VOCATIONAL SCHOOL
DOUBLE DIPLOMA PROGRAM "BTEC L5 HND"
COURSE DESCRIPTIONS OF
COMPUTING & SYSTEMS DEVELOPMENT PROGRAMME

BUSINESS SKILLS FOR E-COMMERCE

Aim

To enable learners to apply the business skills needed to design an e-Commerce solution for an organization.

Unit abstract

Organizations of all sizes, structures and aims can benefit from the opportunities made available by the intelligent application of communication based technologies and there will always be a need for practitioners who have a good understanding of those technologies. E-Commerce has become a vital part of an organization's ability to reach out to the marketplace and position itself to maximize commercial returns on investment. Poor choices of technology and processes will result in poorly managed opportunities which could lose business, market position and profitability. Learners will investigate the values of business skills by exploring current, topical examples of e-Commerce practices. Learners will consider how to design an e-Commerce solution to the best advantage of the organization and its stakeholders (for example employees, suppliers and customers). Learners will explore current legislation concerning e-Commerce based trading, organizational responsibilities and finance/payment systems. The first part of the unit considers the structure and aims of organizations to better understand how they could benefit from an e-Commerce structure. Then follows an opportunity to investigate and evaluate the impact of e-Commerce systems on organizations and their stakeholders. Once these areas have been studied the learner will be in a position to examine the process of the development of an e-Commerce presence followed by the opportunity to design an e-Commerce system.

COMPUTER SYSTEMS

Aim

To enable learners to understand computer systems and apply theoretical knowledge to practical application when building, configuring and maintaining computer systems.

Unit abstract

Most IT professionals will at some stage have to set up, use, customise and maintain computer systems. In order to do so effectively they will need to understand how computer systems work. Learners will understand the theoretical aspects of computer systems, and how information is processed. This unit explores the hardware, software and peripheral components that make up a computer system. There are many different manufacturers of computer systems and each manufacturer will produce a wide range of models with different specifications. Deciding which particular model is appropriate for a given situation depends on a variety of factors. Custom-built computer systems are also an advantage when meeting specialized requirements, whilst maintaining performance and keeping costs low. These aspects are explored in this unit so that learners can make informed choices when designing a computer system for a given purpose. Learners will be able to apply their theoretical knowledge to practical application by building, configuring and testing a functional computer system which will meet a given specification. Computer users also need the skills required to set up and carry out routine maintenance of computer systems. Although this unit does not extensively cover fault finding and repair, it includes the basic maintenance skills that would normally be expected of most computer users.

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COMPUTING & SYSTEMS DEVELOPMENT PROGRAMME

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EMPLOYABILITY AND PROFESSIONAL DEVELOPMENT

Aim

To provide learners with the opportunity to acquire employability skills required for effective employment and to manage their own personal and professional development.

Unit abstract

All learners at all levels of education and experience require employability skills as a prerequisite to entering the job market. This unit gives learners an opportunity to assess and develop an understanding of their own responsibilities and performance in or when entering the workplace. The unit considers the skills required for general employment such as interpersonal and transferable skills, and the dynamics of working with others in teams or groups including leadership and communication skills. It also deals with the everyday working requirement of problem solving which includes the identification or specification of the 'problem', strategies for its solution and then evaluation of the results of the solution through reflective practices.

PROJECT DESIGN IMPLEMENTATION AND EVALUATION

Aim

To develop learners' skills of Independent enquiry by undertaking a sustained Investigation of direct relevance to their vocational, academic and professional development.

Unit abstract

This unit provides opportunities to develop skills in decision making, problem solving and communication integrated with the skills and knowledge developed in many of the other units within the programme to complete a realistic project. It requires the learner to select, plan, implement and evaluate a project and finally present the outcomes, in terms of the process and the product of the project. It also allows learners to develop the ability to work individually and/or with others, within a defined timescale and given constraints, to produce an acceptable and viable solution to an agreed brief. If this is a group project, each member of the team must be clear about their responsibilities at the start of the project and supervisors must ensure that everyone is accountable for each aspect of the work and makes a contribution to the end result. Learners must work under the supervision of programme tutors or work-based managers.

