

PROGRAMME SPECIFICATION

Awarding body/institution	Glyndŵr University
Teaching institution (if different from above)	N/A
Details of accreditation by a professional, statutory or regulatory body (including link to relevant website)	N/A
What type of accreditation does this programme lead to?	N/A
Is accreditation in some way dependent on choices made by students?	N/A
Final award/s available eg BSc/DipHe/CertHE	BSc (Hons), BSc Ordinary, DipHE
Award title	BSc (Hons) Informatics
JACS 2 code	
UCAS code	
Relevant QAA subject benchmark statement/s	Computing
Other external and internal reference points used to inform the programme outcomes	The following reference points were used in designing the programme: QAA Framework for Higher Education Qualifications in England, Wales and Northern Ireland QAA guidelines for programme specifications QAA Code of Practice for the assurance of academic quality and standards in HE University's Regulations
Mode/s of study (p/t, f/t, distance learning)	Full time
Language of study	English
Date at which the programme specification was written or revised	September 2014

Criteria for admission to the programme

Entry requirements are in accordance with the University regulations.

The Informatics programme is designed to allow direct entry at level five and six. It is especially for students who have completed at least two years of University or Higher Education study and already hold a qualification in Computing or a related subject.

Academic requirements are:

From the UK: a Foundation Degree or HND: 240 credits

From other countries: a two year bachelor's degree or diploma, equivalent to the above.

Applicants meeting the above criteria may be eligible to join the programme at level 5 or level 6. Direct entry to level 6 will be considered on an individual basis by the programme team, and will be subject to the applicant demonstrating that they have covered relevant content at an appropriate level.

Other learning and experience may be considered for entry to the programme. A student may be allowed entry to a course if he or she does not have the standard entry qualifications but can provide evidence of necessary knowledge and skills to successfully enter and complete the course.

In addition to the academic entry requirements, overseas students require an IELTS score of 6.0 (with no sub-part less than 5.5): this should have been achieved within the two years prior to application.

Introduction

This document describes the rationale and structure of a programme for the award of BSc (Hons) Informatics and the modular framework within which it will be managed and delivered.

The aim of this validation document is:

- to provide information that is required by the validating group that is not available elsewhere
- to pinpoint the main differences between the current programmes relating to the computing department
- to present a rationale for the design decisions that have been taken in the development of the new programme.

The department of Computing has reviewed its existing portfolio and has restructured this provision recognising that for a strong and viable future, responsiveness to market demand and effective delivery are vital. This is one of ten new programmes designed to build an increasingly dynamic and sustainable future for Computing.

The Informatics degree programme has been designed as a top-up programme aimed at attracting non UK, European students who have existing credits from their home study.

The computing department has a long history of involvement in the recruitment and education of European students. Previously, individual agreements with specific partner institutes had allowed direct entry at levels 5 & 6 of a normal 3 year computing programme with appropriate previous programmes of study. The introduction of this new Informatics programme will

provide the flexibility of access to the full range of computing expertise and module choice available within the department's suite of undergraduate programmes.

The computing department works with a number of institutions across Europe and expects that this number will continue to increase as the programme gains recognition among an increasingly large set of new potential partner institutions

The programme has been specifically designed for students who have completed at least two years of higher educational study in a non UK EU institution. Their study is used as entry to the programme, or to APL credit for direct entry to Level Six in line with the University's APL procedures and on the recommendation of the programme team.

Aims of the programme

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 Computer Science field develops and changes continually and rapidly. Students studying this programme 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.

The Informatics programme draws on the range of computing expertise and module choice available within the department's suite of undergraduate programmes. The programme provides knowledge and understanding of theory and practice in a range of computing disciplines. It aims to produce graduates who are knowledgeable of current and emergent technologies, and are able to demonstrate knowledge and understanding of computing in the field and specialism that they have partly chosen through the optional modules offered. Students will further develop their skills to become competent practitioners in using, developing and managing modern computer / information systems.

Additionally, the programme will aim to develop students' critical abilities and general problem solving skills and lay a foundation for continuing education and self-improvement.

The course is practical in nature and its general aims are to:

- Provide the knowledge of the concepts, principles and practice from a range of discipline areas within the computing field.
- Develop the student's creative abilities through practice and evaluation of that practice, while also developing their critical understanding in the area of their choice
- Develop the student's understanding and awareness of theory and practice in their chosen area of the computing
- Stimulate an enquiring, creative, and reflective approach that encourages independent judgement and critical awareness
- Provide students with transferable skills, such as oral and written communication, time management and group working, to assist students in subsequent employment or further study
- Ensure that students have the basis for both future personal development and for continuing professional development.

Distinctive features of the programme

This Informatics programme is specifically designed for those who have completed at least two years of University or Higher Education study in a related subject. The purpose of the course is to provide the student with core skills in computer systems development, with particular focus on the use and deployment of current and emerging technologies. The course aims to prepare students for a career in the computing and information technology industries; to provide them with an awareness of professional standards of conduct and practice; and to provide them with the ability to apply their skills, knowledge and understanding to a variety of computing problems and contexts and develop computer applications and management support systems.

