles and procedures to the solution of a range of computing situations and problems, working autonomously*	
B4	*Develops an ability to explore and recognise any risks or safety aspects that may be involved in their work and to the relevance of selected professional, legal, moral, social and ethical issues; communicate the results of their study/work accurately and reliably, and with structured and coherent arguments*	*Uses a range of established techniques within tutorials, for example, using experiential learning exercises, to explore and recognise the relevance of selected professional, legal, moral, social and ethical issues in their work and to communicate the results of their study/work accurately and reliably, and with structured and coherent arguments*	*Demonstrates technology industry acumen, with minimum supervision, recognising the relevance of legal, professional, moral, social and ethical issues in the work place and the wider environment. Able to inform and adapt their work to satisfy these issues*	*Effective self-management in terms of time; ability to conduct research independently or as a team, into legal, professional, moral, social and ethical issues. Able to inform and adapt their work to satisfy these issues. Demonstrates an ability to carry out research and critical thinking*	

	Subject skills			
	Level 4	Level 5	Level 6	Level 6 Honours Degree	
C1	*Systematically relates a limited number of facts/ideas/elements in an imitative manner, with considerable guidance provided by tutors*	*Demonstrates appreciation of need for the relating and collecting of a range of facts/ideas/elements in an argued case; produces new ideas in closely-defined situations with*	*The ability to apply research methods to relate and collect facts/ ideas/ elements in an argued case; produces new ideas in a wider range of situations, with minimal guidance*	*The ability to apply appropriate research methods to collate facts/ ideas/ elements in support of a well-structured argument; design solutions to problems and evolve*	

	Subject skills				
	Level 4	Level 5	Level 6	Level 6 Honours Degree	
		some guidance provided as appropriate		*new concepts, working autonomously*	
C2	*Identify and understand the need to manage software and IT development projects*	*Apply appropriate project management and development tools to ensure viable and organised approaches are taken*	*Compare and contrast a range of IT project management methods and employ high-level tools and methods in real-world scenarios*	*Select and evaluate own use of IT project management methods and tools in a self-led and managed project*	
C3	*Implement computer programs for specific and well defined situations*	*Design and write computer programs or software for common applications*	*Specify and write computer programs or software in response to loosely defined problem scenarios*	*Specify and write computer programs or software in response to loosely defined problem scenarios and evaluate the quality of the solution*	
C4	Recognise and understand small-scale and simple large scale network configurations	*Apply and utilise a range of networking tools and technologies in constrained and well-defined problem scenarios*	*Confidently engage with a range of networking tools, protocols and technologies and select and apply appropriate to complex problems*	*Independently engage with and select network technologies and techniques and/or consider their appropriateness in emerging technology scenarios*	

	Practical, professional and employability skills				
	Level 4	Level 5	Level 6	Level 6 Honours Degree	
D1	*Be able to provide an account of own actions and activities in a succinct and clear manner in written and oral communication*	*Communicates in a clear, systematic and concise way, in writing and orally, in more formal academic and professional styles, and in longer pieces of work of a technical nature. Be able to draw upon and effectively integrate supporting media*	*Engages effectively in a variety of roles; debates; produces clear, well-structured technical reports and other extended pieces of work; gives clear, subject-specific presentations in a variety of contexts*	*Provide professional levels of information through a variety of verbal and non-verbal communication mediums and reflect upon own interaction and ability to support own opinions and arguments for a variety of audiences*	
D2	*Interacts effectively with tutors and fellow students; participates in clearly defined group situations*	*Demonstrates more advanced interactive and group skills, including effective participation in more demanding group tasks, presentations, or discussions*	*Interacts effectively within a learning or subject-specific group, demonstrates basic negotiating, role, leadership and group-support skills*	*Interacts effectively within learning or professional groups; demonstrates appropriate negotiating, role, leadership and group-support skills to an advanced level*	

