



MCAST

MQF/EQF Level 4

AS4-03-21

Advanced Diploma in Environmental Sustainability

Course Specification

Course Description

Awareness of environmental sustainability and related environmentally-based sectors is growing rapidly in Europe, with the Maltese government recently introducing various laws and standards on reducing global warming, climate change, low carbon emissions and the need for conservation in general. This programme of studies includes topics related to environmental monitoring, even within manufacturing industries, that are fundamental to the development of environmental awareness, and provides the necessary practical skills and techniques. Employment is typically within environmental sustainability sector-based organisations, as well as within medium to large organisations that face many environmental challenges, such as waste management, alternative energy sources, traffic management and pollution, on a daily basis.

Programme Learning Outcomes

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

- 1. Understand and apply the principles of sustainable development.*
- 2. Carry out justification exercises and feasibility studies leading to the efficient and effective utilization of resources.*
- 3. Understand current legislation and best practice relevant to waste, pollution and efficiency in resources utilisation.*
- 4. Implement an investigative environmental sustainability project.*

Entry Requirements

MCAST Diploma in Applied Science

OR

MCAST Diploma in Mechanical Engineering

OR

MCAST Diploma in Engineering (Electronics)

OR

Any MCAST Level 3 Diploma, whilst being in possession of the compulsory subjects as indicated hereunder

OR

4 SEC/O-Level/SSC&P (Level 3) passes, of which three (3) subjects must be from the following list: English Language, Mathematics, Physics, Chemistry, Biology, Design and Technology, Computer Studies, Environmental Studies

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	
Level 4	VET Level 5 Programme ²⁵	60-120	Less than 120
	Pre-Tertiary Certificate	30	
	VET Level 4 Programme ²⁶	120	
Level 3	MATSEC Certificate	NA	Less than 60
	VET Level 3 Programme ²⁷	60	
Level 2	General and Subject Certificate	NA	Less than 60
	VET Level 2 Programme ²⁸	60	
Level 1	General and Subject Certificate	NA	Less than 40
	VET Level 1 Programme ²⁹	40	
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: 3000

Mode of attendance: Full Time

Duration: 2 Years

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

Target group: Students exiting compulsory education

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 Ghonoq Targa Gap,

Mosta

Institute of Applied Sciences,

Centre of Agriculture, Aquatics and Animal Sciences,

Luqa Road, Qormi

Gozo Campus

J.F. De Chambray Street

MCAST, Ghajnsielem

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 004* 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 004* 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 through 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 join 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
ASENV-406-1503	Basic Environmental Impact Assessment and Water/Energy Auditing	6	1	1&2
ASCHM-406-1520	Basic Chemistry for Environmental Technicians	6	1	1&2
ASSDV-406-1502	Sustainable Transport	6	1	1&2
ASENV-406-1502	Understanding the Principles of Wildlife Populations, Ecology and Conservation	6	1	1&2
ASWBL-403-2005	Work Related Experience in Environmental Sustainability Sector 1	3	1	1&2
ASPRJ-403-2006	Investigation Project in Environmental Sustainability 1	3	1	1&2
ASENV-406-1506	Understanding Water Quality	6	1	1&2
ASENV-406-1507	Pollution Control and Management	6	1	1&2
ASAPS-406-1510	Scientific Practical Techniques	6	1	1&2
CDKSK-406-2001	English	6	1	1&2
CDKSK-406-2007	Mathematics	6	1	1&2
ASSDV-406-1501	Understanding the Principles of Sustainable Development	6	2	1&2
ASEGY-406-1501	Energy Management	6	2	1&2
ASENV-406-1504	Introduction to Waste Management	6	2	1&2
ASENV-406-1505	Understanding the Principles of Physical and Biological Environmental Processes	6	2	1&2
ASWBL-403-2006	Work Related Experience in Environmental Sustainability Sector 2	3	2	1&2
ASPRJ-409-2007	Investigation Project in Environmental Sustainability 2	9	2	1&2
ASSDV-406-1503	Sustainable Construction	6	2	1&2
ASGEO-406-1501	Geology of Natural Resources	6	2	1&2
CDKSK-404-1915	Employability and Entrepreneurial Skills	4	2	1
CDKSK-402-2104	Community Social Responsibility	2	2	1
CDKSK-406-2109	Information Technology	6	2	1&2
Total ECTS		120	/	/

The semester/year assigned to the modules may change according to the exigencies of the Institute or due to unforeseen circumstances. Students will be informed beforehand of any necessary changes.

