

BTEC Level 3 National Extended Certificate in Computing

(Equivalent to 1 A Level)

4 units in total delivered over 2 years – 2 assessed via examination, 2 assessed via coursework.

UNITS

Principles of Computer Science

Problem solving is an essential skill in all areas of life. To be successful, professionals need to be able to analyse the needs of individuals and organisations, and to evaluate the suitability and effectiveness of current ways of working in order to develop solutions that improve or enhance processes and/or outcomes.

In this unit, you will explore the logical and structured ways that computer systems process data to develop programs, processes and systems that solve specific problems. You will examine the features of effective computer programming and apply accepted computing and programming paradigms. You will analyse, develop and evaluate algorithms and computer code, and propose and apply solutions to ensure that computer systems are fit for purpose. In this unit, you will draw on your learning from across your programme to complete assessment tasks.

In this unit, you will develop the computational-thinking skills to effectively analyse a problem, break it down into its component parts, and design and evaluate solutions. These skills are required for progression to computing-related higher education courses or to the workplace as a computing professional.

This unit is assessed through a written examination.

Fundamentals of Computer Systems

Knowing how and why computer components, and the data they use, perform in certain ways has a significant impact on the work of all computing professionals. In technical support roles, understanding how different parts of a system integrate facilitates accurate identification of problems and efficient solutions. Professional programmers use their understanding of the way the computer operates to develop more efficient software solutions.

In this unit, you will explore the relationship between hardware and software as part of a computer system. You will examine the way computer components work both individually and together to store and process data, and the way in which data is transmitted and used in computer systems. You will explore the impact that computing systems have on organisations and individuals.

In this unit, you will apply the fundamental principles of computers to all areas of computing. This is essential for progression to a computing-related higher education course or for entry to the workplace as a computing professional.

This unit is assessed through a written examination.

IT Systems Security and Encryption

Our increasing reliance on computer systems makes us vulnerable to a range of attacks from cyber criminals. On a global scale, some conflicts reveal that IT systems are now a target. As IT system security defences become more robust, attack methods become more sophisticated. IT professionals require a good understanding of current security threats and of how to apply appropriate protection methods for any given situation. They also need to comply with legal requirements at all times.

In this unit, you will investigate the many different types of security attack, the vulnerabilities that exist and techniques that can be used to defend the IT systems of organisations. Many organisations run complex IT networks and need them to be secure while providing a safe environment for their employees to work, sharing some data and keeping other data private. You will learn about the complexities of configuring and supporting these networks.

You will also explore how encryption can be used to protect data. You will plan and apply suitable protection to an IT system and test it to ensure the protection is effective. You will configure an IT system's access control settings to control user access to various IT system resources, including files, folders and printers. Finally, you will review the protection that you have applied to an IT system and consider how effective it might be in defending the system from attack.

It is important that all IT professionals have a good understanding of security issues and how to defend IT systems against increasingly sophisticated attacks. This unit will prepare you for professional practice as well as entry to a higher education programme that contains elements of cyber security.

This unit is assessed through coursework.

Website Development

Increasingly, organisations rely on websites to serve customers and, in some cases, to generate revenue. With millions of web pages being created daily, the need for websites to be engaging, innovative and desirable is important. As a website developer, you must use sophisticated techniques to capture user interest and to ensure that customers are served. The scripting involved in the development of websites has become crucial: website developers need to understand and acquire the necessary skills to find solutions to a variety of scenarios and problems.

In this unit, you will review existing websites – commenting on their overall design and effectiveness. You will use scripting languages such as Hypertext Markup Language (HTML), Cascading Style Sheets (CSS) and JavaScript® and a simple text editor, or rapid application development tools. Finally, you will reflect on the website design and functionality using a testing and review process.

Many software developers, database experts and systems managers need web client development skills as an integral part of their overall portfolio of expertise. This unit will prepare you for employment as a website developer or a website development apprenticeship. The unit will benefit you if you want to go on to higher education to develop your studies.

This unit is assessed through coursework.

Teaching staff – Philip Gorman, Emma Roberts