



**MCAST**

**MQF/EQF Level 4**

**AG4-03-22**

**Advanced Diploma in Horticulture**

**Course Specification**

## **Course Description**

This programme of study provides learners with an understanding of the horticultural industry including crop management of a wide range of crops, an introduction to garden design, floristry, pest and nutrient management, and studies in rural development and agricultural policies. The programme of study offers a wide perspective on the latest technologies used in the agricultural sector as well as its interconnectivity with entrepreneurship and business and the hospitality sector in relation to garden design and agri- and ecotourism. Learners will be encouraged to relate theory to practice at all stages of learning through assignments, projects and practical work. Scheduled practical crop husbandry duties form an integral part of the curriculum.

## **Programme Learning Outcomes**

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

- 1. Understand a number of scientific and technical aspects in the subject-areas chosen.*
- 2. Understand the anatomy, physiology, behaviour and health issues related to plants.*
- 3. Undertake work-related experience and practical work in the land-based sector.*
- 4. Develop business ideas and carry out investigative projects in the land-based sector.*

## **Entry Requirements**

Any MCAST Level 3 Diploma

OR

4 SEC/O-Level/SSC&P (Level 3) passes

## 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<br>Third Cycle Bologna Process  | NA                                       | NA                       |
| Level 7              | Masters<br>Second Cycle Bologna Process   | 90-120                                   | Less than 30             |
|                      | Post-Graduate Diploma   | 60                                       |                          |
|                      | Post-Graduate Certificate   | 30                                       |                          |
| Level 6              | Bachelor <sup>23</sup> /Bachelor (Hons.) <sup>24</sup><br>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 <sup>25</sup>   | 60-120                                   |                          |
| Level 4              | Pre-Tertiary Certificate  | 30                                       | Less than 120            |
|                      | VET Level 4 Programme <sup>26</sup>   | 120                                      |                          |
|                      | MATSEC Certificate  | NA                                       |                          |
| Level 3              | VET Level 3 Programme <sup>27</sup>   | 60                                       | Less than 60             |
|                      | General and Subject Certificate   | NA                                       |                          |
| Level 2              | VET Level 2 Programme <sup>28</sup>   | 60                                       | Less than 60             |
|                      | General and Subject Certificate   | NA                                       |                          |
| Level 1              | VET Level 1 Programme <sup>29</sup>   | 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, 4<sup>th</sup> 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+

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 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 though an online form by providing proof of identification and basic data. Once the identity is verified and the account is

created the candidate may proceed with the online application according to the same instructions applicable to all other candidates.

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

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

*Contact details for requesting further information about future learning opportunities:*

**MCAST Career Guidance**

Tel: 2398 7135/6

Email: [career.guidance@mcast.edu.mt](mailto:career.guidance@mcast.edu.mt)



## Current Approved Programme Structure

| Unit Code         | Unit Title   | ECTS       | Year     | Semester |
|-------------------|--|------------|----------|----------|
| ASHRT-406-1504    | Introduction to Fruticulture and Vegetable Production                          | 6          | 1        | YEAR     |
| ASANM-406-2203    | Apiculture   | 6          | A        | YEAR     |
| ASANM-406-2201    | The Food Chain and the Rural Environment                                       | 6          | A        | YEAR     |
| ASANM-406-2210    | Environmental Science  | 6          | A        | YEAR     |
| ASHRT-406-1502    | Garden Design Principles   | 6          | A        | YEAR     |
| ASHRT-406-1503    | Integrated Nutrient Management   | 6          | A        | YEAR     |
| ASHRT-406-1506    | Plant Biology and Genetics   | 6          | A        | YEAR     |
| ASHRT-406-2201    | Water Quality and Irrigation   | 6          | A        | YEAR     |
| CDKSK-406-2001    | English  | 6          | A        | YEAR     |
| CDKSK-406-2109    | Information Technology   | 6          | A        | YEAR     |
| ASPRT-000-2203    | Practical I*   | N/A        | 1        | YEAR     |
| ASWBL-406-2201    | Work Related Experience  | 6          | 2        | YEAR     |
| ASANM-403-2204    | Agriculture Marketing and Agritourism  | 3          | B        | YEAR     |
| ASFDD-406-1501    | Food Processing: Cottage Industry and Fermentation                             | 6          | B        | YEAR     |
| ASHRT-406-1501    | Rural Sociology, Topography and Structures                                     | 6          | B        | YEAR     |
| ASPRJ-409-1803    | Undertake An Extended Investigative Project in the Land- and Sea Based Sectors | 9          | B        | YEAR     |
| ASHRT-409-1505    | Pest and Diseases Management   | 9          | B        | YEAR     |
| ASHRT-409-2202    | Cut Flower Production and Flower Arrangement                                   | 9          | B        | YEAR     |
| ASHRT-406-1509    | Field Crop Planning and Production: Solanaceage, Cucurbits and Strawberries    | 6          | B        | YEAR     |
| CDKSK-404-1915    | Employability and Entrepreneurial Skills                                       | 4          | B        | YEAR     |
| CDKSK-402-2104    | Community and Social Responsibility  | 2          | B        | YEAR     |
| ASPRT-000-2204    | Practical II*  | N/A        | 2        | YEAR     |
| <b>Total ECTS</b> |  | <b>120</b> | <b>/</b> | <b>/</b> |