ASSDV-406-1501: Understanding the Principles of Sustainable Development

Unit level (MQF/EQF): 4

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

This unit will introduce students to the topical subject of sustainable development, with the aim of fostering a comprehensive understanding of the multi-faceted, complex and sometimes controversial nature of this concept. The origins of ideas of sustainability and sustainable development will be briefly explained, together with a review of how these have evolved over time, through references to key events in history. Current sustainability challenges will be discussed, with reference to both local and global scales.

The various principles that underpin the concept of sustainable development will be explored in detail throughout this unit. The unit will also focus on the key pillars of sustainability, namely environmental, socio-cultural and economic systems. The importance of prudent resource and environmental management in relation to sustainable development will be explained, with an overview of the critical support role provided by environmental systems. Similarly, the influence of social and economic factors on sustainability will be discussed, as will interactions between these three 'pillars'. Finally, the unit will provide an overview of ways in which we can make progress towards improved sustainability and sustainable development, also providing an overview of initiatives to promote sustainability.

This Unit is relevant to learners wishing to improve their understanding of sustainability, and of its relevance to environmental conservation. By the end of the unit, students will be able to explain the meaning of the term 'sustainable development', while appreciating the complexities of this concept. Students will also be able to explain how ideas of sustainability became influential and evolved over time, and will be able to discuss the important link of sustainable development to world environmental, economic and socio-cultural systems. The knowledge gained in this unit will allow students to reflect critically on the concept of sustainability and on its local and global importance.

Learning Outcomes

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

1. *Explain fundamental concepts of sustainability and sustainable development.*
2. *Describe the influences of environmental, socio-cultural and economic systems on sustainability.*
3. *Recognize and describe initiatives that aim to foster sustainable development.*
4. *Reflect critically on the goal of sustainability and on how this can be achieved.*

ASENV-406-1503: Basic Environmental Impact Assessment and Water/Energy Auditing

Unit level (MQF/EQF): 4
Credits: 6
Delivery Mode: Face to Face
Total Learning Hours: 150

Unit Description

This unit will provide students with an introductory understanding of environmental impact assessment (EIA) and environmental auditing (EA) concepts and processes.

Environmental impacts will first be explained with reference to changes from baseline conditions. The importance of understanding and mitigating environmental impacts in line with key sustainable development principles, notably the precautionary principle and adaptive management will be explained, as will the rationale for EIA and EA. The goals and scope of both these processes will be outlined. Following this, typical EIA and EA processes will be described, enabling students to understand the logical sequence of these processes and the way in which each step builds on previous ones. The unit will also familiarise students with relevant instruments relating to EIA and EA, including the European Union's EIA Directive and its transposition into local legislation, the EU Eco-Management and Audit Scheme (EMAS), and ISO 14001 certification. Finally, the unit will take a closer look at the auditing of water and energy, providing an overview of the key parameters addressed by these two processes.

The Unit is relevant to learners wishing to develop basic comprehension of EIA and EA processes. On completion of the unit, learners will be conversant with relevant terminology, and will be familiar with the various stages of both processes. Students will also be able to understand and explain why EIA and EA are fundamental to sustainable development and environmental protection, as also how and why EA can be beneficial to the functioning of organisations.

Learning Outcomes

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

1. *Explain the rationale for assessment and auditing of environmental impacts.*
2. *Describe the fundamentals of Environmental Impact Assessment (EIA).*
3. *Describe the fundamentals of environmental auditing.*
4. *Identify and describe basic principles of water and energy auditing.*

ASCHM-406-1520: Basic Chemistry for Environmental Technicians

Unit level (MQF/EQF): 4

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

This unit assumes knowledge of basic chemistry, up to SEC (O Level Standard). However, the initial part of the course shall cover all the introductory chemistry that is normally delivered in SEC classes.

Learners shall be first exposed to the principles of chemistry that are essential to grasp the applications of chemistry to environmental studies. All the basic principles of chemistry shall be related to environmental applications wherever possible.

Environmental Chemistry is the science of reactions and pathways of matter that influences mankind and his environs. It deals with the air we breathe, the water we drink, the soil that grows our food. There is a tremendous concern today about the uses—and particularly the misuses— of chemistry as it relates to the environment, ranging from individual exposures to toxicants to phenomena on a global scale that may cause massive, perhaps catastrophic, alterations in climate.

The unit shall deal with the origins, transport, reactions, effects, and fates of chemical species in the water, air, earth, and living environments and the influence of human activities thereon.

Basic Chemistry for Environmental Technicians (Level 4), provides a framework for the study of chemistry, dealing with basic chemical concepts such as organic chemistry, chemical analysis, physical chemistry and toxicological chemistry, which directly relate to environmental chemistry. The objective is to break down the barriers that tend to compartmentalize chemistry by laying two major goals:

- a) to provide an overview of chemical science within an environmental chemistry framework,
- b) to provide the basics of environmental chemistry for technicians.

