MQF/EQF Level 6

IT6-A1-21

Bachelor of Science (Honours) in Computer Systems and Networks

Course Specification

Course Description

Computer systems and networks are a growth area in today's business environment due to the fact that there is a strong demand for highly skilled technical persons who can devise original solutions for complex problems in the context of IT and network implementation using modern techniques. This hands-on degree programme is intended for learners who wish to pursue a career in the world of computer systems and networks. In this course learners will be exposed to enterprise network technologies, data centre operations, service provider networks, information security, virtualisation, DevOps and cloud computing technologies. Due importance will also be given to emerging technologies which learners will find being implemented when they start working within the industry. A hands-on practical approach is adopted throughout the course.

This course does not entitle the successful candidates to apply for an engineering warrant with the Engineering Profession Board of Malta on successful completion of the course.

Programme Learning Outcomes

At the end of the programme the learner will be able to:

1. *Understand key technologies and protocols used in enterprise systems and networks;*
2. *Design enterprise computer systems and networks according to a given specification;*
3. *Implement enterprise computer systems and networks according to a given specification;*
4. *Evaluate current and emerging network technologies.*

Entry Requirements

MCAST Advanced Diploma in IT
Recommended stream: Computer Systems and Networks
OR
MCAST Advanced Diploma in Electronics (Computer Engineering)
OR
2 A-Level passes and 2 I-Level passes
Compulsory A-Level: Computing
AND
Compulsory A-Level or I-Level: Mathematics (Pure or Applied) or Physics

Key Information

Awarding Body – MCAST

Accreditation Status – Accredited via MCAST's Self Accreditation Process (MCAST holds Self-Accrediting Status as per 1st schedule of Legal Notice 296/2012)

Type of Programme: Qualification

MQF Level	Examples of Qualifications	'Qualification' Minimum Credits Required	'Award' Credits Required
Level 8	Doctoral Degree Third Cycle Bologna Process	NA	NA
Level 7	Masters Second Cycle Bologna Process	90-120	Less than 30
	Post-Graduate Diploma	60	
	Post-Graduate Certificate	30	
Level 6	Bachelor[23]/Bachelor (Hons.)[24] First Cycle Bologna Process	180-240	Less than 180
Level 5	Short Cycle Qualification	120	Less than 60
	Undergraduate Higher Diploma	90	
	Undergraduate Diploma	60	
	Undergraduate Certificate	30	
	VET Level 5 Programme[25]	60-120	
Level 4	Pre-Tertiary Certificate	30	Less than 120
	VET Level 4 Programme[26]	120	
	MATSEC Certificate	NA	
Level 3	VET Level 3 Programme[27]	60	Less than 60
	General and Subject Certificate	NA	
Level 2	VET Level 2 Programme[28]	60	Less than 60
	General and Subject Certificate	NA	
Level 1	VET Level 1 Programme[29]	40	Less than 40
	General and Subject Certificate	NA	
Introductory Level A	Preparatory Programme	30	Less than 30
Introductory Level B	Pre-entry Basic Skills Course	30	Less than 30

Table 1: Minimum number of credits for 'Qualifications' and parameters for 'Awards'

Fig.1: p56, Ministry for Education and Employment & National Commission for Further and Higher Education Malta (2016). *Referencing Report, 4th Edition*. NCFHE.

Total number of Hours: 4500 hours

Mode of attendance: Fully Face-to-Face Learning

Duration: 3 Years

Target audience for MCAST full-time courses is 16 to 65+

The official language of instruction at MCAST is English. All notes and textbooks are in English (except for language courses, which will be in the respective language being instructed). International candidates will be requested to meet English language certification requirements for access to the course.

This course will be offered at

MCAST has four campuses as follows:

MCAST Main Campus
Triq Kordin, Paola, Malta

All courses except for the Institute for the Creative Arts, Centre of Agriculture, Aquatics and Animal Sciences are offered here.

Institute for the Creative Arts
Mosta Campus
Misraħ Għonoq Tarġa Gap,
Mosta

Institute of Applied Sciences,
Centre of Agriculture, Aquatics and Animal Sciences,
Luqa Road, Qormi

Gozo Campus
J.F. De Chambray Street
MCAST, Għajnsielem
Gozo

Teaching, Learning and Assessment

The programmes offered are vocational in nature and entail both theoretical lectures delivered in classes as well as practical elements that are delivered in laboratories, workshops, salons, simulators as the module requirements dictate.

Each module or unit entails a number of in person and/or online contact learning hours that are delivered by the lecturer or tutor directly (See also section 'Total Learning Hours).

Access to all resources is provided to all registered students. These include study resources in paper or electronic format through the Library and Resource Centre as well as tools, software, equipment and machinery that are provided by the respective institutes depending on the requirements of the course or module.

Students may however be required to provide consumable material for use during practical sessions and projects unless these are explicitly provided by the College.

All Units of study are assessed throughout the academic year through continuous assessment using a variety of assessment tools. Coursework tasks are exclusively based on the Learning Outcomes and Grading Criteria as prescribed in the course specification. The Learning Outcomes and Grading Criteria are communicated to the Student via the coursework documentation.

The method of assessment shall reflect the Level, credit points (ECTS) and the schedule of time-tabled/non-timetabled hours of learning of each study unit. A variety of assessment instruments, not solely Time Constrained Assignments/Exams, are used to gather and interpret evidence of Student competence toward pre-established grading criteria that are aligned to the learning outcomes of each unit of the programme of study.

Grading criteria are assessed through a number of tasks, each task being assigned a number of marks. The number of grading criteria is included in the respective Programme Specification.

The distribution of marks and assessment mode depends on the nature and objectives of the unit in question.

Coursework shall normally be completed during the semester in which the Unit is delivered.