HUMAN COMPUTER INTERACTION

Aim

This unit aims to give learners an understanding of recent Human Computer Interaction (HCI) developments and will enable them to develop a human computer interface.

Unit abstract

As technology moves forward, new methods of communicating with computer systems are becoming possible. Developers need to make reasoned choices as to the nature and appropriateness of the interface they are developing or using, in order to ensure that the user interaction is as natural, efficient and effective as possible. This requires a good understanding of the essentials of HCI and of the latest developments. A long-term goal of HCI is to design systems that minimize barriers between the human's cognitive model of what they want to do and the computer's understanding of the user's intent. Learners will be encouraged to explore the detail of how users interact with software, how the interface works to help fulfil the user needs and how it makes allowances for different users. Learners will develop a critical appreciation of the advantages and disadvantages of various interfaces currently available and develop an HCI using an appropriate programming language or software tool.

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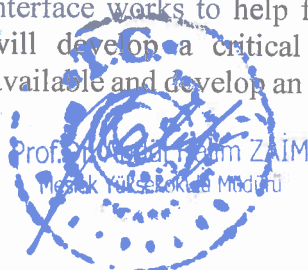
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DOUBLE DIPLOMA PROGRAM "BTEC L5 HND"
COURSE DESCRIPTIONS OF
COMPUTING & SYSTEMS DEVELOPMENT PROGRAMME

WEBSITE DESIGN
Aim
To enable learners to understand the concepts of website design and apply their own creativity in designing and developing interactive websites.
Unit abstract
The internet is perhaps the most important IT development of the last few decades; it provides new ways to communicate and share information. It has also revolutionized the way people and businesses use IT.
Businesses can now take part in a global marketplace, widening their scope for potential customers, all from a local base and with relatively low start-up costs. The need for good web designers and developers continues to grow as more and more companies realize they must develop a web presence and keep it maintained and updated. As web technologies develop, there is an increasing need for websites to be interactive. This allows two-way communication between the user and the website. The number of websites on the world wide web has increased dramatically and competition is very fierce. This means that designers must employ increasingly sophisticated techniques to capture interest, as well as ensuring that an appropriate company image is presented. Usability issues, such as navigation methods, must be considered carefully. A poorly-designed structure could result in users becoming confused or frustrated and navigating away from the website.
Learners will begin this unit by evaluating existing websites, in the context of cross-platforms, range of browsers, and design features. Designing websites, which are accessible to all types of users is a fundamental aspect of any website design. This unit also considers the whole process from identification of need, design, implementation, testing, maintenance and review. It is important that learners do not just develop skills in specific techniques but are also able to select when and where they are most appropriate, basing this decision on client and user needs. As with any field of IT, a comprehensive understanding of the relevant legislation and guidelines is always fundamental.

DATA STRUCTURES AND ALGORITHMS
Aim
This unit provides learners with an understanding of how data structures are used in algorithms and enables them to design and implement data structures.
Unit abstract
The unit starts by introducing abstract data types and explores their use in data structures. Based on this knowledge and understanding, learners should be able to develop solutions, using data structures for a range of commercial needs. Data structures may be implemented using a variety of programming paradigms and learners may use one or more areas for their implementations. Finally, learners will research commercial applications that incorporate data structures and evaluate their use.
On completion of this unit the learner should be able to design and implement a variety of data structures and be able to evaluate different algorithms that implement data structures.

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COURSE DESCRIPTIONS OF
COMPUTING & SYSTEMS DEVELOPMENT PROGRAMME

PROGRAMMING IN JAVA
Unit aim
To provide learners with an understanding of the principles of programming in Java, exploring the object oriented nature of the language and the multi-platform versatility offered.