\* Learners following this programme need to also follow a practical component which is not accredited. This is assessed on a pass/fail basis, and is also shown on the final transcript.

This course will be delivered on a back to back system.

# **ASHRT-406-1504: Introduction to Fruticulture and Vegetable Production**

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

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## **Unit Description**

The intensive production of fruit and vegetables on commercial horticulture units is an important part of reducing the reliance of imported produce. It offers career opportunities and employment in both the growing industry and ancillary suppliers. This introductory unit provides the foundation for students entering the industry as well as those who may wish to continue with further studies.

The unit aims to bring together the underlying principles of crop production, with the practical applications as seen through local enterprises and other resources which will enrich the learners understanding.

Investigations of factors to consider in relation to selection of an appropriate site for specific fruit or vegetable crops are undertaken, followed by identification of facilities and resources required for the enterprise to function.

The principles of raising plants from seed either directly drilled in the field or through transplanting of modules are discussed.

A wide range of growing systems for vegetables are examined and the choices of vegetable varieties are discussed and related to the needs of all year round production, seasonality, floating mulches, irrigation and nutrient requirements, weed, pest and disease control.

The unit then considers the production of both soft and top fruit. Examination of the benefits of using certified stock for planting and the importance of correct rootstock selection for top fruit are considered.

Orchard planting and training systems are evaluated as are relevant pruning techniques.

Finally, the unit explores the requirements for successful harvesting, preparation for storage, storage techniques, packaging and the preparation of produce for the market.

## Learning Outcomes

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

1. *Explain the importance of site selection and crop choices for successful crop cultivation.*
2. *Explain the principles of vegetable crop production.*
3. *Explain the principles of fruit crop production.*
4. *Identify the requirements for the harvesting, storage and preparation for market, of fruit and vegetables.*

## ASANM-406-2203: Apiculture

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

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### Unit Description

The purpose of this unit is to enable learners to develop skills of analytical thinking and scientific enquiry. Learners will gain an understanding of apiculture and will be able to apply these skills when considering the applications of beekeeping in our lives. The approach of this unit is to not only provide knowledge to the learners but also teach the learner problem solving and investigation skills. The Apiculture unit covers the main areas of understanding bees, their physiology and anatomy, pest and diseases that affect bees and why bees swarm. Learners who complete this unit will be able to draw on the knowledge and understanding of the key areas of apiculture and apply the skills of scientific enquiry to practical investigation.

This unit is relevant to learners aspiring to further advance their knowledge of bees and beekeeping. Learners are encouraged to research current apiculture issues and thus develop their scientific literacy. On completion of the unit, learners will appreciate how the bee colony functions, the threats to their survival, swarming triggers and swarming prevention, the types of bee products and the functional anatomy of these insects.