A crucial part of chemistry is an understanding of the nature of chemical compounds, the chemical formulas used to describe them, and the chemical bonds that hold them together. It is essential to know some things about the chemical reactions by which chemical compounds are formed. These are topics that are included in this unit in order to give the student the essential concepts and terms required to understand more-advanced environmental chemical material.

Chemistry is responsible for the observed variation, processes such as ozone depletion, greenhouse effect and global warming, in Atmospheric Chemistry and Air Pollution.

Chemistry is required to understand the organic and inorganic chemical processes controlling the chemical composition of the aquatic environment and the fate of pollutants in the Aquatic Environment.

Chemistry controls the chemical and physical characteristics of soils Soil Chemistry, as well as the various ways in which soils are polluted.

Learning Outcomes

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

1. *Comprehend basic chemistry concepts as applied to environmental concepts.*
2. *Develop and enhance the essential skills and techniques required in the monitoring of environment chemical parameters.*
3. *Apply the skills and techniques required in recognising the risks to the air water and ground environment from natural and anthropogenic chemical parameters.*
4. *Apply the skills and techniques required in applied environmental chemistry decision making following monitoring and analysis.*

ASEGY-406-1501: Energy Management

Unit level (MQF/EQF): 4
Credits: 6
Delivery Mode: Face to Face
Total Learning Hours: 150

Unit Description

As fossil fuel prices have been increasing drastically during the past few years, the cost of energy and its sustainability is undoubtedly a major global concern. In a world where energy consumption is on the increase, the term 'Energy Conservation' is by far more than a frivolous term.

Fossil fuel resources are depleting and as a result, their cost is continually increasing. Furthermore, their use is contributing to high levels of pollution and greenhouse gas emissions. These lead to very rapid climatic changes and thus affect undeniably the quality of human life. In this scenario, today more than ever, it has become increasingly important to develop energy efficient processes and it is imperative to seek for alternative energy resources other than conventional fuels, which are still the dominant energy source. Such possible alternative energy sources are renewable energies, which, as their name imply, are defined as energies derived from resources that are regenerative or for all practical purposes cannot be depleted. Types of renewable energy resources include moving water (hydro, tidal and wave power), thermal gradients in ocean water, biomass, geothermal energy, solar energy, and wind energy. Municipal solid waste (MSW) is also considered to be a renewable energy resource.

This unit is aimed to enable learners to be knowledgeable about various aspects regarding energy management. Learners will be exposed to legislation and international agreements concerning energy management. They will also learn strategies to identify key performance indicators in order to improve the energy efficiency of processes, and thus reducing the carbon footprint. Learners will also be able to devise and carry out an energy audit according to required specifications and will also be capable of monitoring and making recommendations for energy-saving measures.

By the end of this unit learners should be able to gain knowledge about energy management, be able to plan and carry out an energy management audit. They should also be capable of monitoring and targeting energy savings.

This study unit is suitable for learners wishing to gain and/or enhance their knowledge on energy management in general. This unit is aimed for learners wishing to increase their awareness on energy conservation, both on a personal and organisational level.

Learning Outcomes

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

1. *Recognise various aspects regarding energy management.*
2. *Devise an energy audit according to required specifications.*
3. *Perform an energy audit according to required specifications.*
4. *Monitor and make recommendations for energy reduction measures.*

ASENV-406-1504: Introduction to Waste Management

Unit level (MQF/EQF): 4

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

Mismanagement of waste is unsustainable, mainly because it squanders earth's resources and pollutes the environment. Yet, human activities, be they of a domestic or industrial nature, produce waste. Each year in the European Union alone approx. 3 billion tonnes of waste are generated.

Sustainable waste management addresses the challenges posed by waste by reducing the amount of waste that is produced, by recovering materials and energy from unavoidable waste, and by reducing the environmental impact related to its final disposal.

Sustainable management of waste benefits the economy of a country by reducing environmental degradation and by creating green jobs. However, in managing waste there are environmental risks. This is the reason why in the European Union the activity is tightly regulated by approx. 30 binding legislative instruments. Moreover, the process of regulating the waste sector is a dynamic one, with old legislation being reviewed and new legislation being adopted. This is challenging to the waste sector itself and to businesses that generate the waste.

For the above reasons, it is of the utmost importance that tomorrow's workforce be fully informed of the obligations and opportunities that are related to the waste sector.

This is a knowledge-based Unit and is designed to provide the students with basic knowledge on how waste can be sustainably managed and the legislative controls that are in place. The Unit also prepares those students who intend to further develop their knowledge on the subject.