D3	*Select under guidance and use relevant sources of information to identify potential computing resources for a specific purpose. Demonstrates basic skill in using the Internet and designing web pages.*	*Demonstrates more advanced IT skills; Demonstrates competent use and application of business databases, additional specialist subject packages and produce reports to business standard. Use of online databases effectively to gain information.*	*Demonstrates, uses and accesses a limited selection of more specialist IT skills related to subject specific software. Conducts effective searches for information to identify potential computing resources for a specific purpose and critically evaluate their merit*	*Uses and accesses a limited selection of more specialist IT skills related to subject specific software for analysing business data. Conducts effective searches for information to identify potential computing resources for a specific purpose and critically evaluate their merit*	
D4	*Studies in a systematic, directed way with the aid of appropriate Tutor guidance*	*Learns in an increasingly effective and purposeful way, with beginnings of development as an autonomous learner*	*Adopts a broad-ranging and flexible approach to study; identifies learning needs; pursues activities designed to meet these needs in increasingly autonomous ways*	*With minimal guidance, manages own learning using a wide range of resources appropriate to the IT profession; seeks and makes effective use of feedback. Self-reflection and criticality including self -awareness, openness and sensitivity to diversity in terms of people, cultures, business, management and marketing issues*	
D5	*Shows an understanding of the opinions of other people; flexibility in considering alternatives and opinions*	*Demonstrates the ability to take the perspective of others; identifying the similarities and differences between two approaches to the solution of a given problem*	*Demonstrates the ability to take the perspective of others; comparing the strengths and weaknesses of alternative interpretations determining the credibility of a source of information*	*Demonstrates the ability to take the perspective of others; articulate the strengths and weaknesses of the suggestions of arguments posed; recognize the underlying agendas and motivations of individuals and groups involved in a given situation*	

24 Curriculum matrix

To demonstrate how the overall programme outcomes are achieved and where skills are developed and assessed within individual modules.

	Module Title	Core or option?	A1	A2	A3	A4	A5	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4	D5
Level 4	Computer Systems	Core	■	□	□	□	□	□	■	■	□	■	□	□	□	■	□	□	□	□
	Managing Data	Core	■	□	■	□	□	■	■	■	□	□	□	■	□	■	□	■	□	□
	Information and Systems Engineering	Core	■	□	■	■	□	■	□	□	■	□	■	□	■	■	□	□	■	■
	Fundamentals of Networks and Security	Core	■	□	■	□	■	□	■	■	□	□	□	□	■	■	□	■	□	□
	Web Design & Development	Core	■	■	■	□	■	■	□	■	□	□	□	■	□	■	□	■	□	□
	Problem Solving with Programming	Core	■	■	□	□	■	■	□	■	□	□	□	□	■	□	□	□	□	□
Level 5	Applied Programming	Core	■	■	■	□	■	□	■	■	□	□	□	■	□	□	□	■	□	□
	Group Project	Core	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Network Protocols and Algorithms	Core	■	■	□	■	■	□	■	■	□	□	□	■	□	□	□	■	□	□
	Networking: Scaling Networks	Core	■	□	■	□	■	□	■	■	□	□	□	□	■	■	□	■	□	□
	Server Technologies	Core	■	□	■	□	■	■	■	■	□	□	□	■	■	■	□	■	□	□
	Responsible Computing	Core	■	■	■	■	□	■	□	■	■	■	■	□	□	■	■	■	■	■
	Industrial Placement	Core	□	■	□	■	■	■	□	■	■	□	■	■	■	■	■	■	■	■
Level 6	Network Security	Core	□	□	■	□	■	■	■	■	□	□	□	□	■	□	□	□	□	□
	Managing Networks and Systems	Core	■	□	■	■	■	□	■	■	■	■	□	□	□	■	□	■	■	□
	Future Technologies	Core	■	□	□	□	□	□	□	□	■	■	□	□	□	■	■	■	■	■
	IT Project Management	Core	□	□	■	■	□	■	□	■	■	□	■	□	□	■	■	□	□	■

Module Title	Core or option?	A1	A2	A3	A4	A5	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4	D5
Project	Core	☐	■	■	■	■	■	■	■	■	■	■	■	■	■	☐	■	■	■

25 Learning and teaching strategy

The programme is informed and guided by the Computing Learning, Teaching and Assessment strategy. It seeks to assist the student to become an independent learner, delivering subject skills alongside the embedding of skills for employment. The curriculum is designed to encourage an appreciation for learning. Learning is enriched by appropriate underpinnings, current research, industrial applications and the development of transferable skills.