### Learning Outcomes

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

1. *Explain how bee colonies function.*
2. *Describe the bee's anatomy and physiology.*
3. *Discuss how to protect bee colonies from pests and diseases.*
4. *Analyse bee swarming and preventive measures for bee colonies.*
5. *Appraise the process used for the rearing of queen bees.*
6. *Use established protocols in bee products production.*

## **ASANM-406-2201: The Food Chain and the Rural Environment**

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

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### **Unit Description**

This unit gives the learner a thorough overview of the various aspects surrounding the food production processes. It starts by exploring the different linkages of the food supply chains and the implications that these have on aspects related to quality and hygiene. This foundational knowledge will be used in the next section of this unit which delves upon the main trends related to food supply at the global and local scales, and hence, gives the learner the context within which a player in the food chain finds itself.

The environmental dimension of the food chain will be subsequently discussed with emphasis placed on food production trends- organic agriculture and permaculture- which seek to focalize on reducing the impact and footprint of the production of food. The last part of this unit will provide the learners with the necessary skills to contribute to a very important aspect of agriculture-related landscape and environmental stewardship- the building and restoring of rubble walls.

### **Learning Outcomes**

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

- 1. Illustrate the complex and dynamic nature of the food supply chain and the sensitivity surrounding food quality, hygiene, and safety in different areas.*
- 2. Explain the main trends and issues in food supply and demand on a global and local scale.*
- 3. Explain the principles of Organic Agriculture and Permaculture.*
- 4. Build a rubble wall or other specified rural structure.*

## **ASANM-406-2210: Environmental Science**

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

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### **Unit Description**

The aim of this unit is to stimulate analytical thinking and develop skills for scientific inquiry that will provide the learner with a good understanding of the environment. Learners will understand the importance of how the different environmental systems interact and the implications of the environment on human society. The Environmental Science Unit is to be approached with the learner exercising problem solving and developing their investigation skills.

The Environmental Science Unit covers the main environmental topics of ecology, climate change, nutrient cycles and biodiversity. Learners are encouraged to research environmental issues and so develop their scientific literacy. Furthermore, learners need to practice communicating their research findings and thus develop their presentation skills.

Learners who complete the Environmental Science Unit will be able to utilise their understanding of the main principles of environmental science and apply the scientific skills learnt. In addition, learners will be able to draw on their environmental knowledge to develop and undertake practical investigations.

In this unit, learners are to apply the environmental principles learnt to selected local contexts in order to complete the assessment tasks. In the Climate area of study, learners choose a particular greenhouse gas to research further and compile a mini presentation, narrating how their local climate is, or could, be affected. Likewise, with the Nutrient Cycle area, learners are to choose one cycle from which to research a particular aspect. Learners must demonstrate their knowledge of biodiversity threats by selecting a threatened animal in the region they live and present the underlying principles behind the threat and solutions to prevent the loss of this animal.

## Learning Outcomes

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

1. *Explain general ecological principles showing how organisms interact with their environment.*
2. *Show how climate change is affected by mankind in order to prevent further harm.*
3. *Explain how nutrient cycles function and their impact on the environment.*
4. *Appreciate the complexities of biodiversity for managing ecosystems.*

## ASHRT-406-1502: Garden Design Principles

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

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### Unit description

This unit aims to provide learners with an understanding of the procedures, processes and principles of garden design and how these are applied in practice.

This is achieved through learners undertaking real site based design projects and industrial based design activities. They will also be asked to reflect on the theory of their own developing design solutions (and those of others) through formative design critiques, tutorials and reviews. These design activities will allow learners to develop a clear understanding of the main stages of the design process and the applied use of creative principles required to develop competent garden designs.

This unit will give learners the knowledge and skills required to follow a design process; e.g. identify the requirements of the client brief, undertake site investigations identifying issues and potential solutions, develop design ideas and concepts, apply creative design principles via interim sketch designs including the application and choice of hard and soft landscape materials, produce final designs layouts and communicate ideas by producing plans and visualisations. In developing this knowledge and skills, learners will investigate and apply the elements and principles of creative design practice. These include:

- Embracing design elements such as line, shape, form, geometry, colour, texture;
- Utilising spatial design tools such as masses & voids, form & space, scale and proportion;
- Exploring composition principles such as Order/Balance/Proportion, Harmony/Unity, Movement/Flow, Rhythm/ Repetition/Transition;
- Developing real designs by converting creative theory and ideas into working solutions through the choice of hard and soft landscape materials.