Learning Outcomes

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

- 1. Identify the main factors related to the generation of waste.*
- 2. Recognise the nature of waste and its effects on human health and the environment.*
- 3. Outline the main legislative instruments related to the management of waste.*

4. *Review the waste hierarchy and selected techniques for managing waste.*

ASSDV-406-1502: Sustainable Transport

Unit level (MQF/EQF): 4

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

This is a skills based unit and will allow learners to demonstrate they have the necessary skills to be able to understand the term sustainability as applied to transport. Learners will be able to understand the importance of making the right choices when making use of transport facilities. They will also be able to understand our various means of transportation outside the concept of being carried away from point A to point B. Hence the concept of utilising alternative and more sustainable means of transport which are more environment friendly and which have a lower impact on the surrounding environment.

The Unit is relevant to learners wishing to further develop their knowledge about alternative and environmental friendly modes of transportation. On completion of the Unit learners will be able to distinguish between various forms of fuels and the impacts these have on our environment. They will be able to understand the benefits of reducing transport movements. They will also be able to choose the best mode of transport with the least environmental impact in different scenarios. They will be able to understand the relationship between modes of transport and the atmospheric gases found in our environment and the consequential effects these might have on our lives.

Learners will carry out fieldwork in order to better understand the correlation between vehicular movements and atmospheric pollution. This will be done through traffic counts at junctions and atmospheric pollution results. Learners will carry out fieldwork to obtain data about predominant modes of transport used at different times of the day and localities in the Maltese Islands.

Finally, learners should have the underpinning knowledge and understanding to recommend sustainable modes of transportation in different local scenarios.

Learning Outcomes

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

1. *Explain the relationship between fuel use, transportation and our wellbeing.*
2. *Explain the impacts of transport.*

3. *Explain the pros and cons of conventional and alternative modes of land transport.*
4. *Explain how to make transportation sustainable.*

ASENV-406-1502: Understanding the Principles of Wildlife Populations, Ecology and Conservation

Unit level (MQF/EQF): 4
Credits: 6
Delivery Mode: Face to Face
Total Learning Hours: 150

Unit Description

This unit introduces learners to the ecological concepts of populations and ecosystems and how these are applied in practice for environmental management and conservation. Awareness and understanding of the importance of ecology and conservation has increased in recent times, particularly due to the promotion of causes and campaigns for conservation and management of natural resources, to reduce human impact on the environment and ensure long-term environmental sustainability. This unit is therefore designed to enable learners to understand the basic principles of ecology and dynamics of wildlife populations, and how the application of such principles in different conservation strategies.

In this unit learners will develop an understanding of ecosystem ecology and population dynamics, with particular reference to natural changes in ecosystem components and population abundance of individual species, and how these are affected by different anthropogenic activities. Such knowledge will be related to the aspects of environmental conservation, with particular reference to the management of wildlife populations and their habitats. This will be linked to field studies of populations and habitat surveys, enabling learners to appreciate the role of such studies in providing the information on the status of species and habitats that is necessary to set conservation goals and guide management decisions.

Learning Outcomes

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

- 1. Describe changes in global ecosystems.*
- 2. Examine population dynamics.*
- 3. Outline conservation strategies for wildlife and their habitats.*
- 4. Conduct a field study of habitats and wildlife populations.*

ASENV-406-1505: Understanding the Principles of Physical and Biological Environmental Processes

Unit level (MQF/EQF): 4
Credits: 6
Delivery Mode: Face to Face
Total Learning Hours: 150

Unit Description

This unit is designed to introduce students to the physical and biological environmental processes that are fundamental to the functioning of planet Earth. The unit will first address the crucial role of energy as a driving force of Earth processes, before looking at the transfer of energy to planet Earth through the atmosphere. The second part of the unit will focus on the geological resources of planet Earth through a focus on the lithosphere, providing students with an explanation of how this operates through the rock cycle. The third theme of the unit will be the biosphere, with a focus on the necessities of life and on the fundamental processes that occur in all ecosystems. Finally, the unit will consider the hydrosphere and the crucial role of water for life.

The Unit is relevant to learners wishing to develop a basic understanding of Earth processes. On completion of the Unit, learners will have intermediate level competence in this subject area and should be able to draw links between the different physical and biological processes discussed, to understand how these are all interconnected. The unit will also familiarise students with the way in which these processes determine various physical characteristics of the Maltese Islands.

