



MCAST

MQF/EQF Level 3

AS3-01-21

Diploma in Applied Science

Course Specification

Course Description

This programme of study provides a strong grounding in fundamental science and technology principles, as well as an initial exposure to vocational science subjects related to health, environment, food and engineering industries. The learner will be able to understand the fundamental principles and laws of science, and how these are applied within the industrial sector. The learner will also be able to understand the science of different materials, and gain an awareness of the principles behind certain technologies.

Programme Learning Outcomes

At the end of the programme the students is able to

1. *Understand the impact of human activity on the environment.*
2. *Investigate forces, motion, energy, light, electricity and sound waves.*
3. *Describe the factors that can affect and control human health.*
4. *Identify chemical substances and organic compounds.*

Entry Requirements

MCAST Foundation Certificate

OR

2 SEC/O-Level/SSC&P (Level 3) passes from the following subjects: English Language, Mathematics, Physics, Chemistry, Biology, Design and Technology, Health and Social Care

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: 1500

Mode of attendance: Full Time

Duration: 1 Year

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 Ġhonoq 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, Ġhajnsielem

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 003 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 003 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	Semester
ASASC-306-1401	Energy and the Universe	6	YEAR
ASASC-306-1402	Application of Physical Science	6	YEAR
ASBIO-306-1601	Biology and Our Health	6	YEAR
ASCHM-306-2104	Chemistry and Our World	6	YEAR
ASCHM-306-1402	Chemical Analysis	6	YEAR
ASENV-306-1402	Monitoring the Environment	6	YEAR
CDKSK-304-1921	Mathematics	4	YEAR
CDKSK-304-1922	English	4	YEAR
CDKSK-304-1923	Malti	4	YEAR
CDKSK-304-2108	Information Technology	4	YEAR
CDKSK-304-2103	Community Social Responsibility	4	YEAR
CDKSK-304-1925	Science	4	YEAR
Total ECTS		60	/

ASASC-306-1401: Energy and the Universe

Unit level (MQF/EQF): 3

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

The aim of this unit is to enable the students to develop the knowledge and skills related to fundamental physical concepts, so that they can investigate energy transformation, radiation and their application as well as gain the knowledge of waves, how electrical energy is transferred for various applications and how our universe has evolved. The emphasis is given to the comparison of renewable and non-renewable sources of energy and how modern technology plays its part in harnessing renewable energy sources. Economic and environmental issues are also considered. Students will learn properties of waves (electro-magnetic spectrum), and radiation (alpha, beta, gamma) covering the aspects of usefulness and safety. On aspects of electricity, students will investigate how electrical energy is produced and transferred to homes and workplace. Finally, students will get the knowledge of components of the solar system and the ways the universe is changing.

Students should be able to investigate energy transformations that will be based on their knowledge of types, sources and ways of transformations of energy. This will enable the recognition of the sources of renewable and non-renewable energy, as well as personal efficient utilization of energy. Special focus should be on electrical energy and electric circuits. Knowledge of the properties and applications of waves and radiation will be based on the basic properties of electromagnetic waves and assigned frequency spectrum for specific application. The unit includes topics that refer to the solar system and the universe that should equip the students with additional knowledge and skills related to this area.

Learning Outcomes

On completion of this unit learners should be able to:

1. *Investigate properties of energy sources and principles of its transformations.*
2. *Apply concept and properties of waves and radiation.*
3. *Know the process of electric energy transformation from different sources to electric circuits at home and in industry.*
4. *Know the components of the solar system and the way the universe is changing.*

ASASC-306-1402: Application of Physical Science

Unit level (MQF/EQF): 3

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

This unit enables students to investigate how physics is used in various day-to-day applications focusing on the concepts of motion, forces, waves and electricity. At the end of course students should be able to construct and interpret distance-time graphs for constant speed and accelerated systems, relate force and motion, and consider friction and its influence on motion. Additionally, the learners should get knowledge about sounds production, pitch and loudness. Topics related to waves such as reflections and mirrors, refraction, optics and lenses should be acquired. Moreover, the understanding of electrical circuits including the Ohm's law will be attained by this unit. All learning objectives are to be accompanied and achieved by practical laboratory work.