While the unit focuses on developing the learners garden design abilities, it also intends to provide horticulturalists with the applied language tools that will enable them to confidently communicate about the design process and design issues with other professions within the landscape industries, e.g. contractors, nurseries, landscape designers. Having strong design communication skills is also becoming more important as the public become increasingly informed and aware about aspects of their green environment, quality landscapes and the need for good design.



On completion of this unit learners will be able to produce and present a range of simple plans and visualisations and communicate the process, ideas and designs.

## **Learning Outcomes**

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

- 1. Demonstrate the use of different stages of a design process as applied to garden design;*
- 2. Apply the elements and principles of design as they relate to garden design;*
- 3. Identify the requirements of a range of plants used in landscaping;*
- 4. Apply verbal and graphic techniques to communicate a garden design projects utilising design plans, images and visualisations.*

## **ASHRT-406-1503: Integrated Nutrient Management**

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

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### **Unit Description**

This is a management skills based unit and will demonstrate the learner's abilities to analyse and evaluate plant nutrient needs in relation to soil fertility by developing an understanding of optimising of all sources of organic, inorganic and biological components in order to benefit higher productivity in a sustained, integrated management system.

The learner will demonstrate an understanding of key concepts, determinants and advantages of managing nutrients for maintenance of productivity sustainably. The unit is relevant to learners wanting to further enhance their knowledge of nutrient supply management as applied to horticultural practices. On completion of the unit learners will understand the need for and how future productivity must be managed and how resources should be utilised efficiently and effectively.

Learners will carry out soil testing and analysis for evaluation of nutrient assessment and be able to research effectively in order to plan for sustainable plant production. Learners will also gain skills in presenting and in feasibility and gain confidence in applying integrated management principles.

Learners will gain underpinning knowledge and understanding of the key issues and importance of sourcing and utilising variable plant nutrients and how these affect plant growth and development. The learners will also gain a broad knowledge of edible mushroom production.

### **Learning Outcomes**

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

- 1. Evaluate the use of Integrated Nutrient Management in maintenance and adjustment of soil fertility and plant nutrient supply for sustainable crop production.*
- 2. Plan effective and efficient management of plant nutrient supply in optimising plant productivity.*

3. *Analyse diverse sources of plant nutrients to check nutrient maintain soil health and productivity.*
4. *Explain edible Mushroom production and management.*

## **ASHRT-406-1506: Plant Biology and Genetics**

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

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### **Unit Description**

The biological principles that operate in the growth and development of plants is an essential knowledge for students wishing to embark on a career in plant and crop production in horticulture.

By understanding the structure and activity of living processes in plants, an effective approach to critical production management decisions can be taken, thereby enhancing the prospect of commercial success.

This unit will provide the basis for an appreciation of the requirements for plant and crop production and the principles and practice of commercial plant and crop production and the application of genetics in crop improvement.

The unit will progress from an introduction to the plant cell, describing its principal structural characteristics and the organelles and other sub cellular components that undertake important life processes. Cellular reproduction by mitosis will be studied and the differentiation of new cells into tissues will be explored in relation to plant requirements for transport systems, support, water and nutrient uptake, photosynthesis and storage tissue.

Studies of plant organs will include the anatomy and morphology of the plant stem, the root, reproductive organs (both sexual and vegetative), and the leaf.

Physiological processes will be studied, in particular photosynthesis and water relations as well as phytohormone control of relevant processes such as ripening of harvestable plant parts.

The basic principles of genetics including selection and breeding techniques will be studied in relation to requirements for crop production, using examples of successful advances in a variety of appropriate crop types. Conventional and novel approaches to crop genetic management will be examined in their potential contribution to increased crop performance.

## Learning Outcomes

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

1. *Describe the structural and physiological basis of plant growth and development.*
2. *Appreciate the process of plant reproduction in relation to crop production.*
3. *Explain and utilize knowledge of plant physiology as the basis of input management of plants and crops.*
4. *Explain plant and crop improvement techniques, interpret varietal descriptions and appreciate the potential for future enhanced crop production from modern biotechnological techniques.*

## **ASHRT-406-2201: Water Quality and Irrigation**

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

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### **Unit description**

This is a theory and skills-based unit which prepares learners to be able to sustainably source clean irrigation water, design a suitable irrigation and storage system, and to apply water to crops at the correct time and rate, in order to optimise production.