Learning Outcomes

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

- 1. Describe the scientific principles and processes that influence energy transfer and the atmosphere as part of the earth-atmosphere system.*
- 2. Describe physical and biological processes occurring within the lithosphere.*
- 3. Describe physical and biological processes occurring within the biosphere.*
- 4. Recognise how water is managed and used within the hydrosphere.*

ASWBL-403-2005: Work Related Experience in Environmental Sustainability Sector 1

Unit level (MQF/EQF): 4
Credits: 3
Delivery Mode: Face to Face
Total Learning Hours: 75

Unit Description

This is a skills based unit that will allow learners to demonstrate that they have the necessary skills to be able to understand the importance of sustainable approaches on the workplace, and to be able to plan, undertake and review work-based experience in the environmental sustainability sector. Learners will familiarise themselves with important aspects of sustainable approaches, such as their importance, impacts, the opportunities they provide and several popular techniques currently implemented.

The Unit is relevant to learners wishing to further develop their knowledge and understanding of a sustainable approach to businesses, and the ways with which they can access the various career opportunities this stream offers. On completion of the Unit, learners will have grasped the three step process to preparing for sustainable based work-related experience: prepare, undertake and review. They will obtain insight into what steps are required in the application process, what skills are required in an interview, and how they can prepare to start work. Furthermore, learners will gain knowledge of various methods with which they can keep track of their progress, as well as methods of how they can review their performance for self-improvement. Learners will also be able to implement a Personal Development Plan for their work-related experience.

Learners will carry out independent research and study to obtain important inductive insight into work-based experience in the environmental sustainability sector.

Learning Outcomes

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

- 1. Recognise the importance of applying a sustainable approach in the workplace.*
- 2. Prepare for a sustainable work-related experience in the environmental sustainability sector.*

3. *Undertake a work-related experience in the environmental sustainability sector.*
4. *Review a work-related experience in the environmental sustainability sector.*

ASWBL-403-2006 Work Related Experience in Environmental Sustainability Sector 2

Unit level (MQF/EQF): 4
Credits: 3
Delivery Mode: Face to Face
Total Learning Hours: 75

Unit Description

Anyone who has ever worked on a project will agree that making a project succeed is no simple task. The difficulties manifest themselves in delays, budget over-runs, inadequate results, dissatisfied customers, high stress among the project team and other undesirable outcomes. What is the cause of all of these problems?

The aim of this study unit is to start training learners in all the processes involved in proposing and undertaking an extended investigative project in the environmental sustainability sector. The learners will be able to conduct a thorough literature review and compile a proposal with the intentions of eventually carrying out an investigative project.

Learners should aim to carry out the investigative project within an organisation, be it a local authority, a charity or voluntary organisation, an industry organisation, or a local community group. The project can be carried out over a single stretch of a few weeks, or else during weekends or recess periods. The project will help the learners to develop project management and communication skills by investigating a topic of their choice.

It is suggested that the learners explore three topic areas that interest them and are relevant to their field of study. Subsequently, and following supervisors' advices, learners should decide on one area of study that will form the basis of their investigative project.

Learners will develop this skill of taking responsibility of their own learning by choosing independently their own research problem to be solved. They should produce a breakdown of resources and a project action plan including intermediate deadlines.

Learning Outcomes

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

1. *Understand what a literature review is in research.*
2. *Assess literature sources for authenticity and validity.*
3. *Carry out an effective literature review using a number of sources or databases.*
4. *Formulate a research question related to an efficient literature review.*
5. *Write a proposal for an environmental investigative research project.*

ASPRJ-403-2006: Investigation Project in Environmental Sustainability 1

Unit level (MQF/EQF): 4

Credits: 3

Delivery Mode: Face to Face

Total Learning Hours: 75

Unit Description

Anyone who has ever worked on a project will agree that making a project succeed is no simple task. The difficulties manifest themselves in delays, budget over-runs, inadequate results, dissatisfied customers, high stress among the project team and other undesirable outcomes. What is the cause of all of these problems?

The aim of this study unit is to start training learners in all the processes involved in proposing and undertaking an extended investigative project in the environmental sustainability sector. The learners will be able to conduct a thorough literature review and compile a proposal with the intentions of eventually carrying out an investigative project.

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Learners will develop this skill of taking responsibility of their own learning by choosing independently their own research problem to be solved. They should produce a breakdown of resources and a project action plan including intermediate deadlines.

Learning Outcomes

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

1. *Understand what a literature review is in research.*
2. *Assess literature sources for authenticity and validity.*
3. *Carry out an effective literature review using a number of sources or databases.*
4. *Formulate a research question related to an efficient literature review.*
5. *Write a proposal for an environmental investigative research project.*

ASPRJ-409-2007 Investigation Project in Environmental Sustainability 2

Unit level (MQF/EQF): 4

Credits: 9

Delivery Mode: Face to Face

Total Learning Hours: 225

Unit Description

Anyone who has ever worked on a project will agree that making a project succeed is no simple task. The difficulties manifest themselves in delays, budget over-runs, inadequate results, dissatisfied customers, high stress among the project team and other undesirable outcomes. What is the cause of all of these problems?

