



Griffith College

Higher Diploma in Science (Computing) in
Web Development

Programme Content Quick Guide

2016-17

Faculty of Computing Science

Griffith College Dublin

Semester 1 (Full Time)

Module Title	ECTS Credits	Allocation of Marks			
		C.A. %	Proj. %	Prac. %	Final. %
Object Oriented Programming	10	60			40
Relational Databases	5	50			50
Architecture and Operating Systems	5	50			50
Computer Networks	5	50			50
Web Development & UI Design	5	100			

Semester 2 (Full Time)

Module Title	ECTS Credits	Allocation of Marks			
		C.A. %	Proj. %	Prac. %	Final. %
Server Side Web Development	5	50			50
Society and the Web	5	50			50
Cloud Services and Platforms	5	50			50
Professional Certification	5	50			50
Project	10		100		

Work Placement (Full Time)

Module Title	ECTS Credits	Allocation of Marks			
		C.A. %	Proj. %	Prac. %	Final. %
Industry Placement	30	100			

* For part time delivery of the programme, the modules are delivered in four semesters, over a period of two years, and where applicable, the work placement is replaced by the industry project.

Griffith College Programme Content Quick Guide

Note: whilst all efforts have been made to make sure the information presented below is accurate; this should be considered a guide to course content and structure and not an official document.

Higher Diploma in Science in Web Development

NFQ Level: 8

Credits: 90

Educational Objectives and their Assessment

The aims of the programme are to develop learners to be able to:

1. Demonstrate detailed knowledge of the range of theories, concepts and constructs underpinning the field of computer science
2. Design, develop, test and debug software applications using an object-oriented programming language utilising core object-oriented programming concepts.
3. Implement basic algorithms and data structures using an object-oriented programming language
4. Design and implement a relational database solution to a business information problem
5. Use project management principles and OO Analysis and design techniques to the design of a software solution to a business problem
6. Design and build Web-site using appropriate design principles.
7. Understand the basic architecture and operation of a micro-processor based system.
8. Explain network models such as OSI and TCP/IP and the process of data encapsulation
9. Plan, implement and test a network using appropriate hardware and configuration

On completion of the Web Development Specialisation semester learners will be able to:

1. Create dynamic database-driven web applications
2. Employ alternative Agile Development Strategies
3. Use standard components of Web 2.0 such as CSS, AJAX, COMET and Web Services
4. Describe Cloud services, Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS)

5. Understand Service Oriented Architectures, SOAP, REST, XML-RPC, WSDL
6. Develop small applications for Mobile Platforms backed up by powerful cloud services
7. Discuss some of the theoretical paradigms of technology and society
8. Understand the importance of Social Media in business
9. Discuss ethical issues that arise in a Globally connected society, particularly in relation to marginalised groups

Module 1: Object Oriented Programming

The module aims to enable the learners to:

1. Design, develop, test and debug software applications using an object-oriented programming language utilising core object-oriented programming concepts
2. Specify precisely the syntax and semantics of an object oriented programming language
3. Select an appropriate program construct (or datatype) to achieve a given task
4. Design a systematic suite of tests for a given program and implement it
5. Prepare the text of a program in a well-formatted, conventional manner and develop these programme using an integrated development environment
6. Implement basic algorithms and data structures using an object-oriented programming language
7. Implement basic concurrent threads using an object-oriented programming language.

Module Objectives:

This module teaches the learner how to design high-quality programs in a systematic way. All the relevant concepts and techniques are explained and exemplified in the clearest, simplest language.

Module 2: Relational Databases

The module aims to enable the learners to:

1. Analyse the goals, functions, models, and components of database management systems
2. Explain the context, phases, and techniques for designing and building databases
3. Select and apply appropriate design models to a given development environment
4. Design and implement a relational database schema for a software application
5. Query a relational database using SQL
6. Connect a database to a larger software development environment
7. Evaluate and use non-relational data storage technologies

Module Objectives:

This module teaches the learner the basic theoretical ideas that underpin modern database management systems. In parallel with this it shows the learner how to design and implement databases. They learn techniques such as entity-relationship modelling and normalisation in order to more effectively design a database. They also learn the structured query language (SQL) so as to allow them to implement their design in a commercial database management system.

