

Short Module Descriptors – Undergraduate Computing - LEVEL 4

Regular updates may mean that exact module titles and descriptions may differ.

COMP1421: Foundations of Computing

This module aims to provide the foundational skills and teach the necessary concepts that are required to engage and progress on a Computing course. On completion of this module students will be equipped with the necessary grounding to confidently engage with the discipline of Computing.

Sample assessment: Group Presentation, Learning Log and Quiz

COMP1431: Introduction to Game Design & Development

Creating successful games is a multidisciplinary challenge requiring technical competences as much as a thorough understanding of game-play theories and players. This module starts a learning journey aimed at acquiring academic, technical and creative skills required to design and develop quality games. Students will be introduced to principles and practices for the analysis of games and players, and for the design and rapid prototyping of games. Students will also develop important transferable skills such as problem-solving and systems thinking, key to enhancing employability in all technical and creative domains of the computing industry.

Sample assessment: A game design portfolio and a related individual project journal.

COMP1441: Web Technologies

This module provides the knowledge of the principles and practice of building interactive web pages and applications using current client-side technologies including HTML5, CSS3 and JavaScript. The module equips you with key development skills to create standards-compliant, accessible and dynamic websites while gaining practical insights into the nature of contemporary web development. You will explore the website development life-cycle from planning to final publication and apply these skills in the design and implementation of an interactive websites based on your area of interest.

Sample assessment: Design a Website

COMP1442: Creative Computing

This module introduces you to computer graphics. You will learn still image manipulation, photo retouching, logo design and publication design. You will investigate current trends, techniques and industry standards; explore legal and technical issues related to image creation within the computing arena and gain practical skills with industry standard software.

Software used: Adobe Creative Cloud: Photoshop, Illustrator, InDesign.

Sample assessments: Develop a 4 page brochure advertising a specific product.

COMP1447: Introduction to Object Orientated Programming

This module will teach the essential elements of creating a software solution for a given problem. Students will develop computational thinking skills, such as problem decomposition, pattern recognition, abstraction and algorithmic design. They will learn programming constructs, including the process of writing and debugging software, and fundamental elements of computer science such as data structures and algorithms. This module is practical-based and students will gain real-time experience of the development process.

Sample assessment: Portfolio and in class practical assessment and Portfolio

COMP1482: IT Systems Fundamentals

In the working world, we are now surrounded by information systems with many differing uses, it is imperative that the modern computing professional is conversant in these systems. Employers are increasingly saying to universities that these skills are what they want and need for graduate employees, so this module provides an introduction to these types of information systems, why they are used and how they are procured and developed. The module gives hands-on experience of using some of these systems and addresses the need to organise and manage systems to resolve user issues within a context of fast-paced change.

Sample assessment: Report & Reflective Journal

Short Module Descriptors – Undergraduate Computing - LEVEL 5

COMP2403: Robotics

Robots are commonly used in many organisations including manufacturing, space exploration, driverless cars, and health. This module will focus on two-wheeled “autonomous robots” which can navigate, explore and carry out functions without a direct human controller. You will learn the workings of robot sub-systems, (such as sensors and motors), and also about software architectures which control these sub-systems, to achieve goals such as obstacle avoidance and various forms of navigation. The module includes a “design-build-test” engineering project where you will develop a two-wheeled robot to solve a given problem.

Sample assessment: Viva Voca

COMP2411: Systems Analysis, Design and Development

Whether you have a passion for programing, interface design or analysing this module will enable you to strengthen future job applications and prepare the groundwork for a career in the Computing field. Throughout this module you will build your knowledge and understanding of the whole development lifecycle with a particular focus on systems analysis and design. You will be guided through the entire process from project initiation, requirements gathering, methodological approaches and modelling techniques for systems analysis and design through to working as part of a team to plan, build and showcase a prototype.

Sample assessment: Portfolio and Group Project

COMP2421: Distributed Systems

Distributed systems are increasingly common in modern life and include multiplayer online games, peer-to-peer file sharing networks, smartphone apps and even cash points. Each of these share a commonality where disparate computers work autonomously towards a common goal and are connected together to form a large system. This module gives students first-hand experience of the technologies, algorithms and techniques used to implement such systems as well as evaluating their pros and cons.