The programme is the most flexible degree on offer in the department. The course is designed to allow subject specialisation towards a range of subject areas across the computing curricula. The stages of the course draw entirely on existing modules offered within the Computing undergraduate curriculum. This allows effective utilisation of existing expertise and the range of options offered to students. This is achieved through a process of advice to and negotiation with students. Through this negotiation, students are guided toward a course of study to suit their existing knowledge and possible career aspirations

The structure of the course maximises student choice, while ensuring acquisition of a balance of knowledge and skills relevant to an award in Computing.

Programme structures and requirements, levels, modules, credits and awards

Module List

Module Title	Core/ Optional	Level	Module Code*	Credit Value
Project (EU)	C	6	COPM637	40
IT Project Management	C	6	COM614	20
21st Century Computing	C	6	COM623	20
Distributed Data	O	6	COM636	20
Network Management	O	6	COM635	20
Applied Network Security	O	6	COM634	20
Telecommunications Management	O	6	COM633	20
Advanced 3D Modelling & Animation	O	6	COM632	20
Collaborative Technology	O	6	COM631	20
Advanced Mobile Development	O	6	COM630	20
Advanced Web Technology	O	6	COM629	20
Applied Data Mining	O	6	COM628	20
Computability and Optimisation	O	6	COM627	20
Singularities and Society	O	6	COM626	20

Windows & Web based Application Development	O	6	COM616	20
Group Project Implementation	C	5	COM530	20
Group Project Design	C	5	COM529	20
Artificial Intelligence	O	5	COM521	20
Serious Games Technology	O	5	COM522	20
3D Modelling & Animation	O	5	COM505	20
Audio Technology for Games	O	5	COM503	20
Internet & Mobile App Development	O	5	COM502	20
Server Technology	O	5	COM523	20
Data Communications and Networks	O	5	COM524	20
Student Initiated Module (SIM5)	O	5	COM525	20
Applied Programming	O	5	COM526	20
Human Computer Relationships	O	5	COM527	20
Responsible Computing	C	5	COM528	20
CCNA Routing and Switching: Connecting Networks	O	5	COM531	20
CCNA R&S Scaling Networks	O	5	COM532	20
Databases and Web-based Information Systems	O	5	COM533	20
Agile Application Development	O	5	COM518	20
Database Administration and Optimisation	O	5	COM519	20

All modules are 20 credits apart from the Level 6 honours Project (EU) module (40 credits).

The Informatics programme is studied over one or two years depending on the level of entry. The academic year runs from September to May. The course is divided into modular study units, each of 20 credits apart from the Project (EU) which is 40 credits. Students complete 120 credits at each level 5 and 6. Each 20 credit module represents 200 hours of student learning and assessment.

Indicative Delivery Schedule

The following programme structure diagrams show the delivery models for both levels of entry

BSc Informatics Structure – level five entry

Informatics			
Level 6 Trimester 2	21 st Century Computing	Project (EU)	
Level 6 Trimester 1	IT Project Management	Level 6 Option	Level 6 Option
Level 5 Trimester 2	Group Project Implementation	Responsible Computing	Level 5 Option
Level 5 Trimester 1	Group Project Design	Level 5 Option	Level 5 Option

BSc Informatics Structure – level six entry

Informatics			
Level 6 Trimester 2	21 st Century Computing	Project (EU)	
Level 6 Trimester 1	IT Project Management	Level 6 Option	Level 6 Option

Composition of Awards and Progression

To be awarded the BSc (Hons) Informatics, students need to have accumulated 120 Level Five and 120 Level Six credits.

In order to gain a BSc (Ord) informatics, students need to have accumulated 120 credits at Level Five and 60 credits at Level Six (including the IT Project Management module).

In order to gain a Diploma of HE in Informatics, students need to have completed 120 credits at Level Five.

Intended learning outcomes of the programme

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills and other attributes in the following areas.

The following reference points were used to inform the development of the programme and its learning outcomes:

- the University's vision and core strategic aims, teaching and learning strategy and policies;
- the QAA benchmark statement for Computing;
- the Framework for Higher Education Qualifications in England, Wales and Northern Ireland;
- the Credit and Qualification Framework for Wales (CQFW);
- current needs of the local, national and international computing industry;
- current research and other scholarship carried out by academic staff;
- subject benchmark statement for Computing;

The following Informatics programme learning outcomes are met through the overall design and selection of modules. Graduates will be able to demonstrate the following:

A. Knowledge and understanding

A1	A critical appreciation of the facts, concepts, principles and theories relating to computing and computer applications as appropriate to the programme of study.
A2	The range of tools necessary to develop computational solution
A3	Industry standards for software confirmation, operation and testing
A4	Recognition of professional considerations involved in the sustainable exploitation of computer technology and is guided by the adoption of appropriate professional, ethical and legal practices.
A5	Working in collaborative teams, partnerships and industry networks

B. Intellectual skills

B1	Identify, select and apply appropriate computational system development models and processes
B2	Develop cognitive skills of critical thinking, analysis and synthesis
B3	Select and apply suitable software development models and processes
B4	Apply industrial standards to software performance, interoperability and evaluation.
B5	Critically appraise the environment, industry and work place; identifying opportunities and threats.

