

STUDENT HANDBOOK

BSc (HONS) Computing (Internet Systems) DIS

PROGRAMME: 6076

SCHOOL OF COMPUTING & INFORMATION ENGINEERING

FACULTY OF COMPUTING & ENGINEERING

COLERAINE CAMPUS

UNIVERSITY OF ULSTER

COURSE DIRECTOR: DR ADRIAN MOORE

SEPTEMBER 2010 ENTRY

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1. WELCOME

Computing is a field of study that has had an impact on society as great as, if not greater than, any other in the last forty years. Computing now affects the daily lives, either directly or indirectly, of many millions of people throughout the world. The wide, and ever increasing, availability of computers to those without specialist knowledge places a growing mantle of responsibility on those with specialist knowledge to ensure the development of high quality, robust and usable hardware and software systems.

This programme focuses on the development of software and hardware for a variety of application areas, whilst at the same time preparing the graduate for the inevitable changes in the field of computing. The inclusion of an industrial placement year prepares candidates for working careers in computing and sets their academic studies into the context of the variety of computer applications.

This programme is linked to other specialist programmes, or pathways. The 4 linked programmes are:

BSc Hons Computing DIS

BSc Hons Computing (Artificial Intelligence) DIS

BSc Hons Computing (Games Development) DIS

BSc Hons Computing (Internet Systems) DIS

All graduates from these programmes will have a high degree of skill in the development of quality software. The “core” of the programmes, essentially the first two years of study plus the final year project, will have prepared them for careers in software production in a variety of positions, including software houses, data processing and industrial computing.

Students taking any of the above programmes at Coleraine will share the same common first and second year of core material. The specialisation in the chosen pathway will occur in the final year, through a requirement to take specific modules and complete a substantial project in that subject. This will ensure that all graduates have core competencies in computing, while developing a specialism that will be attractive to particular employers.

1.1 Computing @ Coleraine

The Subject's overall aim is:

To strive to achieve excellence in learning, teaching, research and technology transfer for the benefit of individuals, employers and the wider community in Northern Ireland and elsewhere.

The Subject was selected for a Discipline Audit Trail (DAT) during the QAA Institutional Audit in 2005. The academic standards and the quality of the learning opportunities available to students were confirmed as appropriate.

The professional body for the Subject is the British Computer Society (BCS), which accredited/exempted programmes in November 2008. The Higher Education Academy National Subject Centre for Information and Computer Sciences is based on the Jordanstown campus of the University. This provides a rich source of resources, special events on topics such as assessment, group working and the teaching of programming.

The Subject is supported by Visiting Professors who contribute to the delivery of seminars and bring their particular expertise into the curricula. Visiting experts are invited from other institutions, industry and professional organisations to contribute to the teaching (e.g., on professional development modules). Additionally the Subject is advised by a Computing Industrial Liaison Panel which meets several times a year providing two-way communication between the Subject and industry. A representative of the umbrella organisation for the NI Software industry, Momentum, also sits on this panel. Evidence of the importance placed on the comments of this Panel includes the introduction of C++ into the curriculum and an increased attention given to the development of the students' general communication and other softer skills.

Following the decision to concentrate on advanced Masters programmes in line with the QAA Qualifications Framework, the Subject has enhanced and introduced a wider portfolio of such programmes reflecting the particular identity and strengths of each campus. This includes an MSc in Telecommunications and Internet Systems at Coleraine.

1.2 Course Team

	Name	Telephone	Room	Email
	Head of School			
Prof	Dave Bustard	24366/24440	D067B	dw.bustard@ulster.ac.uk
	School Secretaries			
Miss	Lyndsey Blair	24366	D067A	lj.blair@ulster.ac.uk
Ms	Jane Fraser	24440	D067A	j.fraser@ulster.ac.uk
Ms	Anne McMullan	24648	D092	a.mcmullan@ulster.ac.uk
Mrs	Pauleen Marshall	24366	D067A	p.marshall@ulster.ac.uk
	Technical Planning & Development			
Mr	Tony McLaughlin	24494	D061B	ja.mclaughlin@ulster.ac.uk
	Technical Services			
Mrs	Janet Allison (Software)	24243	D068	ja.allison@ulster.ac.uk
Mr	Nigel Creighton (Hardware)	24122	D068	nr.creighton@ulster.ac.uk
	Technician			
Mr	Steven Walmsley	23162	D050	steven@infclst.ac.uk
	Course Committee			
Prof	Dave Bustard	24366/24440	D067B	dw.bustard@ulster.ac.uk
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2. STUDENT SUPPORT

2.1 Induction Programme

All students registered on the Degree Programme will participate in a induction programme as outlined below.

WEEK	Topic	
0	Welcome & overview	Michaela Black, Year 1 Co-ordinator (at registration, 14 Sept)
0	Lab and E-Mail Induction	Janet Allison and Tony McLaughlin (after registration, 14 Sept)
1	WebCT Induction	Janet Allison
1	Basic Induction	1 st year: What is a University? (Michaela Black) 2 nd year (placement focus): Dave Bustard and Norman Creaney 4 th year (project and career focus) Dave Bustard, Ray Hickey & Anne Rowe, Mon, 20 Sept (3.15, LT8)
2	Coursework, Plagiarism & Referencing	Small Group Tutorials, Wed 29 Sept (Ray Hickey) D063
3	Meet your Advisor (in groups, then individually as necessary)	Meetings to (i) confirm details in student files; (ii) explain EC1 forms; (iii) discuss attendance so far.
4	How to Study: organisation and basic time management	Small Group Tutorials, Wed 13 Oct (Dave Bustard) D063
5	PDP	Overview, and ongoing in later weeks, Organiser: Michaela Black (lab based)
6	<i>Consolidation week</i>	Events as required
7	<i>Coursework week</i>	
8	Preparing for Examinations	Small Group Tutorials, Wed 10 Nov (Dave Bustard) D063
9	<i>Coursework week</i>	
10	<i>Coursework week</i>	
11	Meet your Advisor (in groups, then individually as necessary)	Reflection on first semester and CV preparation through PDS
12	Revision week	Events as required
	2nd semester Q&A Session with year ahead	Organiser: Michaela Black

Additional tutorials for first year students will be provided through module COM135:

- Science Shop Introduction
- Programming skills for PDP
- Library Induction Online
- Student Support Interactive session
- Group Work

Organiser: Michaela Black

2.2 Advisor of Studies

On enrolment to the course the Course Director will allocate all students an Advisor of Studies. The Advisor of Studies will agree with their students the frequency and format of meetings which will normally take place at least once during each semester. Advisors of Studies have a responsibility to guide their students in matters affecting their choice of optional modules, curriculum content, assessment, progress, and study and examination skills. Advisors of Studies are responsible for reporting on their students' progress in accordance with the procedures approved by the Course/Subject Committee and Faculty Board. Advisors of Studies are also encouraged to act in a general advisory capacity and to assist their students, particularly those in their first year, in meeting the requirements of a University environment. Where necessary, they should seek, or advise their students to seek, guidance and assistance from the range of support provided by Student Support, the Students' Union, Information Services, Chaplaincy etc.

2.3 Student Engagement

In Year 1 (Level 4) students are divided into teams and these teams are asked to engage in challenging competitive tasks for points in a fun, non-threatening environment. The teams select their own name or moniker for identification purposes and they are awarded points on the basis of a range of activities such as attendance, asking relevant questions in class, having work submitted on-time, and general performance and engagement (individual or group). The points accumulated determine the team's position in a league table and the league table is updated and displayed weekly. There are also additional award categories for performance e.g. most improved team, largest individual member contribution etc.



Photographs: Engagement Games Prize Winners

2.4 University Centralised Support

The University's centralised *Department of Student Support* is available to help students achieve the maximum benefit from their University life. Students encounter personal challenges in learning and in living within the university environment. The purpose of the Department of Student Support is to assist students, not only in relation to academic achievement, but also in their social and personal development, and to help them plan their future careers. There are a number of key areas of to students and including Accommodation Services, Health Services, Nursery Care, Students Union and Student Development (which includes Counselling & Guidance and Careers). Details are available at: <http://www.studentsupport.ulster.ac.uk/>

2.5 Learning Resource Centre

Student learning facilities are also provided for via a modern £3.5 million [Learning Resource Centre](#) (LRC) which opened in 2008. Situated at the heart of the campus the LRC offers study and learning facilities via 230 networked computers and a further 450 personal study spaces. Mirroring the rest of the campus the LRC is fully Wi-Fi enabled for laptop users. Computer access, printing and photocopying facilities are available at the open access IT suite 24 hours a day.