The majority of scheduled learning and teaching activities is through attendance at lectures, guest talks, tutorials, and labs. Attendance at external events and field trips are made available and as when they are appropriate and practicable. These modes of contact provide students with the ability to develop and practice the range of learning outcomes associated with the programme, ranging from the theoretical to the practical.

In the early stages of each module, problems will be well defined and limited in scope and scale. At later stages, problems will become less structured (to encourage reflection on problem issues) and open-ended (to give scope to propose and evaluate alternative solution strategies). Case studies are used when appropriate to integrate study topics and to underline vocational relevance. Coursework assignments are important throughout.

As the programme progresses, students are expected to demonstrate increasing proficiency in use of IT tools and techniques to support production of technical documentation, to enhance oral and written presentations, and to aid organisation of personal study material.

Extensive use is made of the University's Virtual Learning Environment (VLE), Moodle, to provide students with access to a range of delivery, and supporting, materials related to each of the modules featured on the programme. In addition to the materials used during the taught sessions, the VLE is used to provide students with additional content such as quizzes, videos, audio recordings, external links, technical reports, research papers, and so forth. The VLE also provides students with the ability to communicate using discussion forums and is the platform primarily used in the issuing, submission, marking, and feedback of student assessment.

26 Work based/placement learning statement

Students will gain work-related experience at several points through their academic studies. For example, in the level 6 Project module there is the opportunity to work in collaboration with organisations external to the University on 'live' ventures. The level 5 Responsible Computing and level 6 IT Project Management modules emphasize the importance or professional and workplace skills, through the use of case studies and real-world problem scenarios.

The Industrial Placement will normally take place during the normal academic year, as if over the two normal University semesters. As such its duration should normally be in the region of 24 weeks, no less than 20 weeks, and no more than 40 weeks. As such, students are encouraged to secure placements prior to the commencement of the academic year in which it is to take place and ideally before the end of the second semester of their level 5 studies. The student and placement provider will negotiate specific working hours, arrangements, and payment. It is the expectation of the University that, whilst the student is being hosted by the Placement Provider,

they will hold a contractual position in that organisation. As such, the Placement Provider is responsible for the Health and Safety of the student and the student will be excepted to have conducted a full risk assessment, in collaboration with the Provider, in advance of placement commencement. The Risk Assessment is a mandatory part of the Placement Proposal, which students require the University to approve.
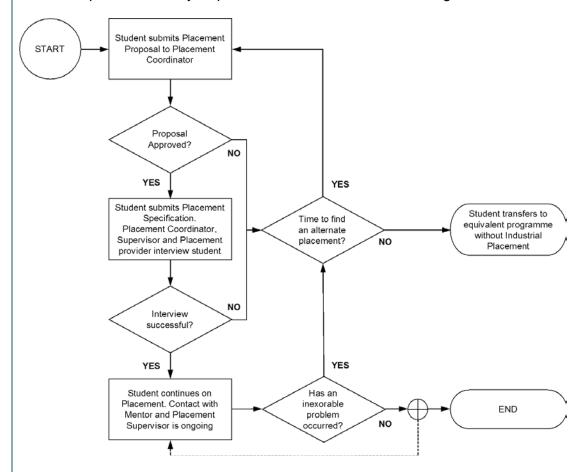
Students intending to take up a placement will be provided with a series of tutorial sessions, led by academic members of staff at the University, in the academic year the precedes the placement. This will be used to ensure that students understand the expectations and requirements of the placement, provide them with guidance and instruction upon obtaining a placement, and in completing the Placement Proposal and Placement Specification forms. It is the responsibility of students to identify and negotiate their own placement opportunity and to keep the University informed of their intentions. Placement Providers will be expected to nominate a Placement Mentor, who will bear responsibility for the student whilst with the Provider and will maintain contact with the Placement Supervisor whilst the student is on placement. Placement Supervisors and Mentors will be provided with a Handbook and the contact details of the Placement Supervisor, the Placement Coordinator, and the Head of Faculty, in case of any issues.