Time-constrained assignments may be held between 8 am and 8 pm during the delivery period of a Unit, or at the end of the semester in which the Unit is completed. The dates are notified and published on the Institute notice boards or through other means of communication.

Certain circumstances (such as but not limited to the Covid 19 pandemic) may lead Institutes and Centres to hold teaching and assessment remotely (online) as per MCAST QA Policy and Standard for Online Teaching, Learning and Assessment (Doc 020) available via link https://www.mcast.edu.mt/college-documents/

The Programme Regulations referenced below apply. (DOC 005 available at: link https://www.mcast.edu.mt/college-documents/)

Total Learning Hours

The total learning hours required for each unit or module are determined as follows:

Credits (ECTS)	Indicative contact hours	Total Student workload (hrs)	Self-Learning and Assessment Hours
1	5 – 10 hrs	25 hrs	20-15 hrs*
2	10 – 20 hrs	50 hrs	40-30 hrs*
3	15 – 30 hrs	75 hrs	60-45 hrs*
4	20 – 40 hrs	100 hrs	80-60 hrs*
6	30 – 60 hrs	150 Hrs	120-90 hrs*
9	45 – 90 hrs	225 hrs	180-135 hrs*
12	60 – 120 hrs	300 hrs	240-180 hrs*

* The 'Self-Learning and Assessment Hours' amount to the difference between the contact hours and total student workload.

Grading system

All MCAST programmes adopt a learner centred approach through the focus on Learning Outcomes. The assessment of MCAST programmes is criterion-referenced and thus

assessors are required to assess learners' evidence against a pre-determined set of Learning Outcomes and assessment criteria.

For a student to be deemed to have successfully passed a unit, a minimum of 50% (grade D) must be achieved. In case of part time programmes, the student must achieve a minimum of 45% to successfully pass the unit.

All units are individually graded as follows:
A* (90-100)
A (80-89)
B (70-79)
C (60-69)
D (50-59)
Unsatisfactory work is graded as 'U'.

Work-based learning units are graded on a Pass/Fail basis only.

Detailed information regarding the grading system may be found in the following document: DOC 005 available at: link https://www.mcast.edu.mt/college-documents/

Intake Dates

•MCAST opens calls for application once a year between July and August of each year for prospective applicants residing in MALTA.
•Applications to full-time courses from international students not residing in MALTA are accepted between April and Mid-August.
•For exact dates re calls for applications please follow this link https://www.mcast.edu.mt/online-applications-2/

Course Fees

MCAST course are free for Maltese and EU candidates. International candidates coming from outside the EU need to pay fees for the respective course. Course fees are set on a per-level and course duration basis. For access to course fee structure and payment methods please visit https://www.mcast.edu.mt/fee-payments-for-non-eu-candidates/.

Method of Application

Applications to full-time courses are received online via the College Management Information System. Candidates can log in using Maltese Electronic ID (eID) or European eIDAS (electronic identification and trust services) to access the system directly and create an account as the identity is verified electronically via these secure services.

Non-EU candidates need to request account creation though an online form by providing proof of identification and basic data. Once the identity is verified and the account is created the candidate may proceed with the online application according to the same instructions applicable to all other candidates.

Non-EU candidates require a study visa in order to travel to Malta and joint the course applied for. For further information re study-visa please access https://www.identitymalta.com/unit/central-visa-unit/.

For access to instructions on how to apply online please visit https://www.mcast.edu.mt/online-applications-2/

Contact details for requesting further information about future learning opportunities:

MCAST Career Guidance
Tel: 2398 7135/6
Email: career.guidance@mcast.edu.mt

Current Approved Programme Structure

Unit Code	Unit Title	ECTS	Year	Semester
ITDBS-506-1801	Database Administration	6	1	A
ITNET-506-1602	Networking Concepts	6	1	A
ITSYS-506-1604	Computer Platforms	6	1	A
ITNET-506-2006	Linux Fundamentals	6	1	A
CDKSK-503-1907	English I	3	1	A
ITSTY-506-1601	Security Fundamentals	6	1	B
ITSYS-512-2006	Server Administration	12	1	B
ITNET-506-2007	LAN Switching	6	1	B
ITNET-506-2008	Digital Forensics	6	1	B
CDKSK-503-1908	English II	3	1	B
ITNET-506-1804	Scripting for Networking	6	2	A
ITNET-506-2005	Virtualisation	6	2	A
ITNET-506-1607	Maths for Computer Networking	6	2	A
ITNET-506-1806	Network Security	6	2	A
ITNET-506-1807	Advanced Routing 1	6	2	A
ITNET-506-1809	Advanced Routing 2	6	2	B
ITNET-506-2009	Linux Server Administration	6	2	B
ITRSH-506-2101	Research Design 1	6	2	B
CDKSK-604-1909	Entrepreneurship	4	2	B
CDKSK-602-2105	Community Social Responsibility	2	2	B
CDWBL-506-1901	Work Based Learning I	6	2	B
ITNET-606-1610	Multimedia Networks	6	3	A
ITNET-606-1611	Software Defined Networks	6	3	A
ITDVP-606-2101	Devops	6	3	A
ITNET-606-1613	Wide Area Networks II	6	3	A
ITNET-606-2010	Wireless Networks	6	3	B
ITNET-606-1614	Cloud Infrastructure	6	3	B
ITRSH-606-2102	Research Design 2	6	3	B
CDWBL-506-1902	Work Based Learning II	6	3	B
ITDIS-612-1601	Dissertation	12	3	B
Total ECTS		**180**	**/**	**/**

ITDBS-506-1801: Database Administration

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

A database is a collection of information stored in a structured way for convenient access by applications or data-processing systems. Databases play a key role in most organizations today. In fact, every organization, in some way shape or form, uses a database. Companies within the retail sector, the medical sector and the Government sector are all popular users of large-scale databases. Because databases often hold business critical data belonging to the organization, its employees or customers, they can grow into complex, mission critical systems. For them to perform well on a consistent basis they must be managed and maintained properly using a database management system (DBMS).