C. Subject specific skills

C1	Utilise appropriate research methods for presentation, analysis and interpretation of both qualitative and quantitative data, relevant to the discipline.
C2	Work collaboratively in teams and with potential partners in industry.
C3	Students are required to develop technical skills. This involves the students engaging in practical and project work throughout the course. This work is actively integrated to ensure that students relate theory and analysis to the design, operation and maintenance of computer software systems

D. Practical, Professional and Employability skills

D1	Written communication skills: Research, analyse and interpret information from a variety of sources and synthesise and communicate ideas effectively both orally and in writing
D2	Numeracy
D3	Multidisciplinary teamwork skills: actively participate in groups and also be capable of independent work.
D4	Information and communications technology skills
D5	Cognitive skills: Critically assess the relevance and importance of ideas of others
D6	Managing own learning: evaluate own performance and working standards and manage own learning and continuing professional development and develop lifelong learning skills

A. Knowledge and understanding

		Level 5 Dip He	Level 6 Degree	Level 6 Honours Degree
A1	A critical appreciation of the facts, concepts, principles and theories relating to computing and computer applications as appropriate to the programme of study.	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 range of tools necessary to develop computational solution	Demonstrate an ability to apply a range of programming tools and techniques in new contexts from that in which they were first studied at level 4, in the design of 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.	Increasingly independent, confident and flexible 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	Industry standards for software confirmation, operation and testing	Demonstrates a widening appreciation of some of the tools, practices and methodologies used in the specification, design, implementation and testing of computer software systems; understand the risks of software implementation, Demonstrate a working of the general rules and	Select and deploy accurately established techniques and methods used in 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-	Increasingly independent, confident and flexible in applying a range of methods used in defining and assessing criteria for measuring the extent to which a computer system is appropriate for its current deployment and future evolution; understand the risks of software

		best practices adopted and knowledge of software testing techniques	based strategies and policies for software testing.	implementation and apply risk-based strategies and policies for software testing.
A4	Recognition of professional considerations involved in the sustainable exploitation of computer technology and is guided by the adoption of appropriate professional, ethical and legal practices.	knowledge and understanding of the professional, economic, social, environmental, moral and ethical issues involved in the sustainable exploitation of computer technology	knowledge and a comprehensive understanding of the legal, professional, economic, social, environmental, moral and ethical issues involved in the sustainable exploitation of computer technology	Demonstrates confidence and reveals a comprehensive understanding of the legal, professional, economic, social, environmental, moral and ethical issues involved in the sustainable exploitation of computer technology
A5	Working in collaborative teams, partnerships and industry networks	Demonstrates more advanced interactive and group skills, including effective participation with others on a common task or group project.	The ability to work effectively with others on a common task; demonstrates basic negotiating skills in line with team objectives.	The ability to work effectively with others on a common task; taking actions which respect the needs and contributions of others; contributing to and accepting the consensus; negotiating to achieve the objectives of the team

B. Intellectual skills

		Level 5 Dip He	Level 6 Degree	Level 6 Honours Degree
B1	Identify, select and apply appropriate computational system development models and processes	Demonstrates increasing ability to apply the key concepts, principles, theories and practices to relatively simple situations, still with some guidance provided.	Recognises familiar ideas or principles in new contexts or situations; apply the key concepts, principles, theories and practices, systematically and effectively with minimal guidance.	Identifies and classifies principles and ideas in new contexts and situations; creatively apply the key concepts, principles, theories and practices, systematically, effectively and critically, working autonomously.

B2	Develop cognitive skills of critical thinking, analysis and synthesis.	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.
B3	Select and apply suitable software development models and processes	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	Apply industrial standards to software performance, interoperability and evaluation	Starts to develop own criteria and develops ability to form independent judgements, although still dependent on guidance from tutors.	Identifies a range of valid alternative solutions; begins to discriminate and evaluate in a reasoned, systematic and increasingly independent way.	Integrates theory with good computing practice; autonomously evaluates theory, process, solutions and outcomes critically and effectively.
B5	Critically appraise the environment, industry and work place; identifying opportunities and threats	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	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

		accurately and reliably, and with structured and coherent arguments.		
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C. Subject specific skills

		Level 5 Dip He	Level 6 Degree	Level 6 Honours Degree
C1	Utilise appropriate research methods for presentation, analysis and interpretation of both qualitative and quantitative data, relevant to the discipline.	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 some guidance provided as appropriate.	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 new concepts, working autonomously.
C2	Work collaboratively in teams and with potential partners in industry.	Demonstrates more advanced interactive and group skills, including effective participation with others on a common task or group project.	The ability to work effectively with others on a common task; demonstrates basic negotiating skills in line with team objectives.	The ability to work effectively with others on a common task; taking actions which respect the needs and contributions of others; contributing to and accepting the consensus; negotiating to achieve the objectives of the team
C3	Students are required to develop technical skills. This involves the students engaging in practical and project work throughout the course.	Students will deepen their knowledge of practical concepts and approaches for systems development, information structure, and applications. At this level, students will also be introduced to professional, legal and ethical issues relevant to	Students will learn key skills of cooperation, organisation, communication, negotiation and teamwork. On successful completion of this stage, the student will be able to: Design and implement	Students will achieve effective use of investigative and design strategies, and the integration of these strategies with other tools and methodologies. These skills will be particularly demonstrated in the students'