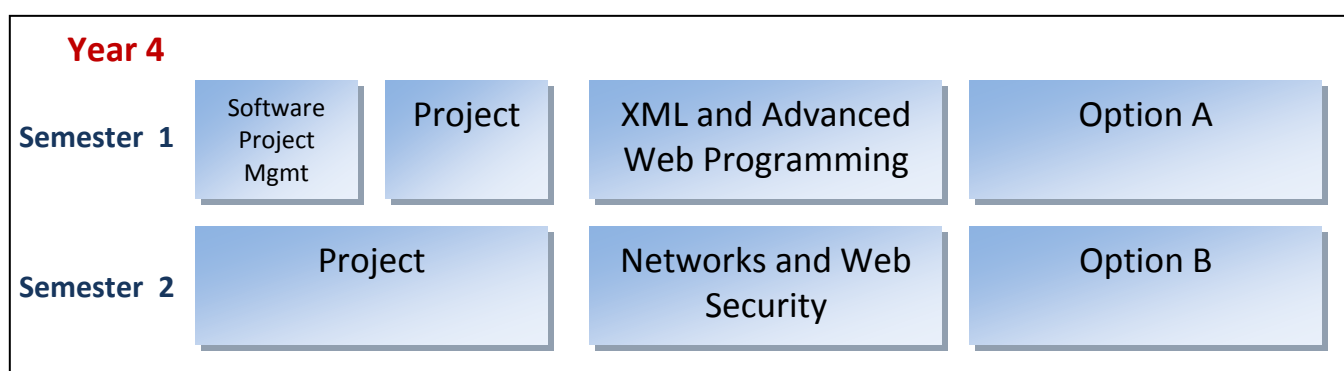
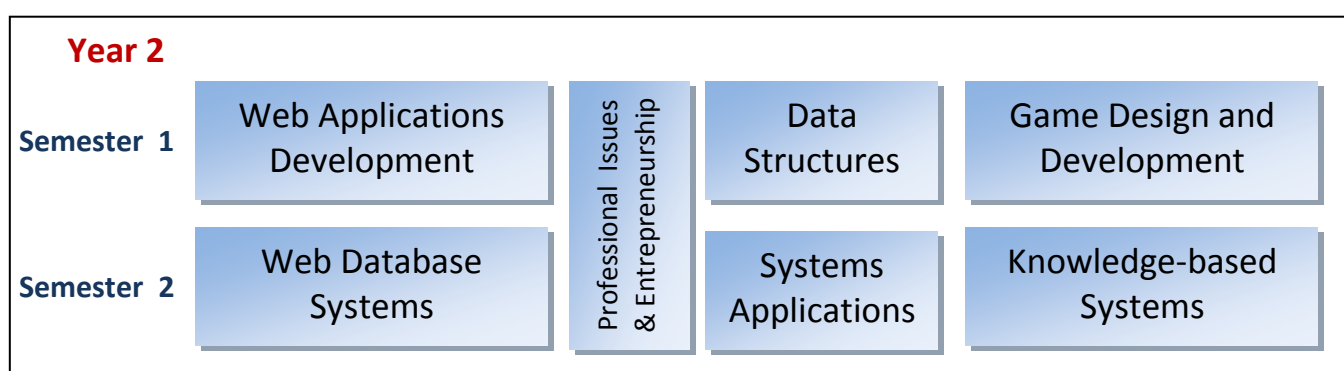
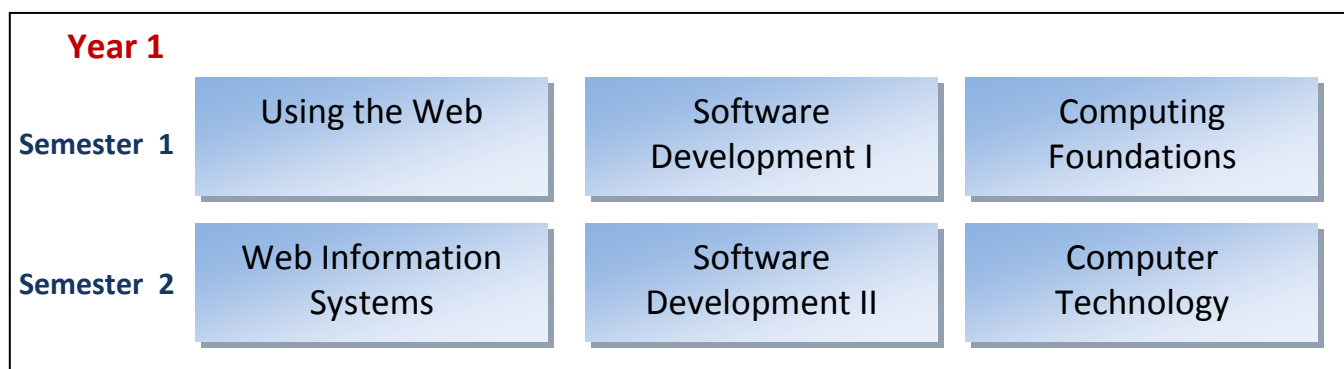
2.6 Software Resources

The School maintains a web page providing links to a number of free-to-download software packages that will help you re-create the lab environment on your own PC. A selection of the software available is presented in the table below.

Java	Applications	Internet	Antivirus	Utilities
-Eclipse -JDK	-LPA Win-Prolog -Clementine/PASW -Notepad++ -Rational Rose -db4objects - Excel Add-ins ORMM	-Firefox -Adobe SVG Viewer -mifiles -DevPHP -SSH Secure Shell 3.2.9.2	-Stinger	-IZARC -TreeSize Free

Links to the software packages can be found on the School website at <http://www.compeng.ulster.ac.uk/cie/softwareforstudents>

3. COURSE STRUCTURE



Note: The Year 4 Option Modules are driven by the needs of the industry coupled with relevant staff research interests. At present the Option Modules are as follows:

Operational Research
Image Processing
Console Game Development
Intelligent Systems

Machine Learning & Data Mining
Digital Advanced Database
3D Game Technologies
Mobile and Networked Games

3.1 Module Summaries - Year 1

This year forms a common core which is designed to provide students with a firm foundation of theory and practice across the broad spectrum of computing. Students will be provided with a sufficient level of proficiency in computing so that they can make a positive contribution to the work of their placement year. They will also gain an understanding of the underlying theory of computing and its applications so that they can extract maximum benefit from their placement year:

Computing Foundations

This module provides the student with the computing foundations to enhance an understanding of the material presented in various computing modules on the course. The student will develop proficiency in the use of the necessary fundamental mathematical concepts in the areas of discrete structures, number systems and Boolean algebra. The analytic skills and conceptual thinking required for competence in areas such as programming, database analysis, and systems design are developed in this module. In addition, hardware fundamentals are addressed through the design of digital logic circuits. These skills are developed through examples and practical applications.

Computer Technology

This module introduces students to the basic hardware components from which a computer system is constructed and the organisation of these components. The components of the computer system that are involved in the execution of a software program will be discussed. Students will also gain an understanding of how computers communicate, both in general, and when used in local and wide area networks.

Software Development I

Students are introduced to key object-oriented (OO) and software development concepts to reinforce the idea that they must become an object user before they can design their own. Objects and their representation are discussed, concentrating on primitive data types and OO terms and techniques. This will be reinforced by practical use of existing pre-defined classes like JFrame, introducing the students to interactive interfaces. Software engineering principles and techniques will be interwoven with the topics and assessment exercises. The module extends interface applications within the area of Swing and all of the available predefined GUI components and mechanisms.

Using The Web

This module introduces internet connectivity and applications. The focus is on the use of the Web by home and office users. The practical side of the module introduces the construction of Web sites using HTML and CSS.

Web Information Systems

This module examines the foundations for large, typically commercial, Web applications. The focus is on the provision of Web services by an organisation. The concept of an "information system" is presented and the various roles, responsibilities and communications within the system are examined. Usability and accessibility is recognised as a vital component of commercial Web applications, and ISO & W3 guidelines for effective interface design are presented.

Software Development II

This module introduces selection and repetition mechanisms in Java. This enables the introduction of arrays as an extended intermediate storage structures and files as a permanent storage mechanism. The module extends their use of OO techniques and Java constructs into the hierarchy of super and sub classes and the area of inheritance. The module extends the area of interface applications within Swing introducing pre-defined GUI

components and mechanisms available to them. All of these theories will be supported by gaining weekly practical experience in the labs.

3.2 Module Summaries – Year 2

Year 2 builds on the basic and generic skills acquired in Year 1. Modules are designed to provide students with an introduction to advanced topics in computing thereby helping them to make an informed choice of specialist options in their final year.

Knowledge Based Systems

This module introduces core material for the artificial intelligence pathway of the undergraduate computing degree while also reinforcing communication and problem solving skills developed in other modules. It provides an introduction to artificial intelligence techniques used in the development of knowledge based systems. Specific topics covered include Prolog programming, knowledge representation and automated reasoning, expert systems, and knowledge engineering.

Game Design and Development

This module is designed with important core material for subsequent games modules of an undergraduate computing degree and also contains games specific content that reinforces mainstream computing knowledge and skills. Students will have an opportunity to learn about the origins and current nature of the games industry and learn fundamental design and software engineering techniques that will underpin any further study in this area.

Web Applications Development

The design and maintenance of Web sites has become one of the major growth areas in Computing in recent years, with most organizations now boasting at least some presence on the Web. This module provides a practical introduction to the tools and techniques required to construct and manage Web-based applications, for both internet and intranet.