Students should be able to understand, describe and construct different concepts of motion and forces, as well as what influences braking. This is to be achieved through an understanding and the knowledge of the equation used to calculate acceleration, the equation relating force, mass and acceleration, and the concept of reaction time. To understand the concept of resulting force and its interpretation, students should know that forces occur in pairs, be able to determine them, explain the resultant force in case of zero and non-zero. Knowledge of the basic concepts of optics should be achieved through an understanding of how a mirror image is formed and what its characteristics are, understand how a lens refracts light, describe lenses and images, use the magnification equation. Principles of sound production should be based on the sound production and an understanding of the relationship between the pitch of a sound and the frequency of a sound wave. Construction and interpretation of electrical circuits should be based on an understanding of the current, potential difference and resistance and the knowledge of how these are calculated when the components of circuit are in a series or parallel.

Learning Outcomes

On completion of this unit learners should be able to:

1. *Use different concepts of motion and forces.*
2. *Identify what influences braking.*
3. *Understand the concept of resulting force and its interpretation.*
4. *Understand the concepts of refraction and reflection and how lenses and mirrors function.*
5. *Know the principles of sound production.*
6. *Design and characterized electrical circuits.*

ASBIO-306-1601: Biology and Our Health

Unit level (MQF/EQF): 3

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

This unit enables the students to develop the knowledge and skills related to the fundamental concepts in biology. Students will investigate the living organisms, how humans affect the environment and the factors that affect human health. The students' technical skills will be developed along with their knowledge and understanding of biological techniques as they carry out practical investigations. In this unit students will gain knowledge of the wide variety of living organisms on the Earth and their classification, interactions between organisms and with the environment, basic structure of animal and plant cells and their functions, the role of DNA and the inheritance, the effect of biological factors on human health and how body responds to internal and external environmental changes.

The ability to investigate the functions of living organism will be achieved through the knowledge of a classification system and understanding of the relationships between living organisms as well as knowledge related to properties of genetic materials and processes of their modification and transferring. The knowledge of the factors which affect and control the human health should be based on understanding the causes and the prevention of diseases, social factors in community and STD (sexually transmitted diseases), as well as inherited factors and genetics.

Learning Outcomes

On completion of this unit learners should be able to:

1. *Investigate structures and functions of living organisms and their interactions.*
2. *Analyze the impact of human activity on the environment.*
3. *Identify the factors which influence human health.*
4. *Recognize human body reaction to environmental changes.*

ASCHM-306-1401: Chemistry and Our World

Unit level (MQF/EQF): 3

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

This unit enables the students to acquire the knowledge of fundamental chemistry concepts and the chemical effects of human and natural activities on environment. It covers the basics of chemistry: chemical classification - elements, compounds and mixtures. The unit includes investigation of procedures for safe use of chemicals within work setting. Additionally, students learn about chemical reactions in industrial use for the production of items for sale. Also, the procedures applied to maximise production of these items are considered. It also covers natural processes and chemical reactions which have changed the Earth. This unit is laboratory orientated. After getting to know laboratory apparatus, students will perform laboratory experiments in a safe manner. Students will deliver their reports using appropriate terminology and symbols.

Knowledge of physical properties of different types of chemical substances should enable the students to describe different classes of chemicals. This knowledge is a sound basis for their proper and safe applications. The ability to investigate the properties of the elements relating to their chemical structure should be illustrated with examples of the most common industrial processes. The physical and chemical processes that affect the Earth, as well as the factors that can influence the underlying chemical reactions will be interpreted to the students.