Unit abstract
Object oriented programming is an industry-proven method for developing reliable modular programs and is popular in software engineering and systems development. Consistent use of object oriented techniques can lead to shorter development lifecycles, increased productivity, adaptable code, reuse of different technologies, the interaction of different systems using common platforms and therefore lower the cost of producing and maintaining systems. Java is synonymous with the object orient paradigm offering all the features of the technology in a format that can be used on many differing systems. The development of systems with Java objects simplifies the task of creating and maintaining complex applications. Many environments use Java as its 'underpinning' framework, with Java applications found on mobile phones, dedicated systems, web-based multimedia, security and control systems as well as traditional applications and bespoke operating systems.
Learners taking this unit will have the opportunity to develop their understanding of the Java programming language and develop code suited to a range of platforms. The unit is not specific to one instance of the Java programming language and may be used to deploy, among others, mobile applications, bespoke applications or web-based solutions.

COMPUTER SYSTEMS ARCHITECTURE
Aim and purpose
To enable learners to understand the underlying architecture and components behind the functioning of computer systems.

Unit abstract
All computer systems share the same underlying computer architecture principles. This unit examines these principles and explores the fundamentals of how computer systems work. Learners will focus on the technical detail including how the components function at an electronic level. Learners will explore how various types of data can be represented and then stored within computer systems. This is followed by a study of the low-level system components. It includes the processor, buses and memory incorporating an analysis of how these components interact to manipulate data using the fetch-execute cycle. Low-level program instructions make up the fetch-execute cycle and simple assembly code instructions are investigated along with their interaction with the various registers that make up the Central Processing Unit (CPU). Learners will have the opportunity to develop simple programs in a low-level language.

WEB SERVER SCRIPTING
Aim and purpose
To enable understand and use web server scripting and investigate the common issues surrounding its use.

Unit abstract
When designing and building websites, a key issue for developers is the amount of control they can exert over how tasks are carried out. Client-side scripting embedded in web pages can give additional functionality but, because the code is executed after the page has been loaded, there is little control and this approach can lead to hacking vulnerabilities and errors. Web server scripting is code written 'server-side' and executed before the page is loaded.

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COURSE DESCRIPTIONS OF
COMPUTING & SYSTEMS DEVELOPMENT PROGRAMME

This means that complex tasks can be created and programming is generally more secure. The skills and knowledge developed in this unit are particularly valuable because security and reliability are common issues for businesses. The types of operation that can be influenced include handling files on the server, security systems such as password protection, and accessing databases. Server scripting can be used, for example, to gather statistics about the website, including how many visitors have viewed each page. Data such as this can be used to generate revenue from people wishing to advertise on a popular website. Another function that web server scripting can relate to is the use of environmental arguments. The user's computer system is scanned to obtain their screen resolution, browser type and other information. Each web page in a website can be made several times to suit a variety of environments. The user is then automatically redirected to the page which best suits their environment. This facility can enhance user enjoyment but has ethical implications if used inappropriately. Learners will understand the principles of server-side web scripting and be able to create functionality using a web server script. Learners should also understand the security and ethical issues surrounding this area of IT.

DATABASE DESIGN CONCEPTS
Aim
To give learners opportunities to develop an understanding of the concepts and issues relating to databases and database design as well as the practical skills to translate that understanding into the design and creation of complex databases.
Unit abstract
Databases play an integral part in commercial domains, they provide users with a tool in which to store, model and retrieve data. Database development is fundamental in the area of computing and ICT within organizational contexts. Database Management Systems (DBMS) provide the systems, tools and interfaces by which the organization can manage their information and use it to assist in the effective running of the organization. Databases offer many links to other areas such as programming, systems analysis, HCI, as well as embracing issues of compatibility and end-user interfacing. This unit explores database architecture, DBMS and the use of databases in an organizational context. Database design techniques are investigated and successful learners will be able to apply theoretical understanding to design, create and document a database system.