Professional Issues & Entrepreneurship

Students on a vocational programme ought to have an understanding of the industry for which they are being prepared. They also need to be aware of their own potential, and be able present themselves appropriately to a prospective employer. Skilled graduates will benefit from an enterprising attitude and an ability to identify and exploit innovations and opportunities. Professionals need to be aware of the full range of responsibilities that their status places upon them, and of the sources of support that are available to them in meeting these responsibilities. This module aims to address these needs in the context of the computing industry.

Systems Applications

This module gives students a detailed introduction to the functions and design options of modern operating systems and systems software. Particular emphasis is given to the issue of concurrency, and to the design and implementation of language processing software. Students will have the opportunity to develop and consolidate their software development skills, and to gain experience of using a Unix like operating system.

Data Structures

This module is designed to improve a student's programming skills. It introduces many of the most important techniques including the implementation and use of the common abstract data types. It includes an introduction to the C++ programming language.

Web Database Systems

This module recognises the need for flexible and efficient storage of information in Web applications. The underlying principles of database organisation are presented, and practical implementation in a Web environment provides a basis for the construction of large-scale online applications. Context is provided by a study of the requirements of e-business applications and identification of the opportunities for enhanced customer service by considering the data generated during the lifetime of the application.

3.3 Year 3 - Placement

Year 3 will consist of a one year Professional Placement in a commercial or industrial environment. Students are placed in employment through the standard procedures of application and interview but all arrangements leading to interview and a contract of employment are undertaken by a member of academic staff, the Placement Co-ordinator.

Performance on the placement will be assessed and students attaining a sufficient level of performance will be eligible to have their degree supplemented by the award of the Diploma in Industrial Studies (DIS). Students are placed in employment through the standard procedures of application and interview. Arrangements leading up to an interview and a contract of employment are monitored by the Placement Tutor. The Placement Tutor is a member of the Computing Placement Coordination Team chaired by the Director of Work Based Learning for the Faculty. This group seeks to ensure close collaboration in the work of individual course placement tutors

Preparation for Placement

In addition to exploring the various aspects of the placement year and its relationship with other elements of the BSc programme, students are prepared for the application and selection procedures associated with placement and ultimately, employment. This includes advice on researching the market, completion of application forms, and preparation for interview. Much of this preparation takes place in the Professional Issues module in Year 2. However, all Year 1 and 2 modules contribute to the desired portfolio of skills and in particular, the teamwork aspects will help to develop important inter-personal and group skills that are of increasing importance within the commercial environment.

There is a wide range of placement opportunities in Northern Ireland, Great Britain and the Republic of Ireland, and from time to time some placements overseas. We will find several employers willing to consider you for placement. Selection is by competitive interview by the employer concerned. They will pay your interview expenses. There is no maintenance grant or loan during the placement year; instead you will receive a proper salary. The placement lasts for about 48 weeks. Students have reported in glowing terms on the value of the placement experience, and their placement employers have offered several eventual permanent positions. Similarly placement employers have reported very favourably on our students.

For the student, placement should ideally provide appropriate training and work based in a well organised design team. It must provide a genuine opportunity for the student to develop towards professional competence. The Faculty has built up contacts with many employing organisations that are in a position to provide suitable placements. While the precise nature of placements will vary from employer to employer, it is intended that students are initially given close supervision and guidance and are progressively given more responsibility as the placement proceeds. Before the end of placement students should be contributing as a full employee of the company. During placement each student is supervised by an industrial supervisor from the employing company and an academic supervisor from the Faculty.

Normally, each student will receive at least two visits from an academic supervisor. However, special arrangements such as telephone, e-mail or video conferencing may be used to contact those students who are placed in geographically distant locations. These media may also be used to supplement the formal academic visits to other students if necessary.

The experience gained and the associated personal development are subsequently drawn on during the final year of the BSc Programme. In some cases the final year project may stem directly from projects that have been identified during the placement year. Successful completion of the industrial placement is recognised by the award of the Diploma in Industrial Studies.

Placements also help to provide graduates with the qualities that employers require. The visits of academic supervisors to students on placement provide an ideal opportunity to obtain a view of the programme from an industrial perspective. The links with industry, which placement promotes, also help the Course Committee to keep abreast of changing industrial requirements and often lead to other joint ventures such as custom-built training programmes, teaching company schemes and other collaborative research.

Placement offers an opportunity to use and enhance the skills developed during the first two years of the Programme in a work-based context. Each student's placement experience will be different depending on the employer but each placement is vetted by the University to ensure it offers a worthwhile experience. Within the Faculty, there have been many instances of students taking up a full-time post with their placement employer after graduation.

In addition to developing multimedia skills, placement often provides opportunities for students to acquire other transferable skills such as working as part of a team, interacting with clients, business awareness etc.

Key skills are qualities of graduates that are greatly desired by today's employers. They include the ability to work as part of a team, write written reports or give oral presentations. Opportunities are provided throughout the programme to develop these important qualities, in particular through group assignment work included in several modules and the opportunities offered through placement. Often assignments will include marking criteria that assess a student's ability in one or more key skills, for example, by awarding a mark for the effectiveness of a group as part of a group project.

The Placement Tutor

The BSc Programme has a member of academic staff known as the Placement Tutor who is responsible for:

- ✓ Establishing and maintaining good relations with placement providers;
- ✓ Finding new placements as required;
- ✓ Preparing students for the placement experience;
- ✓ Administering the process whereby students are placed;
- ✓ Collating the assessment returns at the end of the placement year;
- ✓ Making recommendation regarding each student's overall performance and progress.
- ✓ The Programme Placement Tutor is a member of the Faculty of Computing and Engineering Placement Group chaired by a Faculty Placement Co-ordinator. This group seeks to ensure close collaboration in the work of various Programme placement tutors.

3.4 Module Summaries - Year 4

Year 4 capitalises on the maturity and professional experience of the students gained during the Professional Placement. Student choice is offered through a range of taught modules. A major computing project is undertaken. Each student will also be assigned a project supervisor, who will guide them through the implementation of the chosen project.

Software Project Management

This module is concerned with the goals, activities, techniques and tools associated with the management of software projects to meet client requirements, within defined cost and time constraints. The syllabus material is covered through a mixture of lectures, seminars and tutorials, reinforced through an individual exercise.

Project

In this module, students, under the supervision of a member of staff, undertake an individual computing project using appropriate computer science and/or software engineering techniques. The project will build on knowledge and skills acquired previously on the course and will provide opportunity for the attainment of new knowledge and skills. The final deliverable is in the form of a written report, and the student will also be expected to give an oral presentation about their project and a demonstration of the implemented solution.

Multimedia

Recent advances in desktop computing systems, coupled with increased network bandwidth, have prompted the emergence of multimedia technology as a core area in Computing. This module deals with the capture, generation, storage, manipulation and presentation of all types of digital media.

Console Game Development

This module aims to provide students with an opportunity to learn about and programme games for state-of-the-art commercial game console hardware. Both practice and background theory is covered. Additionally each year a specialist game programming topic is covered in the context of real world development software, for example artificial intelligence, networking, or game engine design.

3D Game Technologies

This module examines algorithms and architectures for interactive 3D games. Much of the emphasis is placed on the challenge of achieving real-time frame rates for complex, interactive scenes - close analysis of the problem domain will be encouraged, and this will lead to the acquisition of skills transferable to other areas of computing. Acceleration techniques such as efficient scene management and level-of-detail (LOD) rendering are investigated, as is physics for games. Advanced modelling and rendering is also addressed (e.g., hair, cloth, particle effects).

Mobile and Networked Games

Many games are played in a networked environment involving 2 or more players (e.g., LAN games, online games) or on mobile devices such as mobile phones. This module examines the constraints that these contexts place on the design of games, explores relevant technologies and provides an opportunity for students to develop a portfolio of small games suitable for deployment on mobile and networked platforms.

Digital Image Processing

This module provides a foundation in the concepts and techniques used in Image Processing and Computer Vision systems. Digital Image Processing is a rapidly expanding field and as such has applications in areas such as medicine, biomedical sciences, factory automation and manufacturing. The module provides students with the opportunity of studying a subject area which is at the forefront of exploiting state-of-the-art advances in technology.

Machine Learning and Data Mining

Machine Learning - endowing systems with the ability to learn how to undertake a task as distinct from their being programmed to do it - is now a major research activity in Artificial Intelligence. The intelligent systems of the future - from office software, networks and the web, to cars and household appliances - will need this learning ability to truly understand and support their users. In this module the notion of Machine Learning is introduced. Techniques from two major paradigms (symbolic and neural) are studied. Several application areas of Machine Learning are explored in particular Data Mining. Deployment of Machine learning systems on the Web is discussed. Students will experiment using a Data Mining package.