The role of a database administrator - the person responsible for the performance, integrity and security of the database and its related infrastructure – becomes a critical piece of the puzzle. The database administrator, or DBA, supports the wider areas of the business by managing and maintaining the database system, handling capacity planning, disaster recovery planning and ensuring availability and reliability. The DBA can also be responsible for the retrieval of data from the database using the Structured Query Language (SQL).

Individuals studying this unit will learn the skills required to implement, manage and support a variety of database management systems (DBMS). This unit is built on the notion that, while databases are essentially practical things, their successful creation and implementation depends on understanding the important theoretical concepts that define them.

Learners will build and draw upon technical, analytical, and problem-solving skills in all areas of database administration. Through theory and practice, students will learn about the fundamental concepts, tools and techniques required to perform the role of a database administrator.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Plan and install a DBMS solution.*
2. *Manage DBMS security and permissions.*
3. *Retrieve data efficiently from a relation database.*
4. *Ensure data consistency and availability.*

ITNET-506-1602: Networking Concepts

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

Computer networks are vital in different areas of our lives. This aim of this unit is to reinforce the basic concepts that enable data communication over computer networks. Students will be introduced to the theoretical foundations of data transmission along with an in-depth coverage and application of the OSI & TCP/IP models.

Practical exercises will be presented to provide a practical perspective to the theory presented. A number of core networking protocols will be discussed and analysed using a protocol analyser. Students will also be introduced to copper and fibre structured cabling design, installation, testing and certification. Emerging technologies such as IPv6 are also an essential part of this unit.

The unit shall assist the learner in preparing himself/herself for professional/vendor certifications.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Show understanding of the basic concepts behind data transmission technology.*
2. *Understand and apply networking models and protocols.*
3. *Show understanding of the operation of various network components.*
4. *Design, configure, test and troubleshoot a network.*

ITSYS-506-1604: Computer Platforms

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

This course introduces the foundations of data representations, combinational logic design using HDL and computer systems.

This module provides an understanding of computer number representations and basic arithmetic algorithms. These are further developed to cover the design of arithmetic unit and combination logic design using a HDL. Computer architecture together with memory management and I/O systems are also covered within this module.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Manipulate and explain the use of number and logic systems in a computer.*
2. *Design a combinational logic circuit.*
3. *Simulate a combinational logic circuit.*
4. *Understand and design the basic computer architecture.*

ITNET-506-2006: Linux Fundamentals

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

This unit introduces students to the Linux environment. It has been designed for students that have little or no knowledge of Linux and is based on the LPIC-1 certification.

The Linux operating system has been on the market from the early 90's and finds its roots in the Unix operating system created in the 70's. Its stability, power and security features make it one of the most popular operating systems used today. Linux is the main OS used today for web servers and embedded systems such as mobile phones and IoT devices, making the unit relevant to today's technological scenario. The unit serves as a basis to acquire the skills required for future units in the programme which are based on the Linux environment.

The learner will be introduced to the basics of using the Linux shell and will then move on to more advanced skills such as managing groups and users, processes, file and package management. The unit will also challenge the student to explore the use of basic scripting techniques to automate repetitive administrative tasks.

The new concepts are introduced to the students through a hands-on practical approach with a number several scenarios related to industry.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Understand the structure of a Linux file system.*
2. *Use the command line to process text streams.*
3. *Perform system administration tasks using shell commands.*
4. *Implement basic shell scripts.*

ITSTY-506-1601: Security Fundamentals

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

This unit is designed to introduce candidates to the issues involved in designing and constructing secure computer networks. An organisation must consider security to protect its network from damage and information theft.

Security is an essential part of an IT system. As security attacks become more sophisticated, the level of skill required to perform the simplest of attacks is decreasing. Several tools which enable users with basic security skills to launch attacks are become widely available.

This course will focus on network security concerns related to hardware, software, network and physical access. Industry standard best practises will also be explored. Knowledge of threats and attacks is important in order to appreciate the potential consequences to an organization and implement defence mechanisms

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Demonstrate network security, compliance and operational security.*
2. *Identify and describe threats and vulnerabilities.*
3. *Implement basic application, data and host security.*
4. *Identify suitable methods of cryptography.*

ITSYS-512-2006: Server Administration

Unit Level (MQF/EQF): 5

Credits: 12

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 300

Unit Description

According to Info Tech Research Group, the job of server administrator is to, "Install, administer, and optimize company servers and related components to achieve high performance of the various business applications supported by tuning the servers as necessary. This includes ensuring the availability of client/server applications, configuring all new implementations, and developing processes and procedures for ongoing management of the server environment. Where applicable, the Server Administrator will assist in overseeing the physical security, integrity, and safety of the data centre/server farm.

The purpose of this unit is to address the skillset required by providing learners with the basic knowledge and understanding of the server operating systems and the services and features offered by them, and to enable learners to acquire the practical skills required to configure and maintain these devices.

The unit delivers the knowledge and skills required to deploy, configure and maintain a contemporary server oprating system. In addition to studying the theoretical aspects of network server operating systems such as designing a network directory infrastructure, the unit involves a significant element of hands-on lab-oriented activities using industry standard software.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Plan and implement infrastructure services.*
2. *Plan and deploy application services.*
3. *Plan and implement server and network security.*
4. *Manage and monitor services.*

ITNET-506-2007: LAN Switching

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

The purpose of this unit is to provide learners with the basic knowledge and understanding of the switching technologies underlying contemporary LAN network infrastructures and to enable them to acquire practical skills in the configuration and maintenance of these devices.