Learning Outcomes

On completion of this unit learners should be able to:

1. *Analyze physical properties of different types of chemical substances.*
2. *Investigate the properties of the elements related to their chemical structure.*
3. *Recognize the factors that influence the rate of chemical reactions.*
4. *Know the factors that are affecting the Earth and their environment.*

ASCHM-306-1402: Chemical Analysis

Unit level (MQF/EQF): 3

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

This unit enables students to develop the skills needed to detect and analyse a variety of chemical compounds. These skills are essential for work in the food, pharmaceutical, biochemical industry, pathology, environmental and forensic laboratories. The main areas of the unit cover chemical reactions and instrumental analysis. Students should be able to prepare simple solutions and measure pH using indicator papers and pH meters. Learners are skilled to recognise cations based on flame tests and the reaction with sodium hydroxide. Moreover, the unit enables learners to identify gases (hydrogen, oxygen, carbon dioxide), and recognise anions - carbonates, halides and sulphates. Instrumental analysis will cover chromatographic techniques, for which the principles will be explained on a visually accessible thin layer chromatography. All learning objectives are to be accompanied and achieved by practical laboratory work.

Students should be able to classify pH-based substances based on their knowledge of the pH definition and the ways of determining/measuring a pH. Recognition of lithium, sodium, potassium, calcium and barium should be achieved through the knowledge of specific reactions to cations (flame test). The understanding of sodium hydroxide reactions will be used for the identification of aluminium, calcium, magnesium, copper and iron. Students should learn how to follow procedures to underpin their knowledge of gas testing. The identification of carbonates, halides and sulphates should be based on the knowledge of specific tests. Understanding the principles of chromatography is to be achieved through the knowledge of principles and experimental work.

Learning Outcomes

On completion of this unit learners should be able to:

1. *Classify substances based on pH.*
2. *Determine the presence of lithium, sodium, potassium, calcium and barium based on flame tests for cations.*
3. *Estimate the presence of aluminium, calcium, magnesium, copper and iron by their reaction with sodium hydroxide.*
4. *Carry out tests for hydrogen, oxygen, and carbon dioxide.*

5. *Identify the presence of carbonates, halides, sulphates by conducting specific tests.*
6. *Understand the principles of chromatography.*

ASENV-306-1402: Monitoring the Environment

Unit level (MQF/EQF): 3

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

The aim of this unit is to enable students to investigate key environmental concepts, to develop the skills needed to monitor ecosystems and to know how various agencies work to protect the environment. Students will study how the components of the ecosystem function by interrelating with each other to maintain balance. They will then consider how this balance may be affected by human activities which result in various forms of environmental pollution and the generation of excessive waste. By knowing how ecosystems function and the effect of human influence, students should have a better understanding of the outcome of their practical investigation. Students will acquire the knowledge of the techniques for the monitoring of ecosystems and measuring influences of carbon dioxide, benzene, acidity etc. Additionally, this unit develops the vocational practical skills of the learners in order to work safely and competently in any relevant environmental setting or laboratory. They will also be familiar with regulative related to the environmental issues, i.e. environment legislation to provide protection of the environment.

Learning Outcomes

On completion of this unit learners should be able to:

- 1. Analyze the structure and the operation of an ecosystem.*
- 2. Investigate influence of the human activities on ecosystems.*
- 3. Employ techniques involved in the monitoring of ecosystems.*
- 4. Apply regulations related to environmental protection.*

ASCHM-306-2104: Chemistry and Our World

Unit level (MQF/EQF): 3

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

This unit is composed of three major thematic areas:

1. Fundamental chemistry concepts.
2. The chemical effects of human and natural activities on environment.
3. Procedures for safe use of chemicals within a workplace setting.

Fundamental chemistry concepts include: chemical classification - elements, compounds and mixtures, the periodic table; chemical reactions - equations, rates of reaction, factors affecting reactions; chemical properties - relation to the periodic table, atomic structure.

The chemical effects of human and natural activities on environment include: natural processes and chemical reactions which have changed the Earth; chemical reactions in industrial use for the production of items for sale; the procedures applied to maximise production of these items.