Advanced Database

There are a number of important emerging application areas for which relational database systems are not well suited. These applications deal with data that can be nested, compound or multimedia in format and may also involve temporal data and long-duration transactions. A new generation of database paradigms has been developed to deal with these challenges. The module provides students with a thorough understanding of the theory and practice of advanced database systems.

Computer Networks

This module will provide all students with a detailed knowledge of the core concepts in advanced computer network technology. Issues such as communication, wired and wireless networks, standards, protocols and network security will be examined and the students will be given an understanding issues associated with efficient transmission in both wired and wireless environments.

Network and Web Security

Digital security is now one of the main threats to businesses worldwide. This module examines the problems faced by network administrators in combating the growing threat to network security posed by hazards such as viruses, worms and hackers; and presents a range of preventative measures.

Intelligent Systems

This module examines the role of artificial intelligence techniques in intelligent systems applications ranging from customer help-desk support to medical and legal decision making. Emphasis is placed on mixed-initiative problem solving and the role of explanation as a means of building user trust and confidence in intelligent systems. Students will also develop practical skills in the application of artificial intelligence techniques such as search, planning, and case-based reasoning in a variety of problem-solving contexts.

XML and Advanced Web Programming

In recent years, XML and associated technologies have played an increasingly central role in leading-edge Web development. This module introduces XML as the basis for advanced development techniques using AJAX and Web services. In addition, an introduction to agile Web development is presented, with implementation using Ruby On Rails.

Operational Research Methods

The module describes the theory and practice of Operational Research. It covers deterministic methods such as Linear, and Integer Programming and probabilistic methods such as Markov Chains, Queueing Theory and Simulation. The use of Modelling to analyse and evaluate Computer Systems is emphasised. Some heuristic methods which have been developed by the Artificial Intelligence community are also discussed.

3.5 Career Opportunities

All graduates from this Programme will have a high degree of skill in the development of quality software. The “core” of the Programme, essentially the first two years of study plus the final year project, will have prepared them for careers in software production in a variety of positions, including software houses, data processing and industrial computing. The Programme will also have prepared them to work at the hardware/software interface, and will provide the potential for hardware design.. Further study routes are also possible through MRes, MPhil and PhD Programmes for those wishing to conduct detailed research into specific aspects of Information Technology. Careers advice is formally provided by the Careers Service. See <http://www.ulst.ac.uk/careers/> for more information.

3.6 Teaching, Learning and Assessment Strategies

Teaching on all years of this degree takes the form of a suitable mix of lectures, laboratory sessions and/or tutorials in accordance with the approved module specifications.

The School of Computing & Information Engineering has fully embraced the concept of e-Learning and has considerable experience in its use. At module level, there is 100% engagement within the School with the University’s MLE (WebCT Vista) and all of the School’s modules are described as being (at least) “web-dependent”.

The Course Committee meets in advance of each semester and makes arrangements for an agreed schedule of assessments for the semester. In agreeing and approving the schedule the committee ensures that the students’ workload is distributed fairly evenly across each semester.

Where students are assessed by group work, they will be made aware at the outset of the module how individual contribution to group work will be assessed and marked. While precise details will vary from assessment to assessment, typically group work assessments include both a group mark and an individual component mark.

Assessment on this degree takes the form of a suitable mix of activities including group work, presentations, programming exercises, log books, individual lab exercises and sessional examinations. As with the delivery of modules, the assessment is appropriate to the learning outcomes of the module.

All student work is moderated in compliance with the Faculty’s Code of Practice. This includes matters relating to the moderation of both coursework and examinations at each level (including External Examiner involvement in the process).

The final year project will (as appropriate) be supervised by one or more academic members of the Course Committee. The final year project is double marked

3.7 Personal Development Planning

Personal Development Planning (PDP) is a structured process to support students to become more effective, independent and autonomous learners, and to plan for career development. Employers are increasingly expecting graduate recruits not only to have a good degree but also a well-rounded CV. The use of PDP is perceived by employers as evidence of someone who is both capable and competent at their work and also able to keep abreast of new trends and developments.

The Personal Development System (PDSsystem) is a web application accessible from any computer, on campus or at home. It supports students' Personal Development Planning, enabling them to reflect upon, record and evaluate their personal, academic and career experiences.

PDP is introduced as part of the student's Induction programme. Studies Advisors will encourage and support the students in their use of PDSsystem to access personal and key module skills; personal adaptation to university study and life; identify and address weak areas. The two Year 1 modules - Software Development 1 & 2 – will provide students with an opportunity to reflect on their key skills and to make plans to overcome any deficiencies. Students will be able to implement and reflect and analyse the success of their chosen technique.

The groundwork established in Year 1 is then built on in Year 2 in Placement preparation sessions where practical application of the principles comes into play. Again, the PDSsystem is utilised to assist with the production of CVs etc., enabled by direct integration with the Faculty's online placement support system, OPUS. Students also use the PDSsystem's journaling feature to reflect on work-based problems and to make their responses available for review.

In final year, students are strongly encouraged to avail of the services of the Career Development Centre for further development of interview skills, job selection and career planning. PDP is given appropriate prominence at all stages of the degree.

As part of a student's on-going personal development a variety of extra-curriculum opportunities will become available to them while studying on the course. All students are strongly encourage to participate in as many of these as possible. Typical examples of these development opportunities are:

- Microsoft Imagine Cup: <http://www.microsoft.com/ireland/imaginecup/>
- Class Representatives:
http://www.uusu.org/content/52625/class_representation_/
- Tutoring in Schools: <http://www.ulster.ac.uk/teachlearn/access/tis/>
- Student Union Membership & University Clubs: <http://www.uusu.org/>
- Entrepreneurial Competitions
- Member of School Social Events Organisational Team
- Team Roles in Groups
- Invited Guest Speakers Talks

3.8 Prizes and Awards

The University offers annually a number of prizes and awards for competition among students. These are awarded by the Board Of Examiners to the most successful students on their programmes. On this Programme, the following prizes are offered.

Title of Prize	Criteria for selection	Students eligible
McCrea Leebody Science Awards (normally no more than 3 awards each year)	Performance in year 1 studies	All year 1 students across all campuses
Alumni Fund Awards for Academic Excellence	Highest overall average mark across the modules undertaken for year 1 or equivalent	All university-based undergraduate degree students in the Faculty who have completed year 1
British Computer Society Medal and Prize	Most outstanding student in the final Honours year	All final Honours year students across all campuses
Kainos Prize	Final year project which uses technology in the most innovative way	Final year students on the Coleraine campus

3.9 The Programme Timetable

The Programme timetable will be distributed at enrolment or induction and can also be viewed on the Programme Noticeboard.

3.10 University Calendar 2010-2011

Semester 1 (Autumn)	Monday 20 September 2010	Teaching begins
	Friday 10 December 2010	Teaching ends
	Monday 13 December 2010	Christmas Vacation begins
	Friday 24 December 2010 to Monday 3 January 2011	University Closed (Christmas)
	Tuesday 4 January 2011	Christmas Vacation ends
	Wednesday 5 January to Saturday 15 January 2011	Examination Period
	Friday 21 January 2011	Autumn Semester ends
Semester 2 (Spring)	Monday 24 January 2011	Teaching begins
	Wednesday 17 March 2011	University Closed (St Patrick's Day)
	Monday 18 April 2011	Easter Vacation begins
	Monday 25 April to Friday 29 April 2011	University closed
	Friday 29 April 2011	Easter Vacation ends
	Monday 2 May 2011	University Closed (May Day)
	Monday 9 to Saturday 21 May 2011 (with possible extension to 24 May if required for first sit examinations)	Examination period
Friday 27 May 2011	Spring semester ends	
Resit Period	Wednesday 17 August to Thursday 25 August 2011	Supplementary Examinations

4. PROGRAMME MANAGEMENT

4.1 Course Director – Dr Adrian Moore

Day-to-day administration of each Programme is the responsibility of the Course Director. All major decisions in the running of the Programme are taken at Course Committee meetings.

4.2 Year Coordinators

Year Coordinators are responsible for the pastoral care of their assigned year and the overseeing of major activities in that year. Common responsibilities will include monitoring attendance, identifying class representatives, and addressing issues that arise, either through student-staff meetings or in day-to-day operations.

Year 1: Dr Michaela Black

Year 2: Dr Norman Creaney

Year 3: Dr Karl Stringer

Year 4: Mr Ray Hickey

4.3 Course Committee

The Course Committee is essentially a committee formed by those members of academic staff who have teaching responsibilities on the Programme as well as the nominated Studies Advisors.

The Course Committee reports to the Faculty's Learning and Teaching Committee, which in turn reports to the Faculty Board. This is the normal route for all of the Faculty's Course Committee meeting minutes.

Student progression (i.e. assessing the performances of students and determining whether or not they should be allowed to proceed to the next stage of the Programme) is the responsibility of the Board of Examiners. The Board of Examiners is essentially the Course Committee plus an External Examiner. The External Examiner is an academic member of staff from another university whose main brief is to oversee standards etc. on the Programme.

The Programme Committee meets on a regular basis - normally at least once per semester, although other special meetings may be arranged should a need be identified.