Computer Networking technologies have grown in complexity to meet the need of modern Business solutions. This unit presents learners with the business drivers for and the underlying technologies to support integrated voice and data capabilities in a secure network environment.

In addition to studying the theoretical aspects of protocols, the unit involves a significant element of hands-on lab-oriented activities and simulation package exercises using industry standard equipment.

The course can be delivered through a 'blended learning approach' where tutor led teaching is combined with media rich online learning resources.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Describe Ethernet technology and Switching concepts.*
2. *Show proficiency in switch configuration and troubleshooting.*
3. *Understand concepts of and implement VLANs.*
4. *Understand switching technologies providing redundancy and availability.*

ITNET-506-2008: Digital Forensics

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

Digital forensics involves the investigation of computer-related crimes with the goal of obtaining evidence to be presented in a court of law. With the proliferation of computers in our everyday lives, the need to include computer contents or traces as part of formal evidence has become inevitable. Digital devices are everywhere and, in many forms, starting with the traditional desktop computers, handheld communication devices and even storage devices. Devices such as memory cards, digital wearables, drones and video gaming consoles, are among a myriad of devices that can accept input, provide output, and also store data. It is this data or the usage of these devices that is at the centre of digital forensics.

Marcella A and Menendez D (2008), present a working definition of computer forensics as "the science of locating, extracting, and analysing types of data from different devices, which specialists then interpret to server as legal evidence". They further state that computer forensics can also be defined as —the discipline that combines elements of law and computer science to collect and analyse data from computer systems, networks, wireless communications, and storage devices in a way that is admissible as evidence in a court of law.

Computer forensics aim to attain as much information from electronic devices or media by utilizing sound forensic techniques that may be admissible in court. This includes concise and sound forensic techniques including a clear chain of custody and documentation. There are two different areas that must be considered when collecting digital forensic evidence. The first is the process of collecting the evidence without altering its contents and ensuring it is admissible in court. The second area is the actual use of law enforcement grade sound forensic practices that results in the collection being admissible in court. It is not the intent of this unit to address the latter. This unit's scope is to provide a concise coverage of the process of collecting forensic evidence from different sources such as but not limited to: computers, mobiles, networks and external storage devices and also review different methods, tools, and challenges during forensic analysis and collection.

Using both a theoretical and practical approach, in this course, the learner will:

- learn the principles and techniques for digital forensics investigation and the spectrum of available computer forensics tools.

- Learn about core forensics procedures to ensure court admissibility of evidence, as well as the legal and ethical implications.
- how to perform a forensic investigation on both Unix/Linux and Windows systems with different file systems.
- learn how to conduct forensic procedures
- review and analyse forensics reports.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Apply fundamental computer forensic concepts and procedures.*
2. *Apply digital forensic tools to discover, collect, preserve and analyse Windows Linux/Unix digital evidence, a network and handheld devices.*
3. *Recover hidden data for forensic analysis from Windows and Linux/Unix file systems.*
4. *Use steganography tools to detect and possibly recover hidden information.*
5. *Document and report effectively digital evidence findings to a court of law in such a way that it is also understandable to both expert and lay audiences.*

ITNET-506-1804: Scripting for Networking

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

This unit introduces students to the concepts of scripting in relation to networking. It has been designed for students that have a basic knowledge of scripting but require further training and insight in applying this knowledge to the field of networking.

In the past few years the field of networking has evolved and new technologies such as SDN's, cloud services and containers have emerged creating a demand on the market for persons with networking knowledge that are able to design and automate tasks in this field. Jobs such as DevOps Engineers, Network Stack Engineers and Cloud Platform Engineers require persons with a thorough knowledge of networking and the skill to apply this knowledge in order to automate tasks through scripting.

The learner will first be introduced to the basic concepts of program design in order to be able to create algorithms for solving common networking problems. The unit will then delve into the programming structures of a scripting language that is commonly used for networking such as Python. The basic structures of sequence, selection and repetition together with more advanced techniques such as arrays, files, modules and socket programming will be covered. Students will also have the opportunity to use a scripting language for designing network protocols, interacting with network services and managing devices.

Concepts are introduced to the students through a hands-on practical approach with several example scenarios related to industry.
The unit will provide students with scripting skills that can be used in other networking modules and for dissertation and research purposes

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Design a program algorithm.*
2. *Implement basic algorithms through a scripting language.*
3. *Demonstrate the use of advanced scripting language programming structures.*
4. *Use a scripting language to solve networking problems.*

ITNET-506-2005: Virtualisation

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

In a world where organisations strive to make better use of their resources, virtualization technologies have found their place within all corporate environments. Through virtualization technologies, one can eliminate the one to one mapping between an OS instance and a physical machine.

Throughout this unit, learners are introduced to the building blocks of virtualization technologies. The importance of high-availability is also stressed.

The specification of this unit is vendor neutral. Practical exercises can be carried out using products from any of the leading virtualization platform providers.

The assessment process focuses significantly on being able to apply the content covered in class to a practical business scenario with specific requirements and constraints.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Understand core virtualization concepts.*
2. *Deploy highly available virtual machines.*
3. *Design, implement and troubleshoot virtual networks.*
4. *Design, implement and troubleshoot shared storage.*

ITNET-506-1607: Maths for Computer Networking

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

This unit provides a framework for students to develop their mathematical skills in solving problems related to Computer Networks. Students will develop in-depth knowledge of terms that are frequently used and this will equip them with the right mathematical knowledge and skills needed for success on the job.

The unit focuses on the successful achievement of engineering-based core competences and key skills such as understanding the mathematical relation in signal degradation and regeneration, polynomial applications to error detection and correction, applying Shannon's Law amongst others. Students will evaluate and apply different techniques/laws to various real life scenarios and provide the most cost effective solution to the given problem. Moreover students will be able to present results using appropriate tools and finally communicate the conclusions effectively.