Procedures for safe use of chemicals within work setting include: the investigation and practice of basic laboratory procedures; learning the safe handling of chemicals within the work setting.

This unit is laboratory orientated. After getting to know laboratory apparatus, learners will perform laboratory experiments in a safe manner. Learners will deliver their reports using appropriate terminology and symbols.

Knowledge of physical properties of different types of chemical substances should enable the learners to describe different classes of chemicals such as elements (including metals and non-metals) and compounds (including both ionic and covalent compounds). This knowledge is a sound basis for their proper and safe applications. The ability to investigate the properties of the elements relating to their chemical structure should be illustrated with examples of the most common industrial processes. The

physical and chemical processes that affect the Earth, as well as the factors that can influence the underlying chemical reactions will be interpreted to the learners.

Learning Outcomes

On completion of this unit learners should be able to:

1. *Analyze physical properties of different types of chemical substances.*
2. *Investigate the properties of the elements related to their chemical structure.*
3. *Recognize the factors that influence the rate of chemical reactions.*
4. *Know the factors that are affecting the Earth and their environment.*

CDKSK-304-1923: Malti

Unit level (MQF/EQF): 3

Credits: 4

Delivery Mode: Face to Face

Total Learning Hours: 100

Daħla

L-ilsien huwa essenzjali fl-iżvilupp intellettuali, emozzjonali u soċjali ta' kull individwu. Il- Malti mhux biss jiġbor fih identità lingwistika u kulturali iżda huwa għodda ta' komunikazzjoni u interazzjoni. Permezz ta' l-ilsien Malti l-individwu jista' jesprimi dak kollu li jhoss u jkun kreattiv fil-messaġġ li jrid iwassal filwaqt li jkun espost għal oqsma oħra ta' taġħlim. Il-Malti huwa lsien ħaj li ssawwar mill-poplu Malti u għadu qiegħed jissawwar biex jibqa' għodda ta' kreattività għal kull min jużah.

L-Għanijiet

Biex l-istudenti jiksibu din l-unità jridu juru li kapaci:

1. Jifhmu diskors standard li wieħed juża u jiltaqa' miegħu fil-ħajja ta' kuljum, kif ukoll jifhmu suġġetti marbuta ma' grajjiet kurrenti u suġġetti personali u ta' interess professjonali u vokazzjonali.
 2. Jifhmu testi li jikkonsistu f'diskors użat fil-ħajja ta' kuljum u fid-dinja tax-xogħol filwaqt li jifhmu deskrizzjoni ta' avvenimenti, fehmiel u opinjonijiet permezz tal-qari.
 3. Jaffrontaw sitwazzjonijiet f'kuntest ta' konverżazzjoni u jikkellmu fuq suġġetti li huma familjari jew ta' interess personali kif ukoll marbuta mad-dinja ta' kuljum u l-qasam tax- xogħol.
 4. Jiformolaw testi fuq suġġetti li huma familjari għalih u ta' interess personali u vokazzjonali b'mod preċiż u relevanti f'dak li għandu x'jaqsam mal-lingwa Maltija.
1. Jħaddmu ħiliet varji għal skop ta' taġħlim, li jmorru lil hinn mil-lingwa.

CDKSK-304-1922: English

Unit level (MQF/EQF): 3

Credits: 4

Delivery Mode: Face to Face

Total Learning Hours: 100

Unit Description

This unit is targeted at learners proceeding from a Level 2 vocational programme (therefore taking into account completion of Level 2 Key Skills English) as well as those whose entry level is directly at Level 3.

In line with the Malta Qualifications Framework for Level Descriptors, English for Diploma Programmes takes into account the learning of English in terms of knowledge, skills and competences. Knowledge seeks to assess recognition of facts, principles and general concepts in a field of work or study, while skills assess the application of that knowledge in the accomplishment of tasks by employing basic methods, materials and information. In turn, competences empower the learner by giving him/her full responsibility for their accomplishment.