4.4 Student/Staff Consultative Committee

Part of the Course Committee meetings is devoted exclusively to the consideration of general student problems associated with the Programme. This is the Staff-Student Consultative Committee and two/three elected students from each year of the Programme are invited to participate as Class Representatives. These elected representatives are invited to express the views of their peers in relation to the organisation and delivery of the Programme. In the past, issues addressed have included:

- ✓ Resourcing;
- ✓ Comments on the delivery & assessment of each module;
- ✓ Workloads;
- ✓ General Feedback
- ✓ Other general programme-related matters

The Student/Staff Consultative Committee is a formal forum for students to express their opinions. The Faculty's policy is to encourage the early identification of problems and to bring these to the attention of staff as soon as possible.

5. PROGRAMME SPECIFICATION

COURSE TITLE: *BSc Hons Computing (Internet Systems) DIS/DAS*

PLEASE NOTE:

This specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he or she takes full advantage of the learning opportunities provided. More detailed information on the specific learning outcomes, content and the teaching, learning and assessment methods of each module can be found on the School website at http://www.compeng.ulster.ac.uk/cie/cie_undergraduate.php.

1	AWARD INSTITUTION/BODY:	UNIVERSITY OF ULSTER
2	TEACHING INSTITUTION:	UNIVERSITY OF ULSTER
3	LOCATION:	COLERAINE
4	ACCREDITED BY:	British Computer Society
5	FINAL AWARD:	Bachelor of Science (BSc)
6	MODE OF ATTENDANCE:	FULL-TIME
7	SPECIALISMS:	Computing Science
8	COURSE/UCAS CODE:	6076 G420 C BSc/CompIS
9	DATE WRITTEN/REVISED:	May 2008

10 EDUCATIONAL AIMS OF THE COURSE

The overall aim of the programme is to provide a broad education in computing to a level that prepares students for either immediate employment in the computing industry or entry to a postgraduate course in Computing on the Coleraine campus, within UU or beyond.

In particular, it seeks to:

- provide a rigorous study of the theory and principles underlying modern computing applications
- develop a high degree of expertise in the application, integration and critical evaluation of a range of computing tools and facilities
- develop an ability to use, compare and critically evaluate a range of techniques, theories and methods as used in the development of computing applications
- instil an understanding of the individual, social, organisational and economic implications of the application of computing
- develop an ability to carry out a programme of work with minimal supervision
- develop an ability to communicate effectively
- promote the knowledge and skills required by the computing industry

- stimulate an interest in computing as an academic discipline, with a view to encouraging progression to postgraduate research
- provide appropriate experience of working in the computing industry through a work placement
- provide students with an opportunity to obtain an in-depth knowledge and understanding of selected areas of interest

11 MAIN LEARNING OUTCOMES

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
- current research or other advanced scholarship carried out by academic staff
- subject benchmark statement (Computing – March 2007) available at: <http://www.qaa.ac.uk/academicinfrastructure/benchmark/statements/computing07.pdf>
- requirements of professional (BCS) bodies
- national and University qualifications and credit frameworks

The course provides opportunities for students to achieve and demonstrate the following learning. Successful students will be able to:

11 K KNOWLEDGE AND UNDERSTANDING OF SUBJECT

- K1** demonstrate knowledge and understanding of the key concepts, principles, theories and practices that underpin computing as an academic discipline and its relevance to everyday life
- K2** demonstrate knowledge and understanding of a range of tools, practices and methodologies used in the specification, design, implementation and critical evaluation of computer software systems
- K3** demonstrate knowledge and understanding of the 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
- K4** demonstrate knowledge and understanding of the principals of generating tests which investigate the functionality of computer systems and evaluating their results
- K5** demonstrate knowledge and understanding of the underlying technologies that support electronic processing and inter-computer communication
- K6** demonstrate knowledge and understanding of professional, economic, social, environmental, moral and ethical issues involved in the sustainable exploitation of computer technology
- K7** demonstrate knowledge and understanding of developments in research fields across a range of knowledge areas

Teaching and Learning Methods:

Teaching and learning will be a mixture of lectures, seminars and laboratory classes (practical classes). Much of the teaching materials will be provided in electronic form, with WebCT providing a managed learning environment for the course. The student will develop from being heavily guided towards the relevant material to become more independent as they progress towards self-learning across the programme. All modules are (at least) Web Dependent. Electronic assessment will be used where practical and appropriate.

Assessment Methods:

Assessment will take the form of a mixture of closed-book examinations, submission of laboratory books, coursework assignments, class tests and oral presentations.

11 I INTELLECTUAL QUALITIES

- I1** apply the key concepts, principles, theories and practices underpinning computing as an academic discipline and its relevance to everyday life
- I2** analyse problems, identify requirements and propose and critically evaluate alternative solutions for computer software systems
- I3** develop criteria to measure the appropriateness of a computer system for its current deployment and future evolution, and to evaluate and interpret the results obtained
- I4** develop criteria for the critical evaluation of the functionality of computer based systems taking into account factors such as limitations, constraints, fitness-for-purpose, quality and possible trade-offs
- I5** critically assess the underlying technologies that support electronic processing and inter-computer communication
- I6** recognise the relevance of professional, legal, moral, social and ethical issues in their work
- I7** read and evaluate research papers in a range of knowledge areas
- I8** synthesise ideas, proposals and designs using models and rational and reasoned arguments, for presentation to a range of audiences

Teaching and Learning Methods:

Teaching and learning will be a mixture of lectures, seminars and laboratory classes (practical classes). Much of the teaching materials will be provided in electronic form, with WebCT Vista providing a managed learning environment for the course. Electronic assessment will be used where practical and appropriate.

Assessment Methods:

Assessment will take the form of a mixture of closed-book examinations, laboratory books, coursework assignments, class tests and oral presentations.

11 P PROFESSIONAL/PRACTICAL SKILLS

- P1** select and use relevant sources of information to identify potential computing resources for a specific purpose
- P2** select and effectively deploy a range of tools for the modelling, construction and documentation of computer applications
- P3** specify, design and construct computer-based systems for a range of application areas
- P4** test and evaluate systems in terms of general quality attributes recognising potential trade-offs within the given problem
- P5** operate computing equipment effectively and safely recognising its logical and physical properties within a specific context
- P6** be guided in their work and decision making by professional, legal, moral, social and ethical practices
- P7** select and use an appropriate mix of tools and aids in preparing and presenting reports and other material for a range of technical and non-technical audiences, such as management, computer users, and the academic community

Teaching and Learning Methods:

Practical skills will be developed and nurtured primarily in the supervised laboratory classes. Typically the emphasis will move from quite heavily guided laboratory work towards work that requires a greater individual contribution. Professionalism and professional practices will be encouraged at all stages with a year two module identified as a key element in ensuring students are formally aware of the issues prior to Placement. Much of the resources will be provided in electronic form with WebCT Vista providing a managed learning environment for the course.

Assessment Methods:

Problem based coursework, use of laboratory resources, lab books, presentations, individual reports and contribution to group reports. Electronic assessment will be used where practical and appropriate.

11 T TRANSFERABLE SKILLS

- T1** demonstrate effective information-retrieval skills
- T2** demonstrate appropriate numeracy and literacy skills in understanding and presenting cases involving a quantitative and qualitative dimension
- T3** make effective use of general IT facilities
- T4** work as a member of a team recognising the various roles within a team and alternative ways of organising a team
- T5** organise and manage their own learning and development in an efficient and effective manner
- T6** make use of a range of learning resources to guide their learning
- T7** appreciate the need for continuing professional development in recognition of the need for lifelong learning
- T8** communicate effectively using various media and for a variety of audiences

Teaching and Learning Methods:

These skills will be progressively developed across the course primarily through the tutorials, seminars, practical sessions associated with each module. These will be supported by the activities associated with the Placement (including Placement preparation) and project work (including Project preparation and implementation).

Assessment Methods:

Reports, lab based assessment, use of software packages, groupwork, group projects, CV preparation, examination and coursework. Electronic assessment will be used where practical and appropriate.

11 PROGRAMME LEARNING OUTCOME MAP

Please Note: The matrix displays only the measurable programme outcomes and where these are developed and assessed within the modules offered in the programme.