E-COMMERCE STRATEGY
Aim
To enable learners to understand how businesses and organizations develop e-Commerce strategies to remain competitive in the global market.
Unit abstract
This unit starts by considering customers' expectations of e-Commerce, because these will dictate implementation priorities. When planning an e-Commerce strategy, it is necessary to assess the current status of the business information and logistics systems because these will provide the foundation for e-Commerce. Preparations will also be necessary to meet the standards of support that e-customers expect. Marketing, promotion and supply chain management must all be considered, alongside the website, when developing an implementation strategy. In managing an e-Commerce strategy, considerations include protecting the intellectual property of the business and maintaining the integrity of its website. This will require considerations of risk and the implementation of appropriate security precautions. Finally in this unit learners will critically evaluate current developments in e-Commerce.

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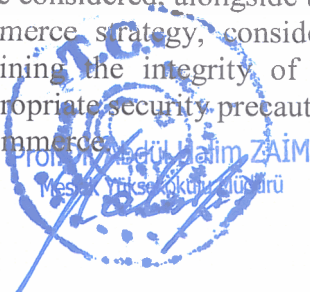
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DOUBLE DIPLOMA PROGRAM "BTEC L5 HND"
COURSE DESCRIPTIONS OF
COMPUTING & SYSTEMS DEVELOPMENT PROGRAMME

3D COMPUTER MODELLING AND ANIMATION

Aim

This unit aims to develop learners' skills and understanding of the principles and practical applications of 3D modelling and animation.

Unit abstract

The unit supports learners to visualize and design three-dimensional space and object forms that exist within it. An appreciation of the requirements and applications of computer modeling and animation in commercial contexts may be used to inform learners' development of personal animation work. Learners may also consider the technical requirements for producing and distributing digital animation effectively. Learners should gain a working knowledge of 3D computer modeling and animation software, through applying techniques in their own animation work. Research elements of the unit allow learners to review the work of 3D computer artists. Learners should develop creative responses to a set or self-generated brief, through exploring the potential offered by digital animation. Whilst the technical requirements of this field are demanding, learners should also be encouraged to reflect on creative approaches. Learners should work though stages such as visualization and identifying technical requirements for scenes and models. Animation is a dynamic process, and learners may need to explore alternative approaches to be able to realize their creative intentions.

WEB APPLICATIONS DEVELOPMENT

Aim

To enable learners to understand the concepts of web applications and apply the skills to develop and test web applications using server-side technologies.

Unit abstract

The internet has emerged as a dominating area of IT development. The ever-expanding applications within the global community that communicates, trades and exchanges information (seamlessly) has meant that the Internet and its associated technologies is a rapidly growing and changing area that requires in-depth knowledge as well as a wide range of skills. These web technologies have also been used to develop e-Commerce, intranet, extranet and social networking systems to meet the needs of modern businesses and associations. Learners should already be familiar with website design and management, and will be able to apply their own web development skills to this unit. Learners will enjoy extending their web-development skills by understanding the concepts of web-based applications using server-side technologies. This unit takes client-side web-development one step further by introducing server-side application development. This unit focuses on server-side technologies and how server-side scripting can be used to create sophisticated web-based applications. Learners will understand the concepts of web-based applications using one or more different server-side scripting languages, such as ASP, JSP and PHP. Many web-based systems also include database systems, which enables data to be processed dynamically. Learners will gain experience of developing web-enabled database systems, using SQL statements combined with server-side scripts to manage the process of information. Learners will develop skills in specific techniques and also able to select when and where they are most appropriate, basing this decision on client and user needs. They will also ensure that their applications comply with the relevant legislation and guidelines.

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COURSE DESCRIPTIONS OF
COMPUTING & SYSTEMS DEVELOPMENT PROGRAMME

IT VIRTUALIZATION

Aim

To provide learners with an understanding of the principles of virtualization and the deployment of virtual server and desktop environments as a commercial or personal technology option.