It explains the importance of providing unpolluted water to crops for quantity and quality improvement and allows learners to understand the effects of various water contaminants, and how they can be prevented from entering water sources, within the context of local legislation and practice to protect agricultural and horticultural water supplies.

This unit covers the variation in water quality (physical, chemical and biological parameters), how this is affected by the water source and how this affects its use for irrigation.

It describes the importance of useable water to plants by discussing its function in crop structure, biochemistry and transport, as well as discussing its effect on quantity and quality of marketable production.

The unit allow learners to practice the measurement or calculation of soil moisture deficit and explains the concept of “scheduling” so that water is used most effectively. Schedules for individual crops will then be dealt with in the field crop planning units.

Learners will design and cost an irrigation supply system for a real farm, field or garden as part of the learning and assessment process. This exercise will include zoning, storage, delivery and application of irrigation water, as well as discussing routine maintenance and upkeep.

## **Learning Outcomes**

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

- 1. Discuss the movement of water in the soil and in the plant*
- 2. Examine the quality and sustainability of different water sources*
- 3. Design a cost-effective irrigation system*
- 4. Formulate an irrigation schedule using deficit calculations*

## **ASANM-403-2204: Agriculture Marketing and Agritourism**

Unit Level (MQF/EQF): 4

Credits: 3

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 75

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### **Unit description**

This unit introduces learners to key concepts and functions of 'Marketing' as they apply to the tourism sector and in specific Agri-tourism. This unit is divided into two key areas - Agricultural Marketing and Agri-tourism: The first focuses on the concept of Marketing and elements of the Marketing (principals) and provides the learner with a knowledge base in relation to marketing and its application to business and agri-business. The second key area focuses on multi-functional agricultural and agri-tourism and provides the learner with an understanding of agricultural diversification and agri-tourism with specific focus on Malta.

### **Learning Outcomes**

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

- 1. Describe the key elements of marketing*
- 2. Outline marketing principles in relation to Agri-business marketing*
- 3. Evaluate the potential of multifunctional agriculture in the Maltese Islands*
- 4. Explain the importance of agri-tourism to the different stakeholders*



# ASFDD-406-1501: Food Processing: Cottage Industry and Fermentation

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

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## Unit Description

For decades before the medieval period, and for years later, people in different parts of the world used a selection of approaches to preserve foods for later consumption at a time when there was no electricity to refrigerate food.

This unit provides an understanding of the main Cottage Foods that learners can make in the kitchen of their home residences. Not all food prepared domestically can be vended as Cottage Foods. They must be safe and non-hazardous foods products that do not need temperature and/or time controls to remain safe for consumption. The unit is relevant to learners wishing to further their knowledge of traditional food preservation methods, principles and shelf-life control and stabilisation.

Drying, pickling, curing, salting, sugaring, canning and fermenting are all techniques that have been essential activities throughout history aiming at killing or inhibiting the growth of microorganisms prolonging the shelf-life of the product.

This unit will explore how each of these techniques work, benefits, and limitations of food safety and quality perspective. It will also provide to students a step-by-step guideline on how to process and produce the products themselves. The unit will also be introducing the learner to various bee products and the benefits of the amazing discovered by scientists.

Finally, students should have the underpinning knowledge and understanding to make food using all the main traditional preservation method.

## Learning Outcomes

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

1. *Discuss principals and importance of food preservation.*
2. *Evaluate the technical and practical skills in many aspects of the Cottage Industry and Prepare food in a hygienic way.*
3. *Evaluate the role of fermentation microorganisms in major food fermentations.*

4. *Discuss the different bee products and related benefits.*

## **ASHRT-406-1501: Rural Sociology, Topography and Structures**

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

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### **Unit Description**

This unit revolves around the ‘making of the landscape,’ and an exploration of the various influences which have led to many turning points in Maltese agricultural history. Agriculture is a large scale land use and over centuries has resulted in an array of rural transformations across Europe. Landscape is a broad term and can incorporate an assemblage of physical attributes including rural landforms and structures and is a result of the interaction between nature and culture. The Maltese rural environment remains largely dominated by agriculture, however in the present day, the contribution of agriculture to the local economy is modest. Nevertheless, agriculture contributes to the local rural character, and the geomorphology of the Maltese Islands has resulted in various topographic features that contribute to the diversity of the landscape. Various military structures, archaeological features and sites exist, as well as the prominence of traditional rubble walls surrounding agricultural fields. Each landscape is a result of the superposition of different layers of changes that have occurred at different points in time. The Maltese landscape is unique in its physical structure, reflecting the diverse settlement patterns and urban forms introduced over various centuries. The traditional function of rural settlements is agrarian, however this is changing with the reduction in the focus on agriculture in rural areas and the introduction of residential and industrial uses not related to agriculture.