The aim of this study unit is to continue training learners in all the processes involved in proposing and undertaking an extended investigative project in the environmental sustainability sector. Following the literature review and the compilation of a proposal, this unit will allow the learners to build on such foundation and subsequently carry out an investigative project.

Learners should aim to carry out the investigative project within an organisation, be it a local authority, a charity or voluntary organisation, an industry organisation, or a local community group. The project can be carried out over a single stretch of a few weeks, or else during weekends or recess periods. The project will help the learners to develop project management and communication skills by investigating a topic of their choice.

It is suggested that the learners explore three topic areas that interest them and are relevant to their field of study. Subsequently, and following supervisors' advices, learners should decide on one area of study that form the basis of their investigative project.

Learners will develop this skill of taking responsibility of their own learning by choosing independently their own research problem to be solved. They should produce a breakdown of resources and a project action plan including intermediate deadlines.

Learning Outcomes

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

1. *Select a suitable method to answer the selected research question(s).*
2. *Distinguish between different types of data.*
3. *Evaluate the main findings of the research conducted.*
4. *Perform an impact assessment.*
5. *Present the investigative project.*

ASENV-406-1506: Understanding Water Quality

Unit level (MQF/EQF): 4
Credits: 6
Delivery Mode: Face to Face
Total Learning Hours: 150

Unit Description

A good standard of water quality is essential for every living thing on our planet to survive. Water pollution can have devastating effects on aquatic life and humans. Recording, monitoring and controlling water quality is vital to ensuring standards are maintained.

This unit aims to equip learners with the skills and knowledge associated with water quality analysis. Learners will gain an understanding of the factors that impact on water quality including human activity. Physical, biological and chemical factors will be investigated and a thorough understanding of their influence on water quality will be gained. The principles of water treatment will be covered to ensure learners have an understanding of the processes involved and the management of water quality in a work based setting.

Scientific techniques will be experienced by learners to allow them to confidently progress into industry. Skills including recording results, interpreting data and drawing conclusions from analytical data will be practiced.

Learning Outcomes

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

- 1. Describe factors that impact on water quality.*
- 2. Measure basic water quality factors.*
- 3. Record and interpret water quality data.*
- 4. Explain the principles of water treatment.*

ASENV-406-1507: Pollution Control and Management

Unit level (MQF/EQF): 4
Credits: 6
Delivery Mode: Face to Face
Total Learning Hours: 150

Unit Description

This unit enables learners to gain an understanding of air, noise, land and water pollution control and management. Moreover, the unit extends the learners' comprehension of the environmental impacts of pollution. Learners will also investigate the practical application of pollution control and management.

The natural environment is threatened by a wide range of anthropogenic activities, including emissions of contaminants and waste generation. In order to protect the environmental health, it is necessary that emissions to the environment are controlled. In instances where contamination has already taken place, it may be fundamental to remediate the contaminated sites. This unit focuses on the nature and sources of different pollution types and how they affect the natural systems, and how effective environmental management can control and mitigate the impacts of pollution.

This unit introduces the learner to pollution and how it affects the natural environment and systems. The key types of pollution in the Maltese Islands are then investigated. Using a specific fieldwork investigation, the learners will assess the impact of pollution on the environment. The learners will be exposed to the relevant current legislation in the Maltese Islands and will develop an understanding of the roles that national agencies play in the control and management of pollution.

Learning Outcomes

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

- 1. Define pollution and describe the natural environment and systems that are affected by pollution.*
- 2. Identify the causes and effects of key types of environmental pollution in the Maltese Islands.*
- 3. Assess the impact of a local marine activity or a coastal developmental site on the environment.*
- 4. Discuss current legislation related to pollution.*

ASAPS-406-1510: Scientific Practical Techniques

Unit level (MQF/EQF): 4

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

This is a skills based unit that will allow learners to demonstrate that they have the required skills needed to carry out a variety of analytical techniques that are commonly used on a daily basis in the laboratory. Learners will be able to carry out both quantitative and qualitative techniques and become familiar with the most common analytical techniques used in the laboratory.

This unit is relevant to learners who wish to become familiar with analytical techniques used to separate and assess the purity of substances. These include sampling methods for solids, liquids and gases; separation techniques used on mixtures and solutions and the common methods used for the estimation of purity of a sample. Learners will become familiar with quantitative analytical techniques that are used for routine analysis in the laboratory together with qualitative techniques for the identification of cations and anions in solids and solutions.