At Level 3, learners are expected to have sufficient knowledge of English in order to deal with everyday situations in scenarios ranging from home, work, social and public settings. General emphasis is laid on work and public settings. In their application of this knowledge, learners are required to listen to or read a range of short texts of a technical and non-technical nature, as well as information broadcast through the popular media. General understanding as well as association of ideas and inference of meaning are expected at this level. Learners should be capable of communicating in English by discussing familiar topics or vocational topics previously exposed to.

This unit encourages learners to combine their technical knowledge with their growing knowledge of general English. They will be introduced to specialised vocabulary related to their area of vocational interest: to materials and their properties, equipment and its usage, processes, tools, devices, customer service and item servicing and general workshop/laboratory practice. In addition, learners are expected to be able to write and produce short but effective work-related memoranda, personal letters, letters of application and curriculum vitae. Writing practice will be contextualised according to the various exigencies of the various institutes.

Learning Outcomes

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

1. *Listen to and understand information obtained from a media source.*
2. *Identify and comprehend information presented textually in vocational and technical contexts.*
3. *Identify, comprehend, and interpret information presented visually.*
4. *Speak and communicate ideas effectively on a range of topics ranging from the personal to the technical/vocational.*
5. *Write short, work-related correspondence in the form of memoranda, letter of application and curriculum vitae.*
6. *Research and organise information for extended technical/vocational writing.*

CDKSK-304-1921: Mathematics

Unit level (MQF/EQF): 3

Credits: 4

Delivery Mode: Face to Face

Total Learning Hours: 100

Unit Description

This unit aims to develop the mathematical knowledge and skills required to apply mathematics in real-life situations. The student should be given the opportunity to engage in problem solving by: *(i)* exploring different approaches to solve a given problem; *(ii)* using appropriate strategies and language to arrive to a solution; and *(iii)* checking the validity and accuracy of the solution. The interconnectivity between different areas of mathematics should be pointed out to the student, even though some areas might require different techniques and tools (including ICT tools). The use of (scientific) calculators and ICT can be integrated in the delivery of the topics listed hereunder. The student should also be helped to develop and appreciate mathematical reasoning and deductive skills by being exposed to short proofs.

By the end of this unit, the student should demonstrate readiness and competency to independently apply mathematical techniques in solving problems, and be able to communicate findings using appropriate mathematical vocabulary and rigour.

These problems will involve:

- (a) numerical calculations,
- (b) algebraic manipulation,
- (c) geometrical properties,
- (d) basic statistical analysis
and
- (e) probabilistic
techniques.

Learning outcomes

To achieve this unit, the student must be able to:

1. *Compute further numerical calculations.*
2. *Construct and manipulate formulae and algebraic expressions.*
3. *Construct linear equations using graphical techniques.*
4. *Apply geometrical properties of lines, shapes and solids to find lengths, angles, areas and volumes.*

5. *Summarise statistical data both graphically and numerically.*
6. *Determine the probability of single events and of the combination of independent events.*

CDKSK-304-2108: Information Technology

Unit level (MQF/EQF): 3

Credits: 4

Delivery Mode: Face to Face

Total Learning Hours: 100

Unit Description

This unit aims to develop basic computer knowledge and skills needed in real-life situations. In a supportive environment, the learner will be challenged to understand how to use various real-life applications belonging to a productivity suite with the aim of providing to our learners the necessary skills required to use common computer applications necessary during their studies. By the time learners complete this unit they will be increasingly independent users of personal computers and will have a broad understanding of how ICT can help their learning, their work, and their social life. They will have a well-developed ability to decide when and how to use ICT and will be aware of the limitations associated with this use.

Through this unit the learners will achieve a broad knowledge of ICT and will be able to use ICT to carry out several increasingly complex tasks. They will be competent in using word processing, spreadsheet, and presentation software to create, format and finish documents, workbooks and slide shows that contains various elements. Finally, this unit also introduces the use of online communities and online tools to build and maintain an online presence.