YEAR 1

MODULE		OUTCOMES																													
TITLE	CODE	K 1	K 2	K 3	K 4	K 5	K 6	K 7	I1	I2	I3	I4	I5	I6	I7	I8	P 1	P 2	P 3	P 4	P 5	P 6	P 7	T 1	T 2	T 3	T 4	T 5	T 6	T 7	T 8
Computing Foundations	COM165	✓	✓	✓					✓	✓							✓	✓						✓	✓	✓					
Using the Web	COM103	✓				✓			✓				✓				✓						✓	✓		✓	✓	✓			✓
Software Development I	COM135		✓	✓	✓					✓	✓							✓	✓	✓						✓	✓			✓	
Computer Technology	COM166	✓				✓							✓				✓				✓										
Web Information Systems	COM104		✓		✓		✓			✓		✓		✓					✓	✓		✓				✓	✓	✓			✓
Software Development II	COM138		✓	✓	✓					✓	✓							✓	✓	✓						✓	✓			✓	

YEAR 2

MODULE		OUTCOMES																													
TITLE	CODE	K 1	K 2	K 3	K 4	K 5	K 6	K 7	I1	I2	I3	I4	I5	I6	I7	I8	P 1	P 2	P 3	P 4	P 5	P 6	P 7	T 1	T 2	T 3	T 4	T 5	T 6	T 7	T 8
Professional Issues & Enterprise	COM411						✓							✓								✓	✓	✓				✓		✓	
Advanced Software Development	COM316	✓	✓		✓				✓	✓		✓						✓							✓	✓					
Web Applications Development	COM438		✓			✓	✓			✓			✓	✓					✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	
Game Design & Development	COM436	✓	✓						✓	✓							✓	✓	✓					✓		✓	✓				
Web Database Systems	COM302	✓				✓	✓		✓	✓				✓				✓	✓			✓		✓	✓	✓	✓	✓	✓		✓
Systems Applications	COM356	✓	✓			✓			✓	✓	✓						✓				✓			✓		✓		✓			
Knowledge Based Systems	COM340	✓		✓					✓		✓						✓			✓				✓				✓			

Final Year

MODULE		OUTCOMES																													
TITLE	CODE	K 1	K 2	K 3	K 4	K 5	K 6	K 7	I1	I2	I3	I4	I5	I6	I7	I8	P 1	P 2	P 3	P 4	P 5	P 6	P 7	T 1	T 2	T 3	T 4	T 5	T 6	T 7	T 8
Software Project Management	TBA		✓				✓	✓		✓				✓			✓	✓				✓	✓		✓	✓		✓		✓	✓
Project	COM570	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Multimedia	TBA	✓	✓						✓		✓						✓	✓						✓	✓			✓	✓		✓
O.R. Methods	COM551	✓	✓		✓			✓	✓	✓	✓	✓			✓		✓	✓		✓			✓	✓	✓	✓		✓	✓		✓
Machine Learning & Data Mining	COM542	✓	✓	✓	✓			✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓		✓
Console Game Development	COM569	✓	✓						✓	✓							✓	✓	✓					✓		✓	✓				
3D Game Technologies	COM523	✓	✓	✓				✓	✓	✓					✓		✓	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓
Mobile & Networked Games	TBA	✓	✓	✓				✓	✓	✓	✓	✓			✓		✓	✓	✓					✓	✓	✓		✓	✓	✓	✓
Digital Image Processing	COM536	✓				✓		✓	✓					✓					✓		✓		✓		✓	✓					
Computer Networks	COM548	✓	✓	✓		✓	✓	✓	✓		✓		✓		✓	✓	✓	✓				✓	✓	✓	✓	✓	✓		✓	✓	
Networks & Web Security	TBA		✓			✓				✓				✓			✓	✓						✓	✓			✓	✓		
Advanced Database	COM572	✓	✓					✓	✓	✓					✓			✓										✓			
Intelligent Systems	COM524	✓		✓					✓			✓					✓			✓				✓				✓			
XML & Advanced Web Programming	TBA		✓			✓									✓			✓	✓					✓	✓			✓			

12 STRUCTURE AND REQUIREMENTS FOR THE AWARD

The course presented can be studied in full-time mode over a period of four academic years (or five academic years for students accepted for entry via the Integrated Foundation Year). Each academic year of the course is arranged into 2 semesters - each semester is of 15 weeks duration. The learning is divided into study units called modules. All modules have been described at Levels 3, 4, 5 or 6. An Associate Bachelors' degree (AB) has been defined as an exit award.

With the exception of the Placement module, all modules have a credit value of 10, 15, 20 or 30 credit points. The Placement module has a credit value of 60 credit points. The credit value of a module is in proportion to the effort required from the student with 1 credit point corresponding to 10 hours of student work effort. Hence (for example) a 20-point module corresponds to 200 hours of student work effort.

Student work effort for a module includes activities such as attending lectures, tutorials, seminars and practical classes; preparing for and performing coursework; preparing for and sitting examinations; independent and directed self-study and so on.

Progression from Semester 1 to Semester 2 is automatic.

To be eligible to proceed to the next stage of the programme, a student needs to pass all modules (120 credit points).

The names of the modules within the course, the levels at which they are studied, the credit ratings and awards that may be gained are shown in the following table:

Level 4 Modules

Module Title	Credit		Module Status	Awards
	Level	Points		
Computing Foundations	4	20	Compulsory	-
Using the Web	4	20	Compulsory	-
Software Development I	4	20	Compulsory	-
Computer Technology	4	20	Compulsory	-
Web Information Systems	4	20	Compulsory	-
Software Development II	4	20	Compulsory	-

Level 5 Modules

Module Title	Credit		Module Status	Awards
	Level	Points		
Professional Issues & Enterprise	5	10	Core	1/12 (AB)
Data Structures	5	15	Compulsory	1/8 (AB)
Web Applications Development	5	20	Compulsory	1/6 (AB)
Game Design & Development	5	20	Compulsory	1/6 (AB)
Web Database Systems	5	20	Compulsory	1/6 (AB)
Systems Applications	5	15	Compulsory	1/8 (AB)
Knowledge Based Systems	5	20	Compulsory	1/6 (AB)

Exit Award: Associate Bachelors Degree in Computing
 Pass with Commendation 60%
 Pass: 40%

To be eligible for the award, a student needs to pass all modules (120 credit points). To gain a pass with Commendation, a student needs to achieve an overall average mark of 60%.

Placement Module

Module Title	Credit		Module Status	Awards
	Level	Points		
Placement module – Computing	5	60	Compulsory	DIS

Level 6 Modules

Module Title	Credit		Module Status	Awards
	Level	Points		
Software Project Management	6	10	Core	1/12 (Hons)
Project	6	30	Core	1/4 (Hons)
Multimedia	6	20	Option	1/6 (Hons)
Operational Research Methods	6	20	Option	1/6 (Hons)
Machine Learning & Data Mining	6	20	Option	1/6 (Hons)
Console Game Development	6	20	Option	1/6 (Hons)
3D Game Technologies	6	20	Option	1/6 (Hons)
Mobile & Networked Games	6	20	Option	1/6 (Hons)
Digital Image Processing	6	20	Option	1/6 (Hons)
Computer Networks	6	20	Option	1/6 (Hons)
Networks & Web Security	6	20	Compulsory	1/6 (Hons)
Advanced Database	6	20	Option	1/6 (Hons)
Intelligent Systems	6	20	Option	1/6 (Hons)
XML & Advanced Web Programming	6	20	Compulsory	1/6 (Hons)

NB:

- 1 All students must select a total of 2 Option modules (40 credits). These should be balanced across the 2 semesters i.e. 1 Option module (20 credits) per semester.

13 SUPPORT FOR STUDENTS AND THEIR LEARNING

Students and their learning are supported in a number of ways.

For students taking this Integrated Foundation Year, there will be:

- Exclusive use of a dedicated Computer Studio for student activities.
- A Year Tutor to oversee, coordinate and provide guidance on the student activities.

In addition, students and their learning will also be supported by:

- A series of phased Induction sessions to provide timely advice on the key aspects of the course provision.
- A Faculty Student Handbook to provide a guide to life as a student within the Faculty of Computing & Information Engineering.
- A Course Student Handbook to provide all the necessary information about the course.
- Module Handbooks (electronic or otherwise) to describe the content of each module delivered in a particular year.
- A Course Director who has responsibility for ensuring the smooth day-to-day operation of the course.
- An Adviser of Studies is allocated to each student. Advisers of Studies are members of staff with the responsibility of assisting students in their personal and career development.
- Personal Development Planning
- A centralised Accommodation Service that helps new and existing students explore the range of accommodation options available.
- A centralised Careers Service is available to help students determine their future career and support their applications for employment.
- A centralised Information Services Department with responsibilities covering library, academic and administrative computing, digital communications, audio-visual services and reprographic services
- A centralised Student Support Department is available to students who have problems with non-academic aspects of student life.
- A Sport and Recreation Department
- An International Office
- A Students' Union
- A Chaplaincy

14 CRITERIA FOR ADMISSION

Applicants must satisfy the University's general entry requirements as set out in the prospectus or demonstrate their ability to undertake the course through the accreditation of prior experiential learning (APEL). The initial offer standard may vary from year to year. See prospectus entry.

15 EVALUATING AND IMPROVING THE QUALITY AND STANDARD OF TEACHING AND LEARNING

Quality and standards are evaluated and improved through consideration of:

- External benchmark standards [identify QAA benchmark and PSRB benchmarks unless stated in section 11]
- Views of students as expressed through staff/student consultation, and the University student questionnaire on teaching and other questionnaires
- Views of graduates in the National Student Survey
- Views of employers
- Views of external examiners
- Student performance data and career progression
- University processes for initial approval, periodic re-approval and annual monitoring.