On successful completion of the unit students will be able to evaluate, reflect and re-examine their computer network design following a mathematical thinking process. This will help them to further their future studies and potentially improve their work employability prospects.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Apply algebraic concepts to engineering equations.*
2. *Understand core mathematical skills for network engineers.*
3. *Understand signal processing applications.*
4. *Apply statistical techniques to analyse data.*

ITNET-506-1806: Network Security

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

It has become exceedingly clear over the recent years that networks that are connected to the Internet are constantly at risk of attack. Many are familiar with multiple cases of cyberattacks which have led to severe consequences for businesses and organisations. This course aims to equip the student to face the challenge of securing a network effectively.

The task at hand depends on how well an individual understands the perils that exist. It is also necessary to have a solid understanding of the tools that are to be used.
The course includes a brief reference to the risk assessment process. It covers the role of cryptography in providing the essential security services, its application in message authentication and user authentication protocols and the establishment of secure channels, such as TLS, SSH and IPSec. It also comprises aspects of network security provided by VPNs, firewalls, intrusion detection (and prevention) systems and honeypots.

The course explores the multiple form of attacks that threaten the confidentiality, integrity and availability of systems and data. It also provides students with the skills required to assess vulnerabilities that put an organisation's networks and subsequently its data at risk. Students will carry out security assessment tasks, using tools such as nmap and metasploit.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Identify the ways in which cryptography is applied in network security.*
2. *Apply knowledge of secure communication channels and other network security technologies.*
3. *Identify the threat landscape and related security assessment methods.*
4. *Implement tasks related to the security assessment process.*

ITNET-506-1807: Advanced Routing 1

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

The purpose of this unit is to provide learners with basic knowledge and understanding of routing technologies underlying contemporary network infrastructures and to enable them to acquire practical skills in the configuration and maintenance of these devices.

Most of the unit deliverables are in-line with Cisco Certified Network Associate (CCNA) Routing and Switching certification, whilst constantly being updated in accordance to advancements of modern technologies.

In addition to studying the theoretical aspects of contemporary routing protocols such as EIGRP and OSPF, the unit involves a significant element of hands-on lab-oriented activities with simulation package exercises supported by industry standard equipment.
Topics such as NAT/PAT are also coupled together with VLSM in order to conserve IP addresses. The requirement to restrict network access to resources is also achieved through ACLs, which are explained and demonstrated via hands-on experience to simulate real life setups.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Understand the basic fundamentals of routing.*
2. *Implement and configure EIGRP.*
3. *Implement and configure OSPF.*
4. *Apply security best practices by implementing and configuring Access Control Lists.*
5. *Implement and configure NAT/PAT and DHCP.*

ITNET-506-1809: Advanced Routing 2

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

The purpose of this unit is to provide further insight about complex implementations of routing techniques, relying heavily on skills and competencies which should have been attained on completion of the previous unit, “Advanced Routing Part I”.

Most of the learning content has been developed in accordance to a number of deliverables as outlined in the Cisco Certified Network Professional Routing module CCNP 300-101. This is the latest version so far, featuring the most advanced routing techniques and configurations which are currently implemented in the IT industry.

The topics which are comprised in this unit mainly include in-depth knowledge and implementation of multi-area OSPF with all it’s strengths and features to provide optimal routing decisions in large enterprise networks, total control over routing updates which are sent and received as a result of network advertisements by dynamic routing protocols, application of various techniques used to prevent suboptimal routing, ability to forward traffic to destination networks depending from where traffic is being originated, and last but not least the application of one of the most popular tunnelling protocols “GRE” typically used to logically connect endpoints that reside in different autonomous systems, which finally leads to where BGP plays its role.

All mentioned deliverables shall be fulfilled by making use of a number of virtualisation technologies which closely resemble real-life setups.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Implement and configure multi-area OSPF at an advanced level.*
2. *Implement and configure routing manipulation techniques.*
3. *Apply source-based routing for path control.*
4. *Implement and configure BGP and GRE Tunnelling solutions.*

ITNET-506-2009: Linux Server Administration

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

The purpose of this unit is to cover the skills required to perform system administration tasks on a Linux Server. The unit assumes that learners are already familiar with basic Linux Server administration tasks such as creating files and folders, manipulating and editing files, changing file permissions, creating users and groups and managing processes using a Linux shell such as sh or bash.

This unit covers the deployment, configuration, and management of the most widely used services that a learner will encounter in a Linux Server environment. The unit is based on the exam objectives set by the Linux Professional Institute for the certifications of LPIC-1 and LPIC-2. It is up to the lecturer to decide which Linux Server distribution to use to cover the learning outcomes of this unit. Typical Linux distributions used in industry include Ubuntu Server, Red Hat Enterprise, SUSE Linux Server, or CentOS.

The unit will start by covering the basic tasks of installing and managing a Linux Server and will then move to more advanced features such as web services and network directory infrastructures. Most of the theoretical aspects of the services covered in this unit have already been covered at Level 5 and the unit is designed to have a significant element of hands-on lab-oriented activities.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Plan and deploy a Linux Server.*
2. *Deploy, manage, and monitor essential system services.*
3. *Implement secure network services.*
4. *Setup system security in Linux.*

ITRSH-506-2101: Research Design 1

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

The purpose of this unit is to give the learner the necessary skills to start researching in an area of personal interest yet also of relevance to the area of studies and to the benefit of the local/regional community. This module differentiates itself from the rest in the manner that the criteria focus on how research is to be performed, whilst it is the learner who will determine the subject area and tools to be utilized to build the prototype necessary.