Learning outcomes

To achieve this unit, the student must be able to:

1. *Use a word processing application to create everyday letters and documents.*
2. *Use a spreadsheet to produce accurate work outputs.*
3. *Use presentation software.*
4. *Utilise online collaboration tools.*
5. *Use internet presence management tools.*

CDKSK-304-1925: Science

Unit level (MQF/EQF): 3

Credits: 4

Delivery Mode: Face to Face

Total Learning Hours: 100

Unit Description

In this Level 3 key skill, learners will increase their awareness about the importance of science in our everyday life. The focus will be on natural sciences, mainly the three different areas; the living world, the physical world and the world of technology.

The focus of the living world will be on interactions between living organisms in a given environment, the dependence of animals on plants for their survival via food chains and food webs, and human life. Topics related with human life will include the position of the main body organs, anatomy and physiology of at least two organ systems, and physical health (importance of healthy food, clean water and unpolluted air; importance of balanced diet and regular exercise for physical and emotional well-being; adverse effects of drugs, alcohol and smoking; ways to avoid contamination of bacteria and viruses; role of white blood cells and misuse of antibiotics).

As part of the physical world, the learner will be more familiar with physical properties of materials, classifying objects and materials based on their physical properties, and linking the uses of objects and materials with their physical properties. Furthermore, they will enhance their knowledge on renewable and non-renewable sources of energy, using sources of energy in the immediate environment safely and economically, and energy-saving measures that can be applied at home and at work.

Related with the world of technology, the learners will discuss health and safety issues at home and in the workplace including recognising situations of risk and ways how one can avoid accidents. Also, the learners will familiarise themselves with issues related to costs and efficiency of everyday life processes by carrying out an analysis of a particular process or task in terms of energy and efficiency.

Learners will enhance their investigative skills via a project (which includes a site visit designed specifically for different institutes) in collaboration with BirdLife Malta. During a training session, lecturers will be given teaching resources and suggestions for sites to deliver the field teaching aspect and project themes. Via this learning outcome, the learner will be empowered to take action to develop a project that addresses an environmental issue. S/he will have to analyse the data, interpret and evaluate findings

and then communicate them to their colleagues. The learner should realise that everyone can do something which will make a difference and that action can take place not only at the personal level but also at other levels such as community, national and international levels. Learners should understand ecosystem services and recognise that they can be used in all careers to save time, money, resources etc. but that they need to be respected for this to be possible.

Learning Outcomes

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

1. *Observe and classify objects in the immediate environment*
2. *Link scientific knowledge with everyday life situations*
3. *Research local environmental issues and use problem solving skills to investigate sustainable solutions*
4. *Use scientific knowledge to improve everyday life*

CDKSK-304-2103: Community Social Responsibility

Unit level (MQF/EQF): 3

Credits: 4

Delivery Mode: Face to Face

Total Learning Hours: 100

Unit Description

This key skill presents the opportunity for MQF level 3 learners to explore their individual self through the analysis of their core values and behavioural tendencies. This will bestow insight upon the learners, which will assist them in setting and/or recalibrating their future goals. Through the acquisition of different life skills, learners will be empowered to explore their surroundings and become more responsible towards the environment which hosts them. Delving into what constitutes responsibility towards others, the learners will be presented with the opportunity to recognise the significance of developing an adequate personal conduct. The learners will also be presented with opportunities to develop and/or hone their management and organisational skills, which in return will assist them in becoming more employable and independent. Through the completion of a compulsory community work experience, learners will recognise the benefits of self-management skills towards the acquisition of balance within one's lifestyle. The completion of the compulsory community work project will also present the ideal opportunity for the students to analyse their experience, evaluate their own performance and also generate suggestions and recommendations for future good practices.

Learning Outcomes

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

1. *Examine the relation between personal core values and goal setting.*
2. *Practice organisational skills to establish further independence.*
3. *Identify the practice of proper personal conduct and communication within different communities.*
4. *Evaluate the engagement in a community work experience.*