		<p>the computing and IT industry.</p> <p>On successful completion of this level, the student will be able to:</p> <p>Undertake the requirement specification and design of a computing/I.T. system using a variety of tools and techniques.</p> <p>Co-operate in an effective manner with colleagues and other professionals through the development of interpersonal and communication skills, within in a project and business context.</p> <p>Display knowledge and understanding of systems development and professional issues.</p>	<p>interactive systems that manage information in a variety of media types.</p> <p>Utilise a range of tools and techniques to develop information systems that make effective use of current technologies.</p>	<p>management of an individual project.</p> <p>The final year practical and project work will require the type of evaluation of technical and non-technical factors and the management of methodologies and progress which IT professionals exercise early in their careers.</p> <p>On successful completion of this stage, the student will be able to:</p> <p>Analyse and critically appraise current and emerging technologies.</p> <p>Propose, plan, undertake and report a self-directed individual programme of investigation, design and implementation which will enable the effective use of self-directed investigative, design and other technical skills to be demonstrated through the management of an individual computing project.</p> <p>Demonstrate knowledge and understanding of project management techniques</p>
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D. Practical, Professional and Employability skills

		Level 5 Dip He	Level 6 Degree	Level 6 Honours Degree
D1	Written communication skills: Research, analyse and interpret information from a variety of sources and synthesise and communicate ideas effectively both orally and in writing	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.	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.	Engages effectively in independent roles; debates in a professional manner; produces detailed critiques and coherent technical and project reports; gives confident oral and other presentations in a wide range of contexts.
D2	Numeracy	Demonstrates more advanced standard numerical/ mathematical skills as appropriate to their chosen specialist subject.	Applies a range of more specialist numerical/ mathematical skills as appropriate to their specialist subject.	Confidently applies a range of specialist numerical/ mathematical skills as appropriate to the specialist subject area.
D3	Multidisciplinary teamwork skills: actively participate in groups and also be capable of independent work	Demonstrates more advanced interactive and group skills, including effective participation in more demanding group tasks, including a group project.	Interacts effectively within a learning or subject-specific group, including a work-experience 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.
D4	Information and communications technology skills	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	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	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

		effectively to gain information.	and critically evaluate their merit	specific purpose and critically evaluate their merit
D5	Cognitive skills: Critically assess the relevance and importance of ideas of others	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
D6	Managing own learning: evaluate own performance and working standards and manage own learning and continuing professional development and develop lifelong learning skills	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.

CURRICULUM MATRIX demonstrating how the overall programme outcomes are achieved and where skills are developed and assessed within individual modules.

		Knowledge and understanding, intellectual skills, subject skills, and practical, professional and employability skills																			
Module Title	Core/ Opt	A 1	A 2	A 3	A 4	A 5	B 1	B 2	B 3	B 4	B 5	C 1	C 2	C 3	D 1	D 2	D 3	D 4	D 5	D 6	
L 5	Group Project Design	C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Group Project Implementation	C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Responsible Computing	C	X	X	X	X	X	X	X			X	X		X	X			X	X	X
Module Title	Core/ Opt	A 1	A 2	A 3	A 4	A 5	B 1	B 2	B 3	B 4	B 5	C 1	C 2	C 3	D 1	D 2	D 3	D 4	D 5	D 6	
L 6	IT Project Management	C	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Project(EU)	C	X	X	X	X		X	X	X	X	X		X	X	X	X	X	X	X	X
	21st Century Computing	C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Module tutors

Module Title	Level	Module Leader
21st Century Computing	6	Vic Grout
Advanced 3D Modelling & Animation	6	Richard Hebblewhite
Advanced Mobile Development	6	Jason Matthews
Applied Data Mining	6	Renato Amorim
Applied Network Security	6	Vic Grout
Collaborative Technology	6	Richard Hebblewhite
Computability and Optimisation	6	Bo Liu
Distributed Data	6	Bindu Jose
Network Management	6	Nigel Houlden
Project (EU)	6	Vic Grout
IT Project Management	6	Denise Oram
Singularities and Society	6	Denise Oram
Telecommunications Management	6	John Davies
Advanced Web Technology	6	John Worden
Windows & Web based Application Development	6	John Worden
3D Modelling & Animation	5	Nathan Roberts
Applied Programming	5	John Worden
Artificial Intelligence	5	Renato Amorim
Audio Technology for Games	5	Richard J Smith
Data Communications and Networks	5	John Davies
Group Project Design	5	John Worden
Group Project Implementation	5	John Worden
Human Computer Relationships	5	Rich Picking
Internet & Mobile App Development	5	Jason Matthews

Responsible Computing	5	Denise Oram
Serious Games Technology	5	Nathan Roberts
Server Technology	5	Nigel Houlden
SIM5	5	John Worden
CCNA Routing and Switching: Connecting Networks	5	John Davies
CCNA R&S Scaling Networks	5	John Davies
Databases and Web-based Information Systems	5	John Worden
Agile Application Development	5	John Worden
Database Administration and Optimisation	5	Bindu Jose

There may be additional deliverers but those individuals listed above are identified as the Module leaders.

Learning and teaching strategy used to enable outcomes to be achieved and demonstrated

The Computing department recognise the need to develop more flexible programmes that meet the needs of a more diverse student body. These programmes are designed to offer a wider variety of provision for students with different demands and commitments.