This unit explores the relationship between rural structures and agrarian community settlements and practices. It begins by investigating the structure and characteristics of Maltese rural communities; gaining an overview of their current role and function in the rural economy, in addition to a focus on the contrast between rural and urban land cover and use across the Island. The content then moves on to an exploration of the main features and structures of the rural environment in Malta, including common archaeological heritage, the significance of old farmhouses and rural structures, and a focus on geological features, focusing specifically on quarrying activities. From this, students will be encouraged to make connections between existing rural structures and the past activities and characteristics of agrarian societies. This will include an investigation of the ongoing interaction between rural communities and the environment, and a look at current threats and subsequent policies that are in place to protect rural structures. The unit subsequently focuses on the specific role of agriculture in Malta’s history, and its trajectory in terms of its shifting position in the

rural economy. Students will gain an overview of the history and development of agrarian communities from earliest evidence (7<sup>th</sup> Century BC) to the present day. Alongside this, students will also learn about the main drivers of the agricultural trajectory in Malta, including the influence of policies, such as the CAP and the European Landscape Convention, and international demands. Finally, the unit will include an introduction into the construction of a rubble wall (or other specified rural structure); investigating various forms and styles of rural structures.

## **Learning Outcomes**

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

- 1. Outline the history and development of agrarian communities in Malta, describing their current structure, characteristics and occupation.*
- 2. Identify how the main structures of the Maltese rural environment reflect the underlying topography and past land uses and practices of agrarian societies.*
- 3. Establish how agriculture has played a fluctuating role in Malta's history, and review the factors and events that have affected Malta's agricultural trajectory.*
- 4. Build a rubble wall (or other specified rural structure) and undertake a risk assessment of the rubble wall building process.*

## **ASPRJ-409-1803: Undertake an Extended Investigative Project in the Land and Sea-Based Sectors**

Unit Level (MQF/EQF): 4

Credits: 9

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 225

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### **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?”

Projects are characterised by four features: a group of people, a goal, limited time and money, and a certain level of uncertainty regarding whether the goals will be achieved. Project managers are involved with all of these aspects. Supervising and directing a project is thus anything but an easy task.”

The aim of this study unit is to train learners in all the processes involved in proposing and undertaking an extended investigative project in the land- or seabased sector. The learners should be able to conduct a literature review, compile a proposal, identify, plan, carry out an investigative project, and evaluate and present the results of the project.

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 a topic area that interests them and is relevant to their field of study.

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. *Conduct a literature review related to the land- or sea-based sector.*
2. *Write a proposal for an investigative project in the land- or sea-based sector.*
3. *Design and produce a detailed plan for an investigative project in the land- or sea-based sector.*
4. *Construct an investigative project in the land- or sea-based sector and monitor all the phases involved.*
5. *Review and evaluate an investigative project in the land- or sea-based sector.*

## ASHRT-409-1505 Pest and Diseases Management

Unit Level (MQF/EQF): 4

Credits: 9

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 225

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### Unit Description

Understanding the impact of pests in agriculture and horticulture, coupled with the knowledge for the legal obligations for the purchase and legal safe application of plant protection products is an extremely important skill to enable true yield potential and marketable crop quality without compromising the environment and consumer health.

In this unit learners will develop knowledge related to pests in the form of weeds, diseases and invertebrate pests, the effect on plant growth, development and quality. Learners will study the lifecycles of the main pests for each category for the major crops grown in Malta. Laboratory identification and fieldwork skills will be developed to allow identification and to help develop skills in pest and disease control.

Interactions of pests and diseases and their effects on plant species will be studied to gain an understanding on their population growth or decline and the influence of environment on growth.