The learner will be provided with the ability to be able to use a variety of instruments in order to determine a number of physical and chemical properties of substance. This unit will enable the learners to understand both the theory and application of analytical techniques. It will require the learner to actively participate and undertake experiments in the laboratory.

Finally, the learners should be able to apply the knowledge and understanding acquired during the unit to follow written procedures, plan and carry out laboratory experiments; followed by reporting of the data obtained in the experiments.

Learning Outcomes

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

1. *Describe a variety of scientific techniques to separate and determine the purity of substances.*
2. *Apply quantitative and qualitative analytical techniques.*

- 3. Use a variety of instruments that are commonly used to determine the chemical composition and physical properties of substances.*
- 4. Perform experiments to identify and determine quantity or purity of a substance.*

ASSDV-406-1503: Sustainable Construction

Unit level (MQF/EQF): 4
Credits: 6
Delivery Mode: Face to Face
Total Learning Hours: 150

Unit Description

The aim of this unit is to enable learners to understand the impact of building construction activities on natural environment. Learners will find out about how the natural environment can be protected against these activities using the sustainable construction techniques.

The construction industry poses a major potential pollution threat to our environment and this unit will provide a fundamental understanding of how the activities of the construction sector impact on the natural environment. The techniques, processes and procedures used to protect the natural environment are investigated and the advantages of adopting a sustainable approach to construction work are explored in the contexts of energy, materials and waste.

Learning Outcomes

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

- 1. Identify the important features of the natural environment that need to be protected.*
- 2. Explain how the activities of the construction and built environment sector impact on the natural environment.*
- 3. Explain how the natural environment can be protected against the activities of the construction and built environment sector.*
- 4. Describe sustainable construction techniques that are fit for purpose.*

ASGEO-406-1501: Geology of Natural Resources

Unit level (MQF/EQF): 4

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

The aim of this unit is to explore the nature of rock, mineral and hydrocarbon resources. They will learn the formation of natural resources, their exploration and extraction as well as the environmental impact to these activities. Oil, metal ores and minerals are the essential part of our economy. We depend on these resources. Geological resources have been formed beneath the Earth's surface over millions of years. They have been formed by igneous, sedimentary and metamorphic processes throughout geological time. Geologists are involved in studying the formation of natural resources, carrying out prospection, exploration, extraction and processing of these resources. This unit examines how the environmental issues can be minimised during the resource exploitation.

Learning Outcomes

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

1. *Explain how geological resources are formed under the Earth's surface by geological processes.*
2. *Identify minerals, rocks and the geological structures.*
3. *Explain the strength of geological materials.*
4. *Identify methods used to explore the geological resources and to investigate their impact on the environment.*

CDKSK-402-2104: Community Social Responsibility

Unit Level (MQF/EQF): 4

Credits: 2

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 50

Unit Description

This unit focuses on Community Social Responsibility and provides an opportunity for learners to better understand themselves and the others and to establish goals in life. Community social responsibility enables learners to understand their strengths and areas for improvement and prepares 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, community social responsibility will be delivered through a combination of workshops, small-group sessions with mentors and various opportunities to reflect.

The set of sessions will tackle community social responsibility skills and will mostly focus on the self, the ability to work independently and important values in life. The second set of sessions will address interpersonal skills and will focus on working with others, dealing with diversity and conflicts. Furthermore, at the end of the sessions, the 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-404-1915: Employability and Entrepreneurial Skills

Unit Level (MQF/EQF): 4

Credits: 4

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 100

Unit Description

This unit complements the vocational and key skill units at Level 4 and provides an opportunity for learners to enhance their employability and entrepreneurial skills.

Quite often, learners tend to focus most on technical skills and competences required in a certain trade which enable them to access employment. On the other hand, employers expect employees to be appropriately skilled to follow instructions, take initiative, work effectively in a team, take a lead when necessary and more. In view of this the unit starts with an introduction to the 4th industrial revolution and proceeds to the transversal skills necessary to find employment, retain employment and advance at the place of work. Learners will be able to highlight their strengths and identify the areas that require improvement.

The rest of the unit focuses on entrepreneurial skills, a skill which is one of the most important transversal skills identified by UNESCO. Learners are introduced to methods which can be used to generate new and innovative business ideas and methods which help them evaluate ideas and choose the most feasible. Furthermore, learners will cover the various stages of product and/or service development, including market analysis, processes, pricing strategy, promotion and resources required.

Learners will work in a small team and by the end of the unit they will have the opportunity to develop a business idea which is commercially viable. Furthermore, they will present the idea to prospective investors/stakeholders.