Module 3: Architecture and Operating Systems

The module aims to enable the learners to:

1. Understand the basic architecture and operation (processing, storage and communication) of a micro-processor based system
2. Describe the operation of basic processors and explain the concepts of interrupts and I/O operations
3. Identify and describe the internal hardware architecture and system software of a computer and illustrate how these components interact
4. Demonstrate a knowledge of the main types of memory, storage and peripheral devices
5. Describe the operation of basic processors and explain the concepts of interrupts and I/O operations
6. Discuss the nature, origin and function of operating systems at a generic level
7. Understand issues of resource management, security and protection in relation to Operating Systems
8. Demonstrate the ability to convert numerical data from one format to another
9. Design and simplify logic circuits using Boolean algebra

Module Objectives:

This module provides the learner with the knowledge of how computers work. There are two main strands to the module. Computer Architecture addresses how the individual components work together. The second strand concentrates on the Operating System, the software that allows all the components to communicate, and manage data so that the user can concentrate on high level problems.

Module 4: Computer Networks

The module aims to enable the learners to:

1. Explain signalling and modulation
2. Demonstrate an understanding of network connectivity, media, wireless and network devices.
3. Discuss switching techniques and network addressing
4. Show familiarity with Communication protocols
5. Understand concepts of error detection techniques used in communication systems
6. Understand the concepts of routing techniques for data through data networks
7. Recognise concepts of congestion problems and congestion controls
8. Make informed decisions on the construction of computer networks and computer communication systems and internets
9. Construct a basic computer network

Module Objectives:

The module is designed to give the learners an introduction to the practical issues in designing, building and troubleshooting a network. The learners study the theory underlying the topic and have an opportunity to work in a practical way designing and building a LAN. Issues of security and integrity controls are introduced and developed further in later modules.

Module 5: Web Development & UI Design

The module aims to enable the learners to:

1. Design and build a UI for a web application using appropriate UI design principles
2. Use a user-centred approach to design applying concepts of usability and user experience
3. Describe the architecture of the web and web applications with particular reference to client and server side applications.
4. Develop a client-side web application

Module Objectives:

The Web has become a vital medium for communication, commerce and technology and increasingly web-based applications are being used in lieu of traditional software solutions. Knowledge of web technology is critical for people working in the ICT area. This module aims to equip learners with the knowledge needed to understand how the web works, and the skills necessary to build compelling and usable web interfaces, using web standards for structure (HTML5), presentation (CSS) and rich behaviour (JavaScript).

Module 6: Server Side Web Development

The module aims to enable the learners to:

1. Write interactive server-side scripts
2. Create dynamic database-driven web applications
3. Understand and implement security features for client-side web applications
4. Build a state-based user experience on top of stateless protocols
5. Use asynchronous client-side scripts to communicate with a web server
6. Design server-side web application architectures.

Module Objectives:

This module teaches learners how to design and build dynamic, database driven web applications. Building on the Web and UI Design module, learners learn how to build ‘three-tier’ web applications, with server-side scripting languages and relational databases, with client-side HTML front-ends. Learners also learn about building stateless and asynchronous user experiences and consider security implications.

Module 7: Society and the Web

The module aims to enable the learners to:

1. Discuss some of the theoretical paradigms of technology and society
2. Explain the implications of new technologies on work practices
3. Articulate a personal perspective on the relationship between the Web and Society
4. Understand the importance of Social Media in business
5. Discuss ethical issues that arise in a Globally connected society, particularly in relation to marginalised groups
6. Discuss data protection and privacy issues in relation to Web based data

Module Objectives

The module examines the social implications of a Web based technology. With the development of the Web and particularly with ubiquitous access through mobile technologies the Web is becoming central to information processing in society. What are the implications of this for society, and for developers of Web content? The module seeks to develop a questioning culture amongst the learners who develop a holistic view of how technology shapes the world we live in and the world they live in shapes the technology we develop.