The Department of Computing is known for its flexible approach with a Learning, Teaching and Assessment implementation plan aligned to wider University developments. However, the core of our strategy seeks to assist the student to become an independent learner whilst still supporting the students in their transition to higher education. The curriculum is designed to encourage an appreciation for learning. Learning is enriched by appropriate underpinning, current research, industrial applications and the development of transferable skills.

The learning and teaching strategy deployed will be suitable to maximise opportunities for attainment of the programme aims. The strategy aims to:

1. have a continued emphasis on student-centred learning;
2. employ teaching methods that promote effective student learning, self-development and reflection;
3. promote active learning throughout the course, e.g. theoretical concepts being delivered in a framework of lectures, practical demonstrations and workshops applying theory to practice using activity based assignments;
4. deploy a variety of learning and teaching methods including:
 - Lectures - This is usually a formal discourse for the purposes of dissemination of information, the demonstration of techniques and the discussion of supporting ideas and consequences. The lecture is supported by a full range of equipment including blackboard, whiteboard, video and computer projection facilities where appropriate. Although this type of presentation is suitable for a one-sided discourse ample opportunity exists for questions, interaction and discussion.
 - Seminar and Tutorials - These activities encompass a wide range of activities, each suited to the particular module. On the one hand, some tutorials will consist of the staff supporting students engaged in problem solving. On the other hand a tutorial may involve group exercises where each group is encouraged to allocate responsibilities, allocate tasks, etc. Generally, this type of teaching is used to

support the lecture, clarify the material and experiment with the techniques and skills required.

- Laboratory – The nature of the computing elements of all courses requires students to gain practical skills in the use of a personal computer. This activity takes place in one of the Computing Department's four computer laboratories and consists of the student, supported by a staff member, practising skills in the use of sophisticated software applications and including software development and systems analysis and design tools.
- Group Work – specifically with the group project but also on other modules, students are encouraged to work in groups to achieve set objectives. Assessment of these activities includes both group and individual elements. In this way, students learn to work as a team to achieve a common goal whilst at the same time individual contribution is recognised and evaluated.
- Group Project – All students joining the programme at level 5, participate in two twenty credit modules; Group Project Design and Group Project Implementation. Teamwork (group work) has been identified as one of the fundamental skills sought by employers. The modules are designed to develop communication and other interpersonal skills such as negotiation, influence, advising, interpreting and planning to work efficiently within a group. The group may comprise peers across a cohort of students but could equally comprise a work based group (team) working on a commercial project.
- Project (EU) - All students complete a 40 credit individual project at level 6. This project will include practical as well as academic components enabling students to further improve their employability as well as academic writing.

The overall purpose of the project is to prepare the students for the kind of tasks and situations they may encounter in the workplace when they graduate and find their first employment. It provides the opportunity for the student to undertake the research and self-management of a Computing related realistic problem within a wider European environment. Students are expected to develop their own professional and ethical perspectives through their research and understanding of the dilemmas associated with information and digital media in relation to their chosen project scope. Typical research topics include: copyright, privacy, data protection, media regulation, ownership and economics of information. An essential outcome for this module is that the student project deliverable includes a system, application or novel approach that both relates to the main areas of student study, and that can be used, applied or demonstrated in some way. The project also provides the student with an opportunity to specialise in an area of personal interest.

This approach is intended to:

1. strike a balance between 'class' activity and directed study 'out of class';
2. provide sound feedback to students and attempt to involve them in identifying their own learning needs;
3. use directed and supported group work for sharing experience and knowledge and developing interpersonal skills;
4. provide realistic and relevant learning activities;
5. make use of a variety of assessment methods to allow students the opportunity to demonstrate their own particular capabilities.

Full use of Moodle will be made as a way of helping to manage teaching and learning, and to keep in contact with students. Each programme and module within a programme has its own space on Moodle. A wide range of information is placed within each of these areas for students to access. General information such as the module handbook will be placed into the programme area, and lecture notes together with activities for completion such as directed reading and worksheets will be placed into module spaces. Lecture notes will be either posted 24hours prior to the lecture or immediately after, dependent on the preference of the member of staff.

Moodle will be also an effective way of keeping in contact with students by posting messages, for example informing students on arrangements for guest speaker visits.