CDKSK-406-2001: English

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

The main objective of this unit is to prepare students to use the English language to understand, analyse, organise and communicate specific technical knowledge by inferring meaning from, and using, embedded information, being able to evaluate information critically and communicate through different types of texts, as required by various but often specific technical contexts within the selected field of study.

The emphasis is on the processes needed to transition from use of the English language in General Education to that required for access to Higher Education.

In particular, L4 Key Skills English is targeted at learners who have completed Foundation College programmes (Levels 1 to 3) and seek to further their studies at Technical or Degree level.

In this respect, this unit recognises the necessity to meet two linguistic demands at this threshold level; strengthening students' linguistic competences to be able to communicate more specifically within their vocational area and stream and to prepare them for more rigorous academic thinking, research and writing as necessitated by degree courses.

Being introduced at this level are core and elective unit outcomes. Reading and writing outcomes are core components in this syllabus while listening and speaking are elective components. Every L4 programme must deliver the two core outcomes and any one of the two elective learning outcomes. The elective criteria to be assessed cannot be selected from and across both outcomes.

Learning Outcomes

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

1. *Read technical texts effectively to improve knowledge of the subject area;*
2. *Understand information presented orally in the form of recordings, or talks, discussions, seminars, interviews or presentations;*
3. *Demonstrate own understanding of the subject matter via oral presentation, mock interviews or similar oral delivery;*
4. *Write a research paper or technical report demonstrating cohesion, structure and appropriate style.*

CDKSK-406-2007: Mathematics

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

This unit provides a framework for students to develop mathematical thinking skills further to the level 3-unit specification to solve problems related to real-life situations. Students also develop skills, attributes and knowledge that contribute to their personal growth and effectiveness within their training and work environment and also within the community.

The unit is designed to adapt for the needs of a particular field of study (business & finance or engineering & transport and others).

To reach this goal the unit was divided into four learning outcomes which are related to statistics, graphical representation, game theory and finance. Through these different areas students will be able to develop the effective skills for information processing, reasoning, evaluation creative thinking and enquiry, all fundamental skills for the problem solving process. This will prepare students in applying and evaluating a range of strategies to solve real-life problems. Through this unit the learner will also learn to present and communicate results and conclusions effectively.

On successful completion of the unit the learner will be equipped with mathematical thinking skills which make them aware of and understand their thought process, to reassess and identify areas for development. Students learn to evaluate, reflect about their strategies, understand and verify results to solve problems. These skills will equip students with managerial skills, to further their studies and for work employability.

Learning Outcomes

On completion of this unit the student will be able to

1. *Demonstrate visual and logical techniques in evaluating graphical representations and communication skills in presenting the results effectively.*
2. *Apply information processing skills to solve problems in a relevant statistical context.*

3. *Demonstrate evaluation and communication skills in solving and presenting problems applied to costing methods and techniques.*
4. *Apply creative thinking skills and demonstrate evaluation skills to solve problems in a relevant (game theory) context.*

CDKSK-406-2109: Information Technology

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

This unit aims to impart to the learners the necessary skills to produce, report, and analyse their work in a digital environment. Based on five learning outcomes which when combined give the learners the possibility to create advanced reports, represent data visually, understand the target audience and prepare outstanding presentations as well as manipulate images. Finally, the unit shows the learners how to keep the files generated safe from various mishaps.

At this level, most of the reports being prepared by the learners will require a certain level of detail, possibly producing reports which contain a substantial number of pages. This unit will show the learners how to master such large documents. Some information is better represented in a visual form. Using spreadsheet software, this unit will demonstrate to the learners how to create advanced charts, create what-if scenarios as well as how to analyse and validate the data being inputted. Building upon previous learning, this unit demonstrates how to create presentations, which are adequate for the audience and the venue. Moreover, the presentations will be enriched with multimedia content to enrich the experience of the audience.

Throughout the unit, the learners will be making use of images. Hence image manipulation skills will also be conveyed during the delivery of the unit. This ensures that the images being used are adequate for the task and represent the message that the learner needs to convey.

With each unique file being created representing tens of hours of work, it is imperative that files are backed up properly. The final part of this unit deals with the various forms of data replication and will provide the learners with the possibility of implementing and testing their own backup strategy that fits their needs.

Learning Outcomes

On completion of this unit the student will be able to

- 1. Use a word processing application to manage complex documents.*
- 2. Present data visually and produce advanced outputs using a spreadsheet application.*
- 3. Use a presentation application to produce multimedia centric outputs.*
- 4. Use an image editing application to manipulate images.*
- 5. Analyse and implement a data replication strategy.*