Therefore, this unit requires the learner to identity a theme such as the study of beach deterioration in local beaches, then through guidance, determine the sources of data (Satellite imagery) and tools needed to conduct such research. Every other learner will focus on areas that are either of personal interest, subject areas communicated by other researchers (potential future mentors), topics of funded projects, or recommendations by various parties such as key external partners. This unit will give a structure to how research is conducted in a scientific manner, following industry standards and common practice.

The fundamental objective of this unit is to introduce the learner to hypothesis testing. Therefore, after a theme is selected, a hypothesis needs to be formulated together with research questions. A research pipeline highlighting the methods to be used in order to address the research questions follows. A preliminary literature review will be undertaken by the researcher in order to familiarize themselves with the current state of the art and to justify key decisions made in their individual research.
The learner is expected to work on a proof-of-concept, prototype or working solution in order to gather the necessary data from research experiments so to be able to argue and answer the set research questions. Upon analysis and reflection, the learner should be in a position to understand what a scientific research process is, what is expected of him/her from a dissertation.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Formulate a research hypothesis and research methodology.*
2. *Evaluate, after research, the current state of the art.*
3. *Evaluate project outcomes critically.*
4. *Report project outcomes and recommendations within a structured framework.*

CDWBL-506-1901: Work Based Learning I

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

The aim of this unit is to provide learners reading a degree at MCAST with the opportunity for work-based learning (WBL) with a registered MCAST partner. WBL provides learners with real-life work experiences where they can apply academic and technical skills and develop their employability. Work-based learning deliberately merges theory with practice and acknowledges the intersection of explicit and tacit forms of knowing.

Learners will be doing this unit in the summer of their first year and they will have a follow up unit in the summer of their second year so as to provide them with experience as their knowledge of the subject increases. This will enable them to develop holistically in the area they have chosen enabling them to enter the world of work fully prepared and with experience to show in the sector they have chosen. This unit will assist learners in preparing themselves to take responsibility for their own learning in the workplace and to develop the necessary confidence and attitudes to carry out tasks responsibly in real life work situations. Learners are able to gain practical, hands on experience in their chosen field of study whilst producing a work based learning portfolio and journal demonstrating their achievements and learning experiences.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Evaluate the relationship between theory, college practice and their application and development in a real world work-based activity.*
2. *Evaluate critically own performance and learning experiences at the place of work through a reflective journal.*
3. *Set SMART objectives for own improvement following the reflective exercise.*
4. *Develop an action plan for personal and professional development to reach set objectives.*

ITNET-606-2010: Wireless Networks

Unit Level (MQF/EQF): 6

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

This unit introduces learners to the modern technology involved with commercial wireless networks.

In today's industry, the flexibility of wireless technologies is essential. This unit will enhance the learners' knowledge, skills and confidence to design, configure implement and support wireless Local Area Networks in a small to medium sized business.

The unit will introduce the characteristics of a Wireless Local Area Network and also various technologies developed to enhance wireless communications.

Knowledge and implementation of security features is essential for an efficient and effective wireless network.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Describe the characteristics of Wireless LANs.*
2. *Describe wireless radio technology concepts.*
3. *Configure a small wireless network.*
4. *Implement wireless network security.*

ITNET-606-1610: Multimedia Networks

Unit Level (MQF/EQF): 6

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

Today's networks have changed significantly from those of the past. Whereas, traditionally, computer networks only dealt with simple data, today's networks are being used in a converged way to transport data, voice and video.

The requirements of multimedia applications are significantly different from other applications. Traditional parameters that were allowed in traditional networks such as latency and delay are significantly less tolerated in multimedia networks.

The aim of this unit is to provide learners with a thorough understanding of how multimedia content is prepared for transmission over a computer network. Learners will also be exposed to the technical challenges pertaining to the implementation of IP PBX and video streaming services. Implementation strategies for enterprise and service providers shall be considered.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Explain how multimedia content is prepared for transmission over a computer network.*
2. *Examine protocols used in multimedia networks.*
3. *Assess the impact of quality of service implementation in multimedia networks.*
4. *Plan and deploy multimedia services over a network.*

ITNET-606-1611: Software Defined Networks

Unit Level (MQF/EQF): 6

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

Software has enabled the customisation of devices that previously had a fixed configuration set at manufacturing stage. Through software, the operation of a device can evolve during its use to cater for the operational requirements.

The Open Networking Foundation (ONF) defines a Software-Defined Network (SDN) as "the physical separation of the network control plane from the forwarding plane, and where a control plane controls several devices". This enables an organisation's network architecture to be more responsive to its needs by having direct programmatic control over the operation of the network.

This unit delves into the detail of OpenFlow – the core SDN protocol. Learns shall be exposed to the technical details of this protocol along with the interaction between network devices and the controller.

The focus of this unit is on the practical aspects of SDN. For this reason, various real-world case studies shall be explored. Practical exercises using virtual environments and controllers are core elements.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Explain the fundamentals of software-defined networks.*
2. *Describe the operation of the OpenFlow protocol.*
3. *Implement a software-defined network.*
4. *Analyse a software-defined network implementation.*

ITDVP-606-2101: Devops

Unit Level (MQF/EQF): 6

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

DevOps is the practice of combining the software development process with IT operations. Whereas in the past, people working in these two sectors were considered disjoint, with the emergence of DevOps these are now working together with the ultimate goal of delivering good quality software, through Agile methodologies.

This unit is intended for learners aspiring to work in IT operations. It exposes them to the principles of DevOps and how to work along with software developers to take a system to production.

This unit specification is technology independent and the lecturer is to use own professional judgement to choose the most appropriate solutions.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Implement a version control system within a DevOps environment.*
2. *Create production ready containers.*
3. *Use a container orchestration system to manage containers.*
4. *Implement a continuous integration / continuous deployment pipeline.*

ITNET-606-1613: Wide Area Networks II

Unit Level (MQF/EQF): 6

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

The purpose of this unit is to provide learners with an in-depth knowledge and understanding of WAN technologies, by being exposed to underlying principles and best practices typically implemented in real-life setups.