Briefly, the operation of the Industrial Placement will follow these steps:

1. The student will be expected to find and secure a suitable placement opportunity. This could be done independently or in collaboration with a member of staff at the University or via the University Careers Centre.
2. The student will inform the Industrial Placement module leader of the placement opportunity via a Placement Proposal form. The Placement Coordinator will then discuss the opportunity with the student and placement provider and make a decision regarding its suitability. The student will then be asked to complete a Placement Specification, in collaboration with their nominated Provider.
3. The Placement Specification will then be scrutinised. This will involve the Placement Coordinator conducting an interview, alongside the nominated Placement Supervisor and Mentor, of the student to determine the student's suitability to undertake the placement. The Placement Coordinator, Placement Supervisor, and Placement Mentor will determine if the proposed placement meets the academic requirements of the module.
    a. If the placement is approved, practical arrangements will be completed by the student in collaboration with an allocated academic Supervisor and Mentor at the placement provider.
    b. If the placement is not approved the student must find an alternate placement or change to the BSc (Hons) Computer Networks and Security programme.
4. A full set of information, expectations and guidelines will be provided as part of the Industrial Placement Handbook, which will be supplied to students, placement providers and University supervisors and asked to sign a statement of agreement. This will include the Placement Specification, which is, in essence, a learning agreement and details the learning objectives, plan of work, and intended deliverables for the placement provider.
5. The student will produce a progress report before the end of the second semester and this will include a site visit by their academic supervisor.
6. During the course of the placement, the student will complete a learning log, which will be a diarised record of their activities and experience during the

placement. This will also include comments and feedback from their mentor at the placement provider organisation. Students are expected to produce one entry every 3 to 4 weeks during placement.

The entire placement lifecycle process is illustrated in the following flowchart:

Students successfully completing the Industrial Placement module will be awarded the 120 credit value for the module, which is a requirement of obtaining their differentiated award title to include "with Industrial Placement".

If irreconcilable problems occur during the placement the student should attempt to find an alternate placement opportunity. In the event that this cannot be done or if students fail to meet the expectations of the placement year, the student will be transferred to the BSc (Hons) Computer Networks and Security programme and may have to suspend their studies for the remainder of the current academic year. Students failing the placement module will be automatically transferred to the BSc (Hons) Computer Networks and Security programme by the appropriate Progression Board.
Students who withdraw from the industrial placement more than one month after commencement, but prior to completion will revert to the 3 year programme and re-join their studies the following academic year. There will be no opportunity to retake the placement year.

27   Welsh medium provision

The programmes will be delivered through the medium of English. Students are entitled to submit assessments in the medium of Welsh.

28 Assessment strategy

A range and diversity of assessment is provided on the programme as a way to allow students with multiple types of opportunity to demonstrate the skills and knowledge that they are developing over the duration of the programme and to help support inclusivity. This mixture often makes use of assessment methods where students must document a process or solution to a challenge, but also in the submission of artefacts, such as computer programs, databases, media assets, and practical network implementations.

Module code & title	Assessment type and weighting	Assessment loading	Indicative submission date
Computer Systems	Presentation (20%) Class Test (80%)	10 mins present 1.5 hours	Wk 7, Sem 1 Wk 12, Sem 1
Managing Data	Coursework (70%) In-class test (30%)	N/A 1.5 hours	Wk 8, Sem 1 Wk 12, Sem 1
Information and Systems Engineering	Portfolio (100%)	3000	Wk 12, Sem 1
Fundamentals of Networks and Security	Coursework (50%) In-class test (50%)	2000 2 hours	Wk 10, Sem 2 Wk 13, Sem 2
Web Design & Development	Presentation (40%) Coursework (60%)	15 mins N/A	Wk 4, Sem 2 Wk 8, Sem 2 Wk 12, Sem 2 Wk 13, Sem 2
Problem Solving with Programming	50% Coursework 50% Coursework	N/A N/A	Wk 12, Sem 1 Wk 12, Sem 2
Applied Programming	Coursework (100%)	4000 2 hours	Ongoing, Sem 2 Wk 13, Sem 2
Group Project	Group Project (100%)	4000	Wk 12, Sem 1
Network Protocols and Algorithms	Portfolio (75%) Practical (25%)	3000 6 hours	Wk 12, Sem 2
Networking: Scaling Networks	Case Study (40%) Practical (40%) In-class Test (20%)	3000 2 hours 1.25 hours	Wk 6, Sem 2 Wk 10, Sem 2 Wk 12, Sem 2
Server Technologies	Case Study (100%)	4000	Wk 11, Sem 2
Responsible Computing	Coursework (100%)		Wk 12, Sem 1
Industrial Placement	Placement Specification Progress Report Learning Log		Wk 3, Sem1 Wk 12, Sem 1 Wk 12, Sem 2
Managing Networks and Systems	Report (50%) Practical (50%)	3000 2 hours	Wk 6, Sem 1 Wk 12, Sem 1
Network Security	Coursework (40%) Practical (30%) In-class test (30%)	2500 2 hours 1.5 hours	Wk 6, Sem 1 Wk 10, Sem 1 Wk 12, Sem 1
Future Technologies	Presentation (40%) Report (60%)	40% 60%	Wk 6, Sem 2 Wk 12, Sem2
IT Project Management	Coursework (100%)	4000	Wk 12, Sem 1
Project	Project (100%)	12000	Wk 13, Sem 2