In addition, there are University/Faculty/School strategies for teaching and learning.

16 REGULATION OF STANDARDS

Assessment rules

The pass mark for course, modules and individual assessments is 40%

Performance levels for degree classification are as follows:

1 st Class	An overall average of at least 70%
2 nd Class Upper Division	An overall average of at least 60% and less than 70%
2 nd Class Lower Division	An overall average of at least 50% and less than 60%
3 rd Class	An overall average of at least 40% and less than 50%

External Examiners

There is one External Examiner for the course.

External examiners are academic subject or professional experts appointed from outside the University. Their key functions are to contribute to the assurance of the standards of the award and the fair treatment of students. They are involved in the moderation and approval of assessments and the moderation of the marking undertaken by internal examiners.

17 INDICATORS OF QUALITY RELATING TO TEACHING AND LEARNING

Selected indicators of quality relating to Teaching and Learning include:

- 25% of teaching staff are members of the British Computer Society
- Computing was awarded a Grade 4 in the 2001 Research Assessment Exercise
- A Discipline Audit Trail for Computing was examined as part of the 2005 QAA Institutional Audit with a number of positive comments. The following summary extract is appropriate:

“Computing programmes in the three Schools are defined appropriately and satisfy the requirements of professional accreditation where relevant. A review of assessed work confirmed that the standards achieved by students are appropriate to the titles of the awards and their location in FHEQ. The quality and extent of the DSED impressed the audit team, as did the articulation by staff of their commitment to the continual development and refinement of their courses and their attendance to issues such as student retention in very positive and supportive ways. Students felt that staff were very approachable and helpful, and this contributed significantly to a positive student learning experience. The quality of learning opportunities is suitable for the programmes of study leading to the named awards.”

Report at: <http://www.qaa.ac.uk/reviews/reports/instReports.asp?instID=H-0185>

18 TABLE OF MODULES

Modules at Level 4

BSc Hons Computing (Internet Systems) DIS/DAS

Yr	Sem	Level	Module Title	Code (xxx = new module-code to be allocated)	Credit Value	Status	Current, Revised or New	Assessment Methods (%)		Contribution to overall mark of FINAL Award
								Exam	CW	
1	1	4	Computing Foundations	COM165	20	Compulsory	Revised	50	50	-
1	1	4	Using the Web	COM103	20	Compulsory	New	50	50	-
1	1	4	Software Development I	COM135	20	Compulsory	Revised	50	50	-
1	2	4	Computer Technology	COM166	20	Compulsory	Revised	75	25	-
1	2	4	Web Information Systems	COM104	20	Compulsory	New	50	50	-
1	2	4	Software Development II	COM138	20	Compulsory	Revised	50	50	-

Modules at Level 5
BSc Hons Computing (Internet Systems) DIS/DAS

Yr	Sem	Level	Module Title	Code	Credit Value	Status	Current, Revised or New	Assessment Methods (%)		Contribution to overall mark of Exit Award
								Exam	CW	
2	1 & 2	5	Professional Issues & Enterprise	COM411	10	Core	Revised	0	100	1/12 (AB)
2	1	5	Advanced Software Development	COM316	15	Compulsory	Revised	75	25	1/8 (AB)
2	1	5	Web Applications Development	COM438	20	Compulsory	New	0	100	1/6 (AB)
2	1	5	Game Design & Development	COM436	20	Compulsory	Revised	50	50	1/6 (AB)
2	2	5	Web Database Systems	Com302	20	Compulsory	New	50	50	1/6 (AB)
2	2	5	Systems Applications	COM356	15	Compulsory	Revised	75	25	1/8 (AB)
2	2	5	Knowledge-based Systems	COM340	20	Compulsory	Revised	75	25	1/6 (AB)

Exit Award: Associate Bachelor's Degree in Computing

3	4	5	DIS/DAS Placement: Computing	COM367	60	Compulsory	Current	0	100	DIS
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Potential Exit Award: Associate Bachelor's Degree in Computing with DIS

Modules at Level 6
BSc Hons Computing (Internet Systems) DIS/DAS

Yr	Sem	Level	Module Title	Code	Credit Value	Status	Current, Revised or New	Assessment Methods (%)		Contribution to overall mark of the Final Award
								Exam	CW	
3 / 4	1	6	Software Project Management	COMxxx	10	Core	New	50	50	1/12
3 / 4	1 & 2	6	Project	COM570	30	Core	Current	0	100	1/4
3 / 4	1 & 2	6	Multimedia	COMxxx	20	Option	New	75	25	1/6
3 / 4	1	6	Operational Research Methods	COM551	20	Option	Revised	75	25	1/6
3 / 4	1	6	Machine Learning & Data Mining	COM542	20	Option	Revised	75	25	1/6
3 / 4	1	6	Console Game Development	COM569	20	Option	Revised	75	25	1/6
3 / 4	2	6	3D Game Technologies	COM523	20	Option	Revised	75	25	1/6
3 / 4	2	6	Mobile & Networked Games	COMxxx	20	Option	New	75	25	1/6

Modules at Level 6 (continued)
BSc Hons Computing (Internet Systems) DIS/DAS

Yr	Sem	Level	Module Title	Code	Credit Value	Status	Current, Revised or New	Assessment Methods (%)		Contribution to overall mark of the Final Award
								Exam	CW	
3 / 4	2	6	Digital Image Processing	COM536	20	Option	Revised	75	25	1/6
3 / 4	2	6	Computer Networks	COM548	20	Option	Revised	75	25	1/6
3 / 4	1	6	Networks & Web Security	COMxxx	20	Compulsory	New	75	25	1/6
3 / 4	2	6	Advanced Database	COM572	20	Option	Revised	75	25	1/6
3 / 4	2	6	Intelligent Systems	COM524	20	Option	Revised	75	25	1/6
3 / 4	2	6	XML & Advanced Web Programming	COMxxx	20	Compulsory	New	50	50	1/6

6. PROGRAMME REGULATIONS

UNIVERSITY OF ULSTER

1. PROGRAMME TITLE AND CODE

BSc Hons Computing (Internet Systems) DIS/DAS

2. MODE OF ATTENDANCE

Full-Time

3. DURATION

FULL-TIME SANDWICH: Normally 4 years (6 semesters of study and placement year)

4. LOCATION

Coleraine

5. FACULTY

Engineering

6. ADMISSION REQUIREMENTS

6.1 Applicants must:

- (a) Satisfy the University's general entrance requirements
- (b) Have a specified minimum of points at A-level.
- (c) Hold at least five GCSE passes (or equivalent) at grade C or above. These must include passes in English and Mathematics.

No subject may be counted at more than one level except in the case of the Intermediate GNVQ and Advanced GNVQ/Vocational A level.

The University will accept as alternative qualifications:

1. One VCE A level and either three passes at GCSE (grade C or above) or an Intermediate GNVQ.
2. A BTEC National Certificate or Diploma awarded by the Edexcel Foundation.
3. Four Highers and/or Advanced Highers of the Scottish Qualifications Authority.
4. The European or International Baccalaureate.
5. An Irish Leaving Certificate with passes in four approved subjects at grade C Higher level.
6. Satisfactory completion of an approved Access course.

Applications from persons who hold other qualifications will be considered on merit.

7. EXEMPTIONS

- 7.1 Studies pursued and examinations passed in respect of other qualifications awarded by the University or by another university or other educational institution may be accepted as exempting candidates from part of an approved Programme provided that they shall register as students of the University of Ulster for modules amounting to at least the final third of the credit value of the award at the highest level.

8. PLACEMENT

The third year of the Programme is spent on placement. For the award of Diploma in Industrial Studies the period of full-time work experience must last at least 25 weeks. During the placement year students are expected to adhere to the normal attendance practices of their place of employment. An industrial supervisor from the employing company and an academic supervisor from the Faculty is assigned to each student.

Assessment

Assessment of placement is on the basis of three elements:

(a) *Student Report*

Each student is required to maintain a log of the placement experience and incorporates this in an end of placement year report. The report will normally comprise approximately 3000 words and will include an evaluation of the overall placement experience.

(b) *Academic Supervisor's Report*

Each academic supervisor submits a report on student performance based on interviews with both the student and the student's industrial supervisor.

(c) *Assessment by the Industrial Supervisor*

The employer, normally in the person of the industrial supervisor, completes a standard Employer Assessment Report covering all aspects of the student's performance on placement.

Performance on placement will be based on the Student Report (40%), the Academic Supervisor's Report (30%) and Assessment by the Industrial Supervisor (30%).

To be eligible for the award of Diploma in Industrial Studies the candidate must obtain a mark of at least 50% and complete the Programme.

A candidate who achieves a mark of 70% or more, and completes the Programme is eligible for the award of Diploma in Industrial Studies with Commendation.

Candidates who do not obtain a mark of at least 50% but who obtain at least 40% will be deemed to have completed the placement satisfactorily but will be ineligible for the award of Diploma in Industrial Studies. Such candidates will be required to transfer to the (related) BSc (Hons) Computing degree Programme.