This unit is a continuation from the previous unit "WAN", where students should have already attained a level of understanding on the fundamentals of WAN technologies typically implemented by Internet Service Providers.

The first part of this unit will be specifically focused on layer 2 and layer 3 protocols with relevance to the OSI model, implemented in WAN setups. Some of the protocols which shall be covered are: PPP, HDLC and Frame Relay for layer2, BGP and Layer 3 MPLS for Layer 3.

Moreover, learners will also start to familiarise themselves with common WAN best practices, which are currently being applied in the IT industry; particularly DUAL WAN setups, VPNs, Firewalls and Intrusion Prevention Systems.

After having covered these deliverables, the last part of the unit will be specifically focused on the monitoring aspect, which is in-line to what organisations typically implement to give them detailed analysis of how their WAN link is being utilized.

In order to fulfil these deliverables, learners are expected to familiarise themselves with actual physical equipment and specific software to offer a simulated testing environment for adequate hands-on experience.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Understand and apply in practice, layer 2 and layer 3 protocols typically implemented in WANs.*
2. *Implement and configure Dual WAN Setups.*
3. *Implement and configure Virtual Private Networks (VPNs).*
4. *Implement security best practices by adhering to firewalling techniques and Intrusion Prevention Systems.*
5. *Monitor WAN traffic utilization via network monitoring tools.*

ITNET-606-1614: Cloud Infrastructure

Unit Level (MQF/EQF): 6

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

"Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."
—The NIST Definition of Cloud Computing, National Institute of Standards and Technology

More and more organizations are deciding to deploy services to a cloud service rather than hosting themselves due to the flexibility and benefits provided. The aim of this unit is to introduce learners to the enterprise features provided by cloud service providers such as AWS, Azure and Google.

Since this unit is targeted to learners studying computer systems and networks, its focus will be on the infrastructure side of cloud computing. Hence learners will be exploring various hardware and software elements that are important to support the computing requirements of a cloud based computing approach. Furthermore This includes deployment of virtual machine instances, network configuration, high-availability and security.

Special focus on cost considerations will be made. This is extremely important in view of the complex pricing structures used by cloud service providers.
Deployment of cloud based services using a private cloud shall also be considered. This includes technical analysis of the underlying infrastructure required to deploy such services.

Learning Outcomes

On completion of this unit the learner will be able to:

1. Explain the concepts of cloud computing.
2. Use compute and storage services in the cloud.
3. Apply the appropriate measures to secure services deployed in the cloud.
4. Design and implement advanced cloud services.

ITRSH-606-2102: Research Design 2

Unit Level (MQF/EQF): 6

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

The main focus of Research Design II unit is to help learners gain a more in-depth understanding of research design in ICT, thereby, enabling them to evaluate the different ways in which research may be conducted and to choose the approaches that most suit their goals based on already published research and academic theories.

Amongst the most important topics to be covered are the analysis of a hypothesis to better define the scope of a research and to clarify the aim and objectives of a research in view of an applied problem in a specific domain. Knowledge of different research approaches and testing strategies is also paramount; this will lead to the selection and justification of the most appropriate approaches/strategies for the chosen research based on sound academic theories and past research published through conference proceedings and journal articles. Such knowledge will provide the learners with the necessary know-how to present data gathered from results in a manner that is clear and effective for inferring patterns and developing sound and unbiased conclusions with regards to their hypothesis. Critical reflection upon decisions taken throughout the research journey, especially with regards to the chosen research approach, methodology and testing strategies is also an important aspect of this unit for evaluating one's own research in the light of future improvements.

The delivery of the unit should also capitalize on the opportunity to foster a collaborative research environment between learners where they can discuss their research ideas with each other, as peers, and provide constructive criticism/suggestions on how a research idea/approach can be improved. Sharing of knowledge, ideas, opinions and academic resources for carrying out such research is to be encouraged and viewed as an integral part of healthy academic discussion and knowledge sharing.

Proper presentation of the learner's own work carried out during research is also an important part of the unit; tools that support the management of references and the formatting of scientific documents to adhere to well known, pre-defined formats suitable for submission of papers for conference proceedings or articles in scientific journals will be explored.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Propose the most suitable methodology for a chosen research.*
2. *Analyse testing strategies used for validating a hypothesis.*
3. *Analyse collected data to arrive to findings and conclusions for a chosen research*
4. *Produce scientific documents using appropriate writing styles, document formats and tools.*

CDWBL-506-1902: Work Based Learning 2

Unit Level (MQF/EQF): 5

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

Work-based learning is an instructional method that provides a direct link between work experience and college based learning. A key element in such experiences, is the development of critical thinking. The ability to think critically is fundamental and is sought after by employers in various sectors. Critical thinkers will approach and solve problems methodically rather than by intuition or instinct. Critical thinking is important because it helps individuals and teams more effectively diagnose problems and identify possible solutions that aren't entirely obvious at first. WBL exposes learners to real world environments in order to promote and develop critical thinking. Apprentices, particularly at degree level, are also expected to take initiative and propose solutions to different problems that are faced day to day in various workplace settings. Through their apprenticeship experience, learners are expected to develop strong problem solving skills and use particular incidents as learning opportunities

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Examine the significance of critical thinking in degree apprenticeships.*
2. *Discuss the role of critical reflection within an experiential learning cycle.*
3. *Apply the IDEALS approach to effective thinking and problem solving.*
4. *Evaluate critical incidents and compile a critical incident journal.*

CDKSK-503-1907: English I

Unit Level (MQF/EQF): 5

Credits: 3

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 75

Unit Description

This unit is intended to be run in the first semester of the first year of undergraduate degree programmes and consolidates prior knowledge, skills and competences in English reading, writing, listening and speaking by further strengthening the more academic functions of the language.