See overleaf for Trimester Delivery Schedule

2014/15 Academic Year Calendar -Framework				
<i>Timetable week number</i>	<i>Date</i>	<i>trimester teaching weeks</i>	<i>single intake programmes - students</i>	<i>single intake programmes - staff*</i>
1	28-Jul-14			
2	04-Aug-14			
3	11-Aug-14			
4	18-Aug-14			
5	25-Aug-14			
6	01-Sep-14			
7	08-Sep-14			
8	15-Sep-14			
9	22-Sep-14	1	Teaching/induction	Teaching/induction
10	29-Sep-14	2	Teaching	Teaching
11	06-Oct-14	3	Teaching	Teaching
12	13-Oct-14	4	Teaching	Teaching
13	20-Oct-14	5	Teaching	Teaching
14	27-Oct-14	6	Teaching	Teaching
15	03-Nov-14	7	Teaching	Teaching
16	10-Nov-14	8	Teaching	Teaching
17	17-Nov-14	9	Teaching	Teaching
18	24-Nov-14	10	Teaching	Teaching
19	01-Dec-14	11	Teaching	Teaching
20	08-Dec-14	12	Teaching	Teaching
21	15-Dec-14	13	Teaching	Teaching
22	22-Dec-14		Christmas vacation	Christmas
23	29-Dec-14		Christmas vacation	Christmas
24	05-Jan-15	1	Teaching	Teaching
25	12-Jan-15		University Exams	University Exams
26	19-Jan-15	2	Teaching	Teaching
27	26-Jan-15	3	Teaching	Teaching
28	02-Feb-15	4	Teaching	Teaching
29	09-Feb-15	5	Teaching	Teaching
30	16-Feb-15	6	Teaching	Teaching
31	23-Feb-15	7	Teaching	Teaching
32	02-Mar-15	8	Teaching	Teaching
33	09-Mar-15	9	Teaching	Teaching
34	16-Mar-15	10	Teaching	Teaching
35	23-Mar-15	11	Teaching	Teaching
36	30-Mar-15		Spring Vacation	Spring Vacation
37	06-Apr-15		Spring Vacation	Spring Vacation
38	13-Apr-15	12	Teaching	Teaching
39	20-Apr-15	13	Teaching	Teaching
40	27-Apr-15		University Exams inc Saturday	University Exams inc Saturday
41	04-May-15		University Exams Tues/Wed Marking Thur/Fri	University Exams Tues/Wed Marking Thur/Fri
42	11-May-15		Additional Study weeks*	Marking /Pre board
43	18-May-15		Additional Study weeks*	Module board
44	25-May-15		Additional Study weeks*	Progression & Award Board

The university's adoption of a trimester system divides the academic year into three periods of 13 teaching weeks. Typically, a 20 credit module specification will specify the module duration as 200 hours, of which the scheduled learning and teaching hours total 60 hours and the independent study hours total 140 hours. This delivery pattern is recognised by the department as being appropriate for modules that are both academically and technically demanding and

challenging. However, the GU Wrexham, programme team has discussed contact hours in detail and feels that in order to provide our students with the best opportunity the department will deliver modules with the following contact hours. The delivery is based on a delivery schedule of 12 weeks, allowing for a study break.

Level 5 = up to 5 hours per week per module

Level 6 = up to 4 hours per week per module

The Department also recognises that some modules such as the project, are more students focused and directed and therefore do not require the same level of staff contact.

Welsh Medium Provision

All students have the opportunity to submit assessment in Welsh, in line the University's Welsh Language Policy. Currently, 0% of the programme can be delivered in Welsh.

Assessment strategy used to enable outcomes to be achieved and demonstrated

The approach to assessment has been guided by the QAA Code of Practice for the assurance of academic quality and standards in Higher Education (2006) (Section 6: Assessment of students) and Glyndŵr University Assessment Guidelines.

Students will be bound by the general assessment regulations of the University. The University regulations provide a framework for the assessment of students' competence, knowledge and understanding, and the grading of students for progression and the conferring of awards. It allows staff to give feedback to students and to evaluate the effectiveness of their own teaching.

Students will receive formative assessment, particularly during the practical and self-study elements of the programme to ensure they can keep track of their progress and development. This will also be a key factor in ensuring student engagement and retention on the programme of study. In the case of practical assessment, this may be a final summative assessment, so more frequent formative assessment provides academic rigour and increases student awareness and confidence in the subject.

The practical nature of the programme is reinforced through the importance of coursework as part of the learning process and assessment. Despite the importance of their theoretical basis, many of the concepts can often best be grasped by practical exercises and assignments. The coursework of a module typically carries 50% weight of the assessment, although this varies with modules assessed entirely by coursework.

Practical coursework includes:

- exercises for private study or in practical/tutorial classes
- exercises in computing laboratories
- programming exercises and projects
- team and individual projects

In the process of formulating the proposed assessment strategy, the programme team discussed at length, the number of, and the types of assessment most appropriate for the programmes. The general view of the team is that where it is appropriate to do so, the learning outcomes may be assessed with each element of assessment. The module learning outcomes indicate to the student what they are expected to know and how they are expected to demonstrate that knowledge in their assessment tasks. The programme team recognise that

when determining the types of assessment tasks that will align with the modules learning outcome statements they consider that one task can cover more than one learning outcome and a learning outcome can be assessed more than once. Assessing a learning outcome more than once provides an opportunity for feedback and further learning (such as in an assessment task during the trimester, and then again, in a different way, in a final test or assignment). While not intending to submit the programme for accreditation, this approach is also supported by the British Computer Society (BCS), whose expectations have been used as a benchmark to develop the programme. Guidance given to BCS assessors suggests that key criteria from the BCS required lists should be 'embedded' in each programme rather than 'included superficially'. Also these terms are not precisely defined; unofficial guidance to assessors is that this should mean that a number of key criteria, when traced down through module specifications into assignments, should be seen to be assessed at least twice.

There will be emphasis placed upon students to undertake independent study and research activities, in particular when completing the Project element of the course. This Project will be facilitated by a traditional summative assessment approach at the culmination of the work, however, there will be extensive use of formative feedback, milestones, and guidance from staff during this, and other, independent-study and research-based assessment undertaken by students.

Feedback is provided continuously to students through informal contact with subject lecturers and tutors in the seminar/tutorial and laboratory settings. In accordance with University Guidance, feedback is provided on assessed practical work normally within three weeks of submission of the work.