Module 8: Cloud Services and Platforms

The module aims to enable the learners to:

1. Identify problems with existing software development strategies as applied to web-design
2. Employ alternative Agile Development Strategies
3. Use standard components of Web 2.0 such as CSS, AJAX, COMET and Web Services
4. Explain the architecture of the Web
5. Describe Cloud services, Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS)
6. Understand Service Oriented Architectures, SOAP, REST, XML-RPC, WSDL
7. Explain the role of virtualisation in the Cloud
8. Develop, deploy, and configure a Cloud application (e.g. EC2)

Module Objectives

The module aims to introduce the learner to modern web based services, their architecture, design and implementation. The emergence of web-services in the Cloud has opened up the need for new approaches to software development and deployment. The wide-spread use of mobile applications (typically backed up by a cloud infrastructure which performs the heavy lifting) has also brought new challenges and opportunities. A significant part of the assessment involves the learner developing a web application, deploying it to the Cloud and configuring for and evaluating performance post installation. Assessment emphasises a collaborative group approach to equip the learners with the skills required to work in a successful agile software development team.

Module 9: Web Development Professional Certification

The module aims to enable the learners to:

1. Understand the PHP language, syntax, object oriented programming and arrays.
2. Write complex server-side PHP scripts.
3. Create database-backed web applications.
4. Understand data formats & types, strings and patterns.
5. Identify security issues and solutions.
6. Be familiar with and use web features.

Module Objectives:

This module seeks to give the learner an understanding and knowledge of the PHP language, its syntax, features and data structures, its use in server-side database backed web applications and security issues related to its use. The module particularly focusses on material which is related to Zend professional certification. Learners are in a position to take the PHP 1 Zend examination having completed the module.

Module 10: Development Project

The module aims to enable the learners to:

1. Draw on the reflective insights and skills imparted by the programme to carry out a systematic piece of research and development
2. Integrate the learning on the programme in an effective way by undertaking a project of professional and institutional relevance
3. Use technical design and implementation skills
4. Reason in a consistent and methodological manner at an abstract level
5. Research, analyse and draw conclusions in a systematic manner
6. Write coherently and present information in a systematic manner to the required academic level
7. Utilise research methodologies and presentation skills
8. Undertake a technical project and bring it to completion
9. document, at a level befitting a professional, the complete project life-cycle from requirements acquisition to product testing
10. Develop the awareness necessary to become a skilled reflective practitioner of Computing Science

Module Objectives:

In the Project module the learners complete a large piece of work, encompassing both research and development. They get the opportunity to work closely with a member of the lecturing staff. They are required to produce complete a software application and to document the process.

They not only learn new technical skills but also learn how to conduct valid academic research and to develop a software product to industry standards.

Teaching in this module is conducted mainly through one-on-one meetings between the learner and the supervisor. However, in the early stages of the process the Faculty organises a number of relevant seminars. Topics for these include: Writing a project proposal; Referencing; Report writing; Research skills; Online resources etc.

The skills that the learners develop in the Project module benefit them in all areas of their chosen careers, either in the computing industry or if pursuing further studies.

Module 11: Industry Placement

The module aims to enable the learners to:

1. Demonstrate competency working in the principal areas of Computer Applications
2. Show awareness of the problems of the business environment into which most computer-based applications have to fit
3. Apply all aspects of professional development to become impressive ambassadors of Computing Science
4. Recognise the depth of study and research available within a computing specialisation and develop an enthusiasm to keep abreast of such research to avoid duplication of effort
5. Work effectively in business application software development teams
6. Select and apply appropriate techniques to particular development projects
7. Communicate effectively, both orally and in writing with their peers, managers, users and the general public
8. Confidently and responsibly tackle a wide range of problems arising in work and life generally

Module Objectives:

The purpose of the industry placement is to provide the learner with an opportunity to consolidate all the material taught in the previous modules by applying it to real problems within an IT environment. Given its central role in setting all the other modules in the context of a working IT environment, many of the specific aims and objectives of the programme are considerably advanced by the Industry Placement Module;

The placement involves a minimum of three months on the job training within a sponsoring company. The learner is monitored both by their immediate company manager and by the Faculty Industry Liaison. The learner is obliged to keep a daily record of their work-experience during their placement. Through their placement they gain experience in a number of challenging computing tasks and have to meet the normal deadline demands of the industry.