29 Assessment regulations

The University regulations for Bachelor Degrees apply.

Derogations

TBC

Non-credit bearing assessment

N/A.

Borderline classifications (for undergraduate programmes only)

The 40 credit Project module at level 6 will be used to determine if a student's classification is to be uplifted to the higher grade.

Restrictions for trailing modules (for taught masters programmes only)

N/A

30 Programme Management

Programme leader

Mrs. Julie Mayers

Module Leaders

Dr. Paul Comerford
Prof. Vic Grout
Mr. Richard Hebblewhite
Mrs. Bindu Jose
Mr. Jason Matthews
Mrs. Julie Mayers
Mrs Denise Oram
Prof. Richard Picking
Mr. Nathan Roberts
Mr. John Worden

Link to Staff Profiles

31 Quality Management

Programme Management
The programme will be managed under the auspices of the Faculty of Arts, Science and Technology and the programme will develop and operate within the terms of the overall management of curriculum within the Faculty. However, there will be a designated Programme Leader who will be responsible for the day-to-day running of the programme, including the following:

- The management and development of curriculum and the course portfolio
- Student tracking and student records
- Collation of assessment data and presentation of data at assessment boards
- Management/co-ordination of overall assessment activities across the programme
- Liaison with external bodies and agencies
- Quality assurance and annual monitoring, including compilation of the Annual
- Monitoring Report

- Co-ordination of admissions activities and other recruitment activities, including relevant publicity activities

At module level there is devolved responsibility to Module Leaders for the following:

- The maintenance and development of teaching and learning materials for all students enrolled on the module
- The publishing and updating of module timetables, which shall include a weekly schedule of module sessions and required reading, to be distributed to students at the start of all modules
- The setting, marking and collation of marks for all module assessments and examination papers, including resit assessments, and submission of student results to the Programme Leader
- Tutorial support for students taking the module which they are responsible
- Quality monitoring, including processing of annual student feedback questionnaires and, where appropriate, feedback for individual modules
- Liaison with part-time members of staff involved in module teaching

Student Feedback

The University has procedures for the regular review of its educational provision, including the annual review of modules and programmes, which draw on feedback from such sources as external examiner reports, student evaluation, student achievement, and progression data. In addition, programmes are subject to a programme periodic review (PPR) and re-validation in year 5 that includes external input.

Feedback from students plays a critical part in informing the Faculty's strategic thinking. It also allows the Faculty to evaluate how its most important group of stakeholders, its students, views its service provision. Students can provide feedback in a number of ways, for instance:

Student Voice Forum (SVF): Chaired by a member of academic staff from outside the programme, will be held at least once per semester. The Chair will minute student feedback for action/response by the Programme Leader. Minutes of the
SVFs and the response from the Programme Leader will be posted on the programme pages of Moodle. All programmes have representation at SVFs.

Student Evaluation of Modules (SEM): Module Leaders will distribute SEMs at the end of each module. A summary of the analysis of the SEMs, along with any other feedback (e.g. from the student suggestion box), will be passed to the Programme Leader for action/response.