Progression

In order to progress to the fourth year of the Programme a candidate must obtain a pass mark of at least 50% for placement and complete any outstanding Year 2 modules.

A candidate whose performance on placement is regarded as unsatisfactory by the Board of Examiners may be required to repeat placement or withdraw from the Programme or from the University.

A candidate on placement who fails a resit examination or fails to complete supplementary course work satisfactorily and is required to retake examinations in the following year may, at the discretion of the Board of Examiners, be permitted to complete the placement.

Exemption

Exemption from placement will be awarded only in the most exceptional circumstances. To be so exempted a candidate must satisfy the Board of Examiners that he/she has acquired work experience equivalent to placement. A candidate must submit an application for exemption that includes a report (approximately 2,000 words) outlining the extent and level of the work experience already obtained, together with a report from his/her employer(s). A sub-committee consisting of the Course Director and the Placement Tutor will assess the application. They will then make a recommendation to the Board of Examiners. An interview with the candidate may form part of the assessment process.

A candidate who is exempted from placement will not be eligible for the award of Diploma in Industrial Studies. Such candidates will be required to transfer to the (related) BSc (Hons) Computing degree Programme.

Special Circumstances

A candidate on placement who is unable to complete his or her placement due to illness or other circumstances may, at the discretion of the Board of Examiners, be awarded the DIS and proceed to the final year of the Programme. Normally such candidates must have completed a minimum of 25 weeks on placement.

Exceptionally, a student who is unable to obtain placement or who does not complete placement satisfactorily, may, at the discretion of the Board of Examiners, be permitted, to:

- (a) transfer to an equivalent Programme without a placement element.
- (b) obtain leave of absence to continue seeking a suitable placement.

9. ATTENDANCE REQUIREMENTS

- 9.1 Students are expected to attend all classes associated with the Programme and be punctual and regular in attendance.
- 9.2 A student who has not been in attendance for more than three days through illness or other cause must notify immediately the Course Director. The student shall state the reasons for the absence and whether it is likely to be prolonged. Where the absence is for a period of more than five working days, and is caused by illness which may affect their studies, the student shall provide appropriate medical certification in accordance with the General Regulations for Students.
- 9.3 Students who are absent without good cause for a substantial proportion of classes may be required to discontinue studies, in accordance with the General Regulations for Students.

10. RULES GOVERNING STUDENT CHOICE

- 10.1 Modules are offered as indicated in the attached table. Revisions may be made in accordance with the University's quality assurance procedures. Module availability may vary.

11. EXAMINATION AND ASSESSMENT

- 11.1 The performance of candidates shall be assessed by the Board of Examiners in accordance with the Regulations Governing Examinations in Programmes of Study.
- 11.2 Candidates shall be assessed in the modules for which they have enrolled in each year of study. At the discretion of the Board of Examiners candidates may be required to attend a viva voce examination.
- 11.3 Within each module candidates shall be assessed by coursework, or a combination of written examination and coursework in accordance with the attached table.
- 11.4 The pass mark for the module shall be 40%. Where a module is assessed by a combination of coursework and examination a minimum mark of 35% shall be achieved in each element.
- 11.5 The pass mark for placement is 50%; a mark of 40% is sufficient for progression to the next stage of the (related) BSc (Hons) Computing degree Programme.

12. SUBMISSION OF COURSEWORK

- 12.1 Coursework must be submitted by the dates specified by the Course Committee.
- 12.2 Students may seek prior consent from the Course Committee to submit coursework after the official deadline; such requests must be accompanied by a

satisfactory explanation, accompanied in the case of illness by a medical certificate. This application shall be made to the Course Director.

- 12.3 Coursework submitted without consent after the deadline shall not normally be accepted.

13. PROGRESS

- 13.1 Subject to 14 and 15 hereof, candidates are required to pass all modules in each year of study in order to proceed to the next. Progress from semester 1 to semester 2 is automatic.

14. CONSEQUENCES OF FAILURE

- 15.1 Candidates who fail to satisfy the Board of Examiners in assessment may be permitted at the discretion of the Board to re-present themselves as specified in 15.2 for one or more supplementary examination and repeat such coursework or other assessment requirements as shall be prescribed by the Board. Such candidates may be exempted at the discretion of the Board from the normal attendance requirements. Where candidates are required to repeat coursework or to take a supplementary examination the original mark in the failed coursework component or examination shall be replaced by a mark of 40% or the repeat mark whichever is the lower for the purpose of calculating the module result.
- 15.2 In each year, other than the final year, the consequences of failure shall normally be as follows:

Failure at the First Attempt

Failure in modules with an overall value of up to and including 60 credit points Repeat specified examinations and/or coursework in the failed modules (examinations August)

Failure in modules with an overall value of 70 or 80 credit points Repeat specified examinations and/or coursework in the failed first semester module(s) (examinations January) and of specified examinations and/or coursework in the second semester modules (examinations May) with or without attendance OR withdraw from the Programme or discontinue studies at the University of Ulster.

Failure in modules with an overall value of more than 80 credit points Withdraw from the Programme or discontinue studies at the University of Ulster.

Failure by candidates in year 2 of sandwich Programmes Exceptionally, second year students on sandwich Programmes may be permitted to commence the placement period, pending a requirement to present themselves for supplementary written examinations or to repeat coursework.

Failure at the Second Attempt

Failure in modules with an overall value up to and including 20 credit points Provided that the module(s) are not prerequisite(s), proceed to next year and repeat *once only* specified examination(s) and/or coursework in the failed module(s) at the next examination period (January or May).

Failure in modules with an overall value up to and including 40 credit points (except as above) Repeat *once only* specified examination(s) and/or coursework in the failed module(s) at the next examination period (January or May or August if semester already repeated) with or without attendance (progress to next year not permitted).

Failure in modules with an overall value of more than 40 credit points Withdraw from the Programme or discontinue studies at the University of Ulster.
Consequence of failure in placement year

Failure at the First Attempt

Failure in placement Repeat once only all or part of placement

Failure at the Second Attempt

Failure in placement Withdraw from the Programme.

15.3 Failure in the Final Year

In the final year of an Honours degree the consequences of failure shall normally be as follows:

Failure in modules with an overall value up to and including 20 credit points Repeat specified examination(s) and / or coursework in the failed module(s) (one attempt only) in consideration for Honours classification (examinations August).

Failure in modules with an overall value of 30 or 40 credit points Repeat specified examination(s) and / or coursework in the failed module(s) (one attempt only) in consideration for the award of an unclassified Honours degree (examinations August)

Failure in modules with an overall value of more than 40 credit points Withdraw from the Programme or discontinue studies at the University of Ulster.

15. CLASSIFICATION OF FINAL RESULT

15.1 The attached table indicates the contribution of each module/level to the final award. The overall result of candidates shall be based on their performance in level 6 modules only.

15.2 Classification of Final Result (Honours Degree)

The following percentages shall be used as a basis for determining candidates' overall gradings:

Class I	At least 70%
Class II (division i) (Ii)	At least 60% and less than 70%
Class II (division ii) (Ii)	At least 50% and less than 60%
Class III	At least 40% and less than 50%

Candidates who have not qualified for a classified award and who are permitted to re-present themselves for assessment in accordance with 14.3 hereof shall be required to achieve an overall mark of at least 40% in order to be considered for the award of a classified or an unclassified Honours degree.

15.3 Award of Diploma in Industrial Studies

The following shall be the minimum percentages used in determining the overall gradings of candidates in the Diploma.

Pass with Commendation	70%
Pass	50%

15.4 Award of Associated Bachelor degree in Computing Studies

A candidate who satisfies the requirements at Level 5 of the course may at the discretion of the board of examiners may be awarded an Associated Bachelors degree as an exit award. The minimum percentages being used in determining the overall grading of candidates in the AB are:

Pass with Commendation	60%
Pass	40%

Subject to an outcome commensurate with Section 15.3, a Diploma in Industrial Studies may be awarded together with the AB award.

16. ILLNESS AND OTHER EXTENUATING CIRCUMSTANCES

16.1 In any year other than final year

The Board of Examiners may in the case of candidates who are prevented by illness or other sufficient cause from taking or completing the whole or part of the assessment during the Programme, or whose results are substantially affected by illness or other sufficient cause, permit the candidates to complete, take, or repeat the assessment in one or more modules at an approved subsequent date.

16.2 Final year (Honours Degree)

The Board of Examiners may in the case of candidates who are prevented by illness or other sufficient cause from taking or completing the whole or part of the final stage assessment or whose results are substantially affected by illness or other sufficient cause:

- (a) permit the candidate to complete, take, or repeat as candidates for the Honours degree, the assessment in one or more modules at an approved subsequent date; **or**
- (b) deem the candidate to have passed and recommend an Aegrotat degree.

- 16.3 Before an Aegrotat award is recommended a candidate must have signified that he or she is willing to accept the award.

17. REVISIONS TO REGULATIONS

These regulations may be revised during the student's period of registration in accordance with the procedures approved by Senate.