An overview of the assessment details will be provided in the Student Handbook and full details of the assessment criteria for each module is provided in the module descriptor which forms part of the module pack available to students.

Module Assessment

Level	Module Title	HE Credit	Assessment Type	Weighting	fulltime Submission
6	21st Century Computing	20 Core	Presentation Report	30% 70%	Trimester 1 - Mid Trimester 1 - End
6	Advanced 3D Modelling & Animation	20 Option	Coursework	100%	Trimester 1 - End
6	Advanced Mobile Development	20 Option	Coursework Coursework	50% 50%	Trimester 1 - Mid Trimester 1 - End
6	Applied Data Mining	20 Option	Group Project In-class test	50% 50%	Trimester 1 - Mid Trimester 1 - End
6	Applied Network Security	20 Option	Examination Coursework	50% 50%	Trimester 1 - Mid Trimester 1 - End
6	Collaborative Technology	20 Option	Coursework Coursework	50% 50%	Trimester 1 - Mid Trimester 1 - End
6	Computability and Optimisation	20 Option	Examination Project Presentation	40% 50% 10%	Trimester 1 - Mid Trimester 1 - End Trimester 1 - End
6	Distributed Data	20 Option	Coursework	100%	Trimester 1 - End
6	Network Management	20 Option	In-class test Coursework	50% 50%	Trimester 1 - Mid Trimester 1 - End
6	Project (EU)	40 Core	Coursework	100%	Trimester 2 - End
6	IT Project Management	20 Core	Coursework	100%	Trimester 1 - End
6	Singularities and Society	20 Option	Case Study Reflective Practice	40% 60%	Trimester 1 - Mid Trimester 1 - End
6	Telecommunications Management	20 Option	Coursework Report	60% 40%	Trimester 1 - Mid Trimester 1 - End
6	Advanced Web Technology	20 Option	Coursework Coursework	50% 50%	Trimester 1 - Mid Trimester 1 - End
6	Windows & Web based Application Development	20 Option	Practical	100%	Trimester 1 - End
5	3D Modelling & Animation	20 Option	Coursework	100%	Trimester 1 - End
5	Applied Programming	20 Option	Coursework	100%	Trimester 2 - End
5	Artificial Intelligence	20 Option	Group Project	50%	Trimester 1 - Mid

			Group Project	50%	Trimester 1 - End
5	Audio Technology for Games	20 Option			Trimester 1 - Mid Trimester 1 - End
5	Data Communications and Networks	20 Option	Coursework Examination	60% 40%	Trimester 1 - Mid Trimester 1 - End
5	Group Project Design	20 Core	Group Project	100%	Trimester 1 - End
5	Group Project Implementation	20 Core	Group Project	100%	Trimester 2 - End
5	Human Computer Relationships	20 Option	Report	100%	Trimester 1 - End
5	Internet & Mobile App Development	20 Option	Coursework Coursework	50% 50%	Trimester 2 - Mid Trimester 2 - End
5	Responsible Computing	20 Core	Coursework	100%	Trimester 1 - End
5	Serious Games Technology	20 Option	Coursework Coursework	50% 50%	Trimester 2 - Mid Trimester 2 - End
5	Server Technology	20 Option	Case Study	100%	Trimester 2 - End
5	SIM5	20 Option	Coursework	100%	Trimester 1 or 2 - End
5	CCNA Routing and Switching: Connecting Networks	20 Option	In-class test In-class test Coursework	40% 40% 20%	Trimester 2 - Mid Trimester 2 - End Trimester 2 - End
5	CCNA Routing and Switching: Scaling Networks	20 Option	In-class test In-class test Coursework	40% 40% 20%	Trimester 2 - Mid Trimester 2 - End Trimester 2 - End
5	Databases and Web-based Information Systems	20 Option	Coursework Group Project	50% 50%	Trimester 2 - Mid Trimester 2 - End
5	Agile Application Development	20 Option	Coursework	100%	Trimester 2 - End
5	Database Administration and Optimisation	20 Option	Coursework Coursework	50% 50%	Trimester 2 - Mid Trimester 2 - End

Assessment regulations that apply to the programme

Academic Regulations for Bachelor Degrees, Diplomas and Certificates apply to this programme.

In considering borderline cases the Assessment Board shall raise the classification to the next level if all of the following criteria are met:

- At least 50% of the credits at level 6 fall within the higher classification;
- All level 6 modules must have been passed at the first attempt;
- The mark achieved for the 40 credit Project module is within the higher classification.

Programme Management

This programme will be managed by the Undergraduate Programme Leader within the Computing department. Module tutors and the Undergraduate School Office will provide additional support.

Department student performance and monitoring meetings will take place where required and the programme team will be invited to attend the appropriate programme board meetings scheduled during each semester.

Programme team:

Prof Vic Grout – Head of Computing
John Worden – Undergraduate Programme Leader
John Davies
Denise Oram
Rich Hebblewhite
Nathan Roberts
Bindu Jose
Nigel Houlden
Rich Picking
Renato Cordeiro de Amorim
Bo Liu
Jason Matthews
Stephen Caulder
Clive Buckley

The Undergraduate Programme Leader will have overall responsibility for the operation and development of the course. He will work closely with Module Leaders, Module Tutors, Personal Tutors and Administrative Support personnel to provide the day to day general academic support to students. He will also meet regularly with the Academic Head of Computing.