Feedback on assessed work: Students submit work in a number of different ways depending on the module being studied. Wherever possible Moodle is used for electronic submission and Turnitin to check the similarity score and tutors give feedback via this interface within 3 working weeks. Practical work is developed and assessed by having students demonstrate their work, again immediate feedback is given. At the end of a module, overall feedback is provided along with a clear indication of what area the student needs, if necessary, to resubmit or what areas were good and which areas can be improved on.

32 Research and scholarship activity

Research within the programme team is co-ordinated at a Faculty level via the Arts, Science and Technology Research Centre. However, at a local level this manifests itself through the Applied Research in Computing Laboratories (ARClab) group. ARClab's research encompasses the broader computing subject and is concentrated in the following areas:

- IoT, Networking and Cybersecurity
- Audio and Affective Computing
- Health and Assisted Living Technologies
- HCI, Augmented and Virtual Reality
- CAD/Engineering software
- MIS/Business
- Ethics/professionalism
- Robotics/AI

ARClab has taken over from the previous Computing research groups of Creative and Applied Research for the Digital Society (CARDS) and the Centre for Applied Internet Research (CAIR), which built up their activities very impressively over the past ten years. The commitment and enthusiasm of the staff is very evident and significant outputs have been achieved over a whole range of activities, covering publications, grant winning, conference organisation, industrial engagement etc.

In the 2014 Research Excellence Framework (REF 2014), the Faculty's submission to the Computer Science and Informatics category received a grade point average of 2.04, with over two-thirds of all research scoring 2* or higher.

Significant achievements during the recent past include the very professional organisation of a conference to the highest international standards; the development of a large-scale EU-funded research project, the steady production of conference publications, in addition to a sound proportion of academic journal publications; the setting up of a usability laboratory - a relatively unique facility in Wales; the importing of a substantial new base of specialism in wireless technologies and a success in a radio frequency identification tagging (RFID) project, which is intended to be rapidly grown into an additional research theme.

33 Learning support

Institutional level support for students

The University has a range of departments that offer the support for students as:

- Library & IT Resources
- The Assessment Centre
- DisAbility Support Team
- Irlen Centre
- Careers Centre and Job Shop
- Zone Enterprise hub
- Chaplaincy
- Counselling & Wellbeing
- Student Funding and Welfare
- International Welfare
- Student Programmes Centre

- Glyndŵr Students' Union

Faculty support for students

All students at Wrexham Glyndŵr University are allocated a Personal Tutor whose main responsibility is to act as the first point of contact for their personal students and to provide pastoral and academic support throughout their studies at the University. It is a vital role to support student engagement and retention, and to help every student to success to the best of his or her ability.

Programme specific support for students

Induction
New students on the programme will undergo an induction programme that will provide them with a full introduction to the programme, and will include elements of work on study skills and professional development.

Student Handbook
All students on the programme will receive a Student Handbook, provided electronically via the VLE, which will contain details and guidance on all aspects of the programme and forms of student support and guidance, programme-based, and Faculty-based.

Computing Labs
The majority of Computing provision is located on the Wrexham campus, including teaching rooms, lecture theatres, staff offices, and specialist labs. There are a number of specialist computer labs on the Wrexham campus, including general purpose computing laboratories that support the teaching. These specialist labs offer access to a range of software that is utilised within the modules defined in the programme.

Open Door Policy
Computing operates an Open Door policy, meaning that academic staff are readily and easily accessible and approachable for students outside of scheduled learning and teaching hours. Staff can be approached without the need for a formal appointment to be made.

Progress Review and Attendance Monitoring
Student attendance will be subject to regular monitoring through registers, and this will be a means of addressing issues of student support. There will also be regular reviews for each student with personal tutors.

34 Equality and Diversity

Glyndŵr University is committed to providing access to all students and promotes equal opportunities in compliance with the Equality Act 2010 legislation. This programme complies fully with the University's Equal Opportunities Policy (http://www.glyndwr.ac.uk/en/AboutGlyndwrUniversity/Governance/TheFile,64499,en.pdf), ensuring that everyone who has the potential to achieve in higher education is given the chance to do so.