Sample assessment – Portfolio

COMP2431: Object Orientated Design & Development

Object-oriented design and development is paramount for the creation of software systems in important domains such as web, mobile, game and enterprise computing. This module studies the foundations of modern object-oriented development approaches. Students will learn to analyse, design, implement and test software using the principles of object-oriented programming. This module is practical-based and students will gain real-time experience of the development process.

Sample assessment: Team software Portfolio and in class practical

COMP2441: Web Application Development

This module provides an in-depth understanding of key technologies and practice of building dynamic applications and websites using client-side and server-side technologies. You will learn to build robust and interactive client-side applications that run in the browser on the user’s device, and secure server-side applications that respond to request from the client-side web browser, whilst considering accessibility, usability and techniques to support mobile devices. You will also develop the practical skills required to integrate databases into web applications and explore web security issues. The module forms the basis for the kinds of interactive, high-performance, networked web apps that are popular in industry today.

Sample assessment – Practical assessment: Design a Website - Practical assessment 2: Implement a database driven website to solve a set of business requirements.

COMP2443: Advanced Creative Computing

This module introduces you to animated computer graphics. You will learn video processing, audio manipulation, animation, and video creation. You will investigate current trends, techniques and industry standards; explore legal and technical issues related to video creation within the computing arena and gain practical skills with industry standard software.

Software used: Adobe Creative Cloud: Photoshop, After Effects, Illustrator, InDesign, Audacity.

Sample assessments: Create a 30 second animated commercial for a specific product.

COMP2445: Data Mining

This module will look at how large pre-existing data sets can be mined for business and societal benefit along with algorithms and techniques for data mining, exploring pattern discovery and cluster analysis and using data mining tools and online services for data retrieval and analytics. It will also include such areas as; factor analysis, neural networks, decision trees and scoring. The module will also introduce the nature of knowledge and how the brain takes in information. It will explore Linked Open Data (LOD), Data Visualisation Tools and Platforms, Geo-Spatial Data Visualisation, Making Sense of Web Data, UX and Dashboard Design.

Sample assessment: Report and Artefact

COMP2451: Game Design & Engineering

Digital gaming is pervasive, involving hundreds of millions of players worldwide. The domains of gaming are rapidly evolving, offering new opportunities to game creators, as provided by the social networking and mobile gaming “revolutions”. Succeeding in this vibrant context demands conceiving and developing products capable of satisfying increasingly demanding communities of players. This module studies game design and development theories and methods, and their application to create engaging games in different domains of gaming. Students will also develop transferable skills to enhancing employability in many technical and creative fields of computing.

Sample assessment – Game design and development portfolio

COMP2461: Mobile Application Development

Mobile devices have redefined how we use technology. This module will introduce students to the practical aspects of developing applications for mobile. Students will explore the platforms, tools, technologies and design constraints that make developing mobile applications unique. Building on existing software development skills, students will develop their skills to design, build, test and deploy a mobile application.

Sample assessment – Presentation, Report & Artefact

COMP2462: Interaction Design

Interaction design is about developing interactive products that are easy, effective, and pleasurable to use. This module will equip you with knowledge and understanding of the principles and practices of interaction design.

Sample assessment - Artefact plus supporting design documentation

Short Module Descriptors – Undergraduate Computing – LEVEL 6

COMP3401: Computing Project

In this module, students will select a particular area of interest with the discipline of Computing and carry out focussed research into this area. Possible areas of research will be suggested by the computing tutors, although students may suggest an alternative topic. Some projects involve the production of a computer artefact and primary research on this artefact; others involve primary research without the creation of an artefact. All projects will include a literature review and a project management plan. There will be several taught sessions discussing the literature review, approaches to qualitative and quantitative research and management of the project.

Sample assessment – Project written report

COMP3402: The Nature of Computing

This module will bring together various foundational elements of Computing you have been studying, such as abstraction, solving problems, principles of good design and computers interacting with people and the real world. It will also extend these, providing you with an understanding of operating systems, scientific, engineering or medical applications, and alternative and emerging technologies such as quantum computing. You will also learn about ‘founding fathers’ of computing such as Alan Turing who provided us with the ‘abstract’ theoretical computer, and how his machine is realised through engineered CPUs, or smart-phone microcontrollers. You will learn how an understanding of our natural world helps the creation of digital worlds. While the module is definitely ‘hands-on’ there will be a lot of ‘thinking’ on this module which will help you to become a life-long learner, an important employability skill.