The Undergraduate Programme Leader 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, 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 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, student feedback for individual modules
- Liaison with part-time members of staff involved in module teaching

The control of quality will conform to the procedures set out by Glyndŵr University's requirements for academic quality assurance, monitoring and review. The primary indicators of quality come through regular student feedback, module reviews, external examiners' reports, annual and periodic programme reviews and student surveys.

Methods for evaluating and enhancing the quality of learning opportunities

- Subject / Programme committees with student representation
- Module evaluations by students
- Students surveys, e.g. National Student Survey (NSS)
- Annual quality monitoring and action planning through the AMR process
- Peer review/observation of teaching
- The moderation of assessed coursework
- Student Representatives and Staff Student Consultative Committees
- Module, Progression and Award Boards
- External Examiners - External examiners are appointed for all programmes of study. They oversee the assessment process and their duties include: approving assessment tasks, reviewing assessment marks, attending assessment boards and reporting to the University on the assessment process.

Mechanisms for gaining student feedback

- Student Representation on Subject Board
- Staff Student Consultative Committees
- Module and Programme level student questionnaires

Staff Development Priorities

- Academic staff undertake activities related to research, scholarship, teaching and learning and student support and guidance
- Annual staff appraisals match development to needs
- New academic staff required to undertake PgCert in Professional Development in Higher Education.
- All academic staff are encouraged to seek Higher Education Academy membership

The Department believes that students learn best in a research oriented environment taught by people working at the forefront of their disciplines. The skills and expertise in the School are augmented by the presence of the Centre for Applied Internet Computing (CAIR) which has now been encompassed into the Creative and Applied Research for the Digital Society (CARDS) research Centre, where staff are researching in the areas of Computer Programming and Software Engineering, Science and Internet Technologies, Mobile Communications, Web systems, Security and Computer Forensics, Computer Graphics, Media Technologies, E-Commerce and business impact. Current research projects include:

- Computer Music and Audio
- Metrics for determining network stability
- Social and Behavioural Algorithms
- Computational mathematics
- Combinatorial optimisation and network algorithms
- Information Systems Failure
- Intelligent user interface design and adaptive tutoring systems
- Games Technology
- Routing algorithms and protocols
- Database optimisation
- Search engines
- Holistic visualisation of distributed knowledge
- Security and security visualization
- Complex decision analysis
- Wireless network optimisation
- Standardisation of reusable interface components
- Computing and Internet Ethics
- e-Learning/Business/Commerce
- Teaching and learning in IT
- Domotics and Remote-Controlled Home Automation Systems
- Document compression and transmission..

Staff on the programme team are very active in undertaking research, scholarship and professional activities, as reflected in an expanding published output, a significant grant-funded research project (and bids for new examples), growing numbers of Knowledge Transfer Partnerships, and the very successful conference series organised within the Research Centre. Staff are encouraged to undertake regular publication of academic papers and attendance of specialised conferences.

Particular support for learning

Support and guidance is available to students throughout the programme. Students have access to a great deal of guidance for students through the virtual learning environment (Moodle). In addition, they can also get help and guidance from their Programme Leader, Personal Tutor and Year Tutor. They can also get module specific advice from the Module Leader and any of the staff teaching on the relevant module.

Additional support mechanisms include:

- Extensive induction programme introduces the student to the University and their course. The programme will include course related issues, student support, library induction, study skills, career development etc.
- Each student has a personal tutor, responsible for pastoral support and guidance.
- University support services include - careers, financial advice, housing, study skills, counselling etc.

- Excellent library and Internet facilities.
- Student handbook provides information about course structures, University regulations etc.
- Transferable skills / Key Skills are usually incorporated into all modules.
- Written feedback is provided for all assessments usually within three weeks of the hand-in date.
- Open door policy throughout the departments.

Student Feedback

The programme team is committed to receiving and responding to student feedback in order to improve the quality of the student experience and development of learning and teaching. The core principle is that all students should have the opportunity to contribute to and enhance their experience. Student representation therefore, is crucial to ensure the opinions and concerns of the student body are communicated to staff. This is also key to ensure an efficient flow of communication from staff back to students.

Feedback from students plays a critical part in informing the programme team's strategic thinking. It also allows the team to evaluate how its service provision is viewed by its most important group of stakeholders, its students.

Students can provide feedback in a number of ways:

- The Staff-Student Consultative Committee (SSCC) chaired by the Programme Leader will be held at least once per trimester and involves elected student representatives from each cohort of study. The Chair will minute student feedback for action/response by the Programme Leader. Minutes of the SSCCs and the response from the Programme Leader are posted on the programme pages of Moodle.
- Student Evaluation of Module (SEM) – Students are encouraged to complete an on-line SEM midway and at the end of each module through Moodle. A summary of the analysis of the SEM, along with any other feedback, will be available to the Programme Leader for action/response. Student feedback is collected and reported as part of the Annual Monitoring Report (AMR) process.

Equality and Diversity

Glyndŵr University is committed to providing access to all students and promotes an equal opportunities statement including equal treatment for all applicants and students. This programme fully complies with the university's policy on Equality and Diversity.