English I is intended to be an EAP (English for Academic Purposes), focusing specifically on improving learners' awareness of, and familiarity, with the core skills necessary for successful academic reading and writing in English, especially preparing them for the rigours of extended writing by research and the reading of academic sources of information.

Learners will become familiar with academic features of style and the principles and mechanics of good text structure. They will also learn how to consult, understand and use secondary material from academic sources within their field of study and effectively integrate it as part of a larger argument or body of work.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Recognise the form, content and style of academic texts;*
2. *Use an academic style of writing when working on assignments and dissertations;*
3. *Reproduce secondary content by means of direct and indirect quoting methods;*
4. *Apply proper referencing conventions when citing secondary content.*

CDKSK-503-1908: English II

Unit Level (MQF/EQF): 5

Credits: 3

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 75

Unit Description

This unit is intended to be run in the second semester of the second year of undergraduate degree programmes and consolidates prior knowledge, skills and competences of Academic English by further strengthening reading, writing, listening and speaking skills as determined by the rigours of pre-dissertation research.

English II is targeted at learners who have successfully completed their degree programme's first year and exposes undergraduate students to a higher level of critical reading and writing skills demanded in the second and final years of the degree programme. This usually involves the identification and select reading of academic texts, their review and their eventual use in a research proposal, dissertation and academic presentation.

It is also the objective of this unit to train learners to be more aware of, and proficient in, spoken Academic English as this becomes a key requirement at this level of studies.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Evaluate academic sources of information when working on own dissertation;*
2. *Produce texts of an academic nature using appropriate language and style;*
3. *Communicate verbally in a manner which conveys proficiency of the subject being researched;*
4. *Respond effectively to key questions in relation to research in own field.*

CDKSK-602-2105: Community Social Responsibility

Unit Level (MQF/EQF): 6

Credits: 2

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 50

Unit Description

This unit focuses on community and social responsibility skills and provides an opportunity for learners to better understand themselves and others, as well as establish goals in life. Community and social responsibility skills enable learners to understand their strengths and areas that need improvement while preparing them for life, employment and to become active citizens in society.

Moving away from traditional delivery of other units, learners will be empowered to take ownership of their learning process. Hence, this unit will be delivered through a combination of workshops, small-group sessions with mentors and various opportunities to reflect.

The first set of sessions will focus on the self, the ability to work independently and the important values in life. The second set of sessions will focus on working with others, dealing with diversity and conflicts. Furthermore, at the end of the sessions, learners will be introduced to the importance of active citizenship in life.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Identify personal goals through self-reflection.*
2. *Evaluate how collaboration with others can be more effective.*
3. *Explain the importance of giving and receiving feedback.*
4. *Contribute actively to make a difference in society.*

CDKSK-604-1909: Entrepreneurship

Unit Level (MQF/EQF): 6

Credits: 4

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 100

Unit Description

The working definition of '**entrepreneurship**' employed in this unit is that stated by the European Commission: "*Entrepreneurship refers to an individual's ability to turn ideas into action. It includes creativity, innovation and taking calculated risk, as well as the ability to plan and manage projects in order to achieve objectives. This supports everyone in day-to-day life at home and in society, makes employees more aware of the context of their work and better able to seize opportunities, and provides a foundation for entrepreneurs establishing a social or commercial activity*" (Entrepreneurship in Vocational Education & Training, June 2009).

In line with this definition, the unit places an emphasis on fostering a mind-set that *entrepreneurship* is the vehicle that drives *creativity* and *innovation*. The learner will, amongst others, be encouraged to gain an insight as to how to investigate customer needs and markets to generate an innovative idea for a start-up; participate in the realistic simulation of the creation of a start-up[1]; create and pitch sections of a business plan, as well as draft sections of a business plan for an identified business idea.

The assessment of the unit is designed in a way to provide an opportunity for learners to strengthen transversal competencies which UNESCO highlights as necessary for the 21st century. These include intrapersonal skills, interpersonal skills, critical and innovative thinking, media and information literacy and global citizenship.

[1] 'Doing effective entrepreneurship' is firmly grounded in theory, yet the *chalk and talk* delivery mode is not promoted in this unit. Rather, *actionable theory through practice* is strongly encouraged. *Realistic simulations*, limited not only to in-class activities such as *discussions* of the problems faced in the different phases of a business, especially in the process of commercialisation of innovative products and services, and *on-paper* creative management strategies, are considered essential.

Learners with different backgrounds and experiences are required to contribute actively in a team to prepare the necessary work towards initiating a successful business venture.
In this unit, learners will become familiar not only with the main theories related to entrepreneurship and business start-ups but will have the opportunity to explore, interact and learn from a number of first-hand situations. The challenges of working with diverse team members will provide the learners not only with the possibility to look at entrepreneurship ideas from different perspectives, but also to come up with more creative, original and feasible solutions to challenges that will arise.

The practical and realistic element of the unit will allow learners to engage and interact with different stakeholders from industry and public institutions. This real-life interaction will provide the ideal set up to link theory with practice in the real world. Learners are encouraged to get out of their comfort zone and explore their entrepreneurial spirit by combining creativity, innovation and risk taking to help seize an opportunity, improve current situations or solve problems they encounter in the real world.

Learning Outcomes

On completion of this unit the learner will be able to:

1. *Understand the terms "entrepreneurship" and "entrepreneur" and techniques used to generate and evaluate business ideas;*
2. *Examine important considerations while developing a new business idea;*
3. *Apply business planning and control initiatives while developing a new business idea;*
4. *Contribute effectively in a team to develop a concept prototype of a feasible product/service idea.*