Unit abstract

As technology has evolved, the need to create virtual systems to simulate the behavior of a real environment has become a primary objective. In having a virtual environment, an information technology professional may use virtualization to plan a server deployment, test an application or operating system update, as well as test software created in a development environment. The power of virtualization has reached a stage where many commercial environments use virtualization to run seemingly live arrays of servers to ensure redundancy, reliably, security and a lower cost of hardware ownership. It has become possible with the development of server virtualization environments to have one hardware platform deliver many servers or remote workstations. There are many hardware and software virtualization solutions offered by different vendors. This unit allows the learner to access either desktop based virtualization or server-based virtualization, or possibly both. In delivery, there are many free to education as well as commercially available offerings. Creating a virtualization environment will require an understanding of the host system and its limitations as well as the requirements of the guest operating system. This unit will encourage the learner to explore how this may be accomplished and implement a viable system for commercial or personal use.

QUALITY SYSTEMS IN IT

Aim

To provide learners with an understanding of the importance of the quality process as applied to IT-related systems development.

Unit abstract

Quality control and assurance relies on the establishment of standards by which projects can be measured. This is carried out through reviews, tests and inspections to ensure that the end product meets requirements. IT projects need to be carried out within a structured framework of procedures that will ensure that quality is an integral part of the development process. Adherence to this framework ensures that the final outcome meets its intended purpose and has been produced using the most efficient method. Learners will begin this unit by exploring the meaning of quality in the context of IT development and the implications of adopting this approach. They will continue by learning about the quality control issues and then project management tools that can be used to support the process. On completion of this unit, learners will understand the importance of a quality-focused approach to development and maintenance and be able to select appropriate tools to enable this.

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DOUBLE DIPLOMA PROGRAM "BTEC L5 HND"
COURSE DESCRIPTIONS OF
COMPUTING & SYSTEMS DEVELOPMENT PROGRAMME

NETWORK SECURITY

Aim

To provide learners with opportunities to manage, support and implement a secure network infrastructure for a commercial LAN or WAN environment.

Unit abstract

ICT professionals managing a complex network infrastructure for a large corporate entity, as well as individuals maintaining small systems or personal access, all have to contemplate and implement a variety of network security intrusion prevention and detection methods. Attacks evolve and threats change as systems increase in speed, capacity and use and as technologies change. The network security expert needs to ensure their skills remain current and maintain an understanding of the technological issues along with the social and commercial impact. This unit explores the social impact of network security, and by designing network security solution learners will understand the importance of enabling the IT user to remain safe whilst being able to use the system without unreasonable restrictions. Learners will research, design and implement secure environments protecting IT systems and therefore individuals from attack. The protection will include intrusion detection and prevention, user and resource access management and the maintenance of malware defense. Learners will implement a proposed networked security solution, and manage the implemented solution.

LOCAL AREA NETWORKING TECHNOLOGIES

Aim

To provide learners with an understanding of Local Area Network (LAN) technologies and the delivery of a wide range of networked services across a LAN infrastructure.

Unit abstract

LANs have become ubiquitous in all but the smallest of enterprises and their Implementation has become the realm of skilled designers if the best advantage is to be made of available technology. Whist it is now the case that simple networks can often been installed by users with little previous knowledge, the design, implementation, testing and management of extended LANs requires considerable technical knowledge.

The impact of LANs across an organization can require upskilling of staff, changes to the physical environment and changes to commercial procedures. It also requires changes to the access, security and ownership of the data which passes across the LAN. In this unit learners will understand that consideration must be given to not only the physical LAN but the organizational culture as a whole. Learners will understand the importance of considering both physical and logical environments including network addressing, best use of media, and network segmentation. Learners will also study Quality of Service (QoS) in order to best manage the network traffic. Once a LAN is installed and operational learners will study methods of measuring and maintaining performance in a proactive manner using a range of tools.

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