Sample assessment: A portfolio of position papers

COMP3404: Applied Software Engineering

The challenging complexity of modern software engineering projects demands the application of contemporary design methodologies and programming techniques. This module studies core problems underlying advanced real-world applications, and modern approaches to their solutions in domains such as industrial automation, cyber-security, broadcast, telecommunications, and computer games. Students will engage in challenging problem-solving scenarios to create efficient software systems using advanced software engineering techniques. This module will facilitate the development of important transferable skills such as problem-solving, modelling, critical thinking, systems thinking and teamwork, essential to enhance employability in all technical and creative domains of the computing industry.

Sample assessment: Individual portfolio and Team Project

COMP3405: Drones: Technology, Legislation and Safety

This module will focus on applying unmanned aerial vehicle technologies and systems (drones) to a variety of sectors and applications in this exploding field. Students will develop a thorough understanding of the relevant aspects of UAS basics, operations, regulations, risk management and flight. Students will learn how drone technology can be applied to a variety of business and scientific sectors in helping with practical solutions (e.g.) imagery, video, fieldwork planning, sensor and data analysis, mapping).

The practical project will explore current technology and its application to the business or research environment, allowing the student to explore areas of personal and career focused interest.

Sample assessment: Planning documentation & practical project

COMP3407: Machine Learning

Machine learning transforms computers from dumb machines that blindly follow instructions to technology that can learn and adapt to its surrounding environment. Machine learning is a foundational technology for the future of the computing sector. It is so pervasive that we are already using technologies that utilise a form of machine learning many times every day. In this module you will master contemporary machine learning skills and learn to apply a practical workflow to a variety of real-world problems using a range of machine learning algorithms to create adaptive and intelligent systems.

Sample assessment: Presentation and Report

COMP3409: Internet of Things

As the world becomes ever more connected due to huge growth in interconnected devices (smart devices, cars, washing machines, microwave oven, wearables, etc.), there will be a huge demand for graduates with knowledge and skills to compute these things. This module provides you with knowledge of the principles and concepts of IoT as a system for acquisition, communication and processing of data from a variety of sources. The module covers communication technologies and protocols for IoT, web application framework for IoT, monitoring and recording IoT device activities, visualising, processing and analysing data from IoT devices, current applications and technological trends, security and privacy for IoT. Practical exercises will lead students through the design and implementation of an end-to-end IoT system.

Sample assessment: 1: Design and Implement an IoT System 2: Demonstrate developed IoT system.

COMP3441: Advanced Web Application Development

This module is designed for students who wish to pursue advanced study in industry-relevant web application development. In response to the rapid uptake of dynamic content management systems, this module will look at how to tailor, enhance and adapt them to meet specific content and design strategy needs. Other related topics will include advanced use of scripting and query languages (eg. PHP, SQL, CSS, JavaScript, frameworks), investigating emerging web technologies, interacting with a range of external APIs, reviewing evolving practices in application development, and best practice in contemporary web design and professional standards.

Sample assessment: Written report and prototype and practical assessment

COMP3457: Managing Cyber Risk

This module introduces you to the processes and procedures involved in assessing and managing information risk. You will learn how to focus the process model of information systems (context diagrams, DFDs, etc. on the types of data involved and priority for extra protection. You will investigate current trends, techniques and industry standards; explore legal and technical issues related to image creation within the computing arena and gain practical skills with industry standard software.

Sample assessment: Practical assessment

COMP3471: Cyber Security

This module introduces you to the enhanced global infrastructure of the Internet, including PKI, https and digital certificates, for sending data securely through wired and wireless media. It covers topics such as packet switching and TCP/IP, client-server networking through the web, active directory, end-point security, firewalling, ethical hacking, The Computer Misuse Act, and information assurance.

Software used: CISCO Packet Tracer, Microsoft Hyper-V, ZAP vulnerability scanning software

Sample assessment: Report and Report/Presentation

COMP3491: Practical Database Applications

Collections of complex data accessed by multiple users have become increasingly prevalent in modern life. This module explores the issues of creating and maintaining complex shared databases via web-based applications. Emphasis will be placed on secure, efficient optimised database solutions.

Students will focus on the design and implementation of a working database using appropriate techniques and server-side scripting languages such as PHP with focus given to the integration of complex data types such as multimedia content (movies, images etc).

Sample assessment - Portfolio with Artefact & Class Tests