



MCAST

MQF/EQF Level 4

AS4-A1-21

Advanced Diploma in Food Technology

Course Specification

Course Description

The food and beverage industry is a dynamic sector which requires a number of highly skilled technical people to cope with constantly changing customers' demands and new innovative production technologies. Food technologists monitor day-to-day manufacturing activities; ensure that safety and quality standards are met; improve existing products and design innovative foods and drinks. This is a multidisciplinary programme offered across four Institutes and includes topics on food analysis, product manufacturing, food safety, cost accounting and product design. The programme provides learners with the opportunity to gain knowledge of the industry and insights into the relevant tools and skills through work-based elements. This programme prepares learners for employment within SMEs as well as medium to large organizations which produce a range of food and drink products.

Programme Learning Outcomes

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

- 1. Understand how food and beverage organizations operate.*
- 2. Understand the importance of food safety and apply Hazard Analysis and Critical Control Point (HACCP) principles.*
- 3. Apply scientific methods and use fundamental scientific principles to food manufacturing problems.*
- 4. Assist in the development of new innovative food and beverage products.*

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 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: 3000

Mode of attendance: Full Time

Duration: 2 Years

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

Target group: Students exiting compulsory education

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

This course will be offered at

MCAST has four campuses as follows:

MCAST Main Campus

Triq Kordin, Paola, Malta

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

Institute for the Creative Arts

Mosta Campus

Misraħ Ghonoq Targa Gap,

Mosta

Institute of Applied Sciences,

Centre of Agriculture, Aquatics and Animal Sciences,

Luqa Road, Qormi

Gozo Campus

J.F. De Chambray Street

MCAST, Ghajnsielem

Gozo

Teaching, Learning and Assessment

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

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

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

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

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

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

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

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

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

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

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

The Programme Regulations referenced below apply. (DOC 004* available at: link <https://www.mcast.edu.mt/college-documents/>

Total Learning Hours

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

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

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

Grading system

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

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

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

All units are individually graded as follows:

A* (90-100)

A (80-89)

B (70-79)

C (60-69)

D (50-59)

Unsatisfactory work is graded as 'U'.

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

Detailed information regarding the grading system may be found in the following document: DOC 004* available at: link <https://www.mcast.edu.mt/college-documents/>

Intake Dates

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

Course Fees

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

Method of Application

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

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

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

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

Contact details for requesting further information about future learning opportunities:

MCAST Career Guidance

Tel: 2398 7135/6

Email: career.guidance@mcast.edu.mt

Current Approved Programme Structure

Unit Code	Unit Title	ECTS	Year	Semester
ASASC-406-1601	Fundamentals of Science	6	1	1&2
ASFDT-406-1601	Working in the Food and Beverage Industry	6	1	1&2
ASCHM-406-1602	Food Chemistry and Nutrition	6	1	1&2
ASFDT-403-2101	Introduction to HACPP and HACPP plan	3	1	1&2
ASFDT-406-1603	Food Product Manufacturing	6	1	1&2
ASFDT-406-1605	Quality Assurance and Quality Control	6	1	1&2
ASFDT-406-1609	Food Processing and Preservation	6	1	1&2
ASWBL-406-2003	Work Based Module 1	6	1	1&2
CDKSK-406-2109	Information Technology	6	1	1&2
CDKSK-406-2007	Mathematics	6	1	1&2
ASFDT-403-2103	Industry Based Experience in the food and Beverage Sector 1	3	1	1&2
ASFDT-403-2104	Industry Based Experience in the food and Beverage Sector 2	3	2	1&2
ASFDT-403-2102	Applied microbiology	3	2	1&2
ASFDT-406-1602	Process Engineering for Food Technology Specialists	6	2	1&2
ASFDT-406-1604	Food Innovation	6	2	1&2
ASFDT-406-1606	Food Analysis	6	2