Learners will also explore the pest and disease lifecycles and techniques that can be employed to help reduce economic damages. The impact on yield and quality will be considered to enable learners to evaluate the need for or justification for control.

This unit will also study the content of the pesticide course that the local farmers are legally obliged to sit in order for them to purchase, utilize and transport plant protection products.

### Learning Outcomes

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

1. *Identify and classify the key pests and diseases for a variety of crops in the Maltese archipelago.*
2. *Explain the need for appropriate management of pests to maintain optimum health, quality and functioning of cropping systems.*
3. *Recognise key risk factors for pest damage and learn how to avoid them where possible.*

4. *Develop an understanding of integrated pest management systems.*
5. *Evaluate current regulations and legislations related to the use of plant protection products.*



# ASHRT-409-2202: Cut Flower Production and Flower Arrangement

Unit Level (MQF/EQF): 4

Credits: 9

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 225

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## Unit Description

The commercial production of flowers within Malta for use in the local floristry industry is an important part of reducing the reliance on imported material for flower arrangement. The principles of cut flower production through to the post-harvest treatment of individual species provide essential knowledge for learners who wish to have involvement in the floristry industry. As well as this, the principles that underpin the development of flower arrangements are essential knowledge for learners entering into the professional world of the flower designer.

Flower arrangement is influenced by the sources of inspiration and governed by the principles and elements of design. The unit investigates the key sources of design inspiration for flower arrangements and how the sources of inspiration link together. This will enable the individual to produce a wide range of flower arrangements for an extensive range of occasions, in one of three styles; form-linear, vegetative or decorative.

## Learning Outcomes

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

1. *Employ principles of cut flower production*
2. *Identify the requirements for harvesting, grading, storage and preparation for market of cut flowers*
3. *Identify sources of design inspiration and the creative design process in floriculture*
4. *Apply principles and elements of floral design in various arrangements*

## **ASHRT-406-1509: Field Crop Planning and Production: Solanaceae, Cucurbits and Strawberries**

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

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### **Unit Description**

Solanaceae, Cucurbits and Strawberries are identified as key crops of economic importance to the island of Malta and therefore offer career opportunities and employment within the production industry and ancillary suppliers.

This unit covers the planning and growing of these key crops starting with the principles of soil management and cultivation techniques. This is covered in particular as applied to the potato crop as it is a below-ground “root” crop and so soil preparation is crucial for the successful production of high quality, marketable potato tubers.

The potato crop itself will be covered from variety choice through to harvest and storage. It will include planting rates and dates, crop nutrition, crop protection, irrigation and preparation for harvest. Markets for potatoes grown in Malta will also be discussed briefly.

The second part of the unit covers the intensive market garden crops of tomatoes, peppers, aubergines, melons, courgettes, cucumbers and pumpkins.

Comparisons are made between these crops within the principles of production practices such plant establishment, continuity of supply, crop training and management, through to harvesting and grading.

The principles of post-harvest management will be outlined for students to further investigate these in relation local practices in harvesting and marketing of each crop.

Visits to local producers of the named crops are seen as essential to illustrate and expand the student’s understanding of the principles of crop cultivation.

## Learning Outcomes

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

1. *Know how to prepare suitable subsoil and seedbed conditions for successful production of Solanaceae, Cucurbit and strawberry crops.*
2. *Know how to grow crops to produce maximum marketable yields using sustainable, integrated crop management techniques.*
3. *Compare crop production methods for tomatoes, peppers, aubergines, melons, courgettes, cucumbers and pumpkin.*
4. *Identify the requirements for post-harvest and marketing of tomatoes, peppers, aubergines, melons, courgettes, cucumbers and pumpkin.*

## CDKSK-406-2001: English

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

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### 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-406-2109: Information Technology

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

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### 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 learner 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.*

## **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

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### **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 4<sup>th</sup> 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.



## Learning Outcomes

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

1. *Understand the employability skills required for Industry 4.0*
2. *Use idea generation techniques to come up with ideas and evaluate chosen ideas*
3. *Understand the various stages of product and/or service development*
4. *Work in a team to develop a business idea which is commercially viable*

## **CDKSK-402-2104: Community Social Responsibility**

Unit Level (MQF/EQF): 4

Credits: 2

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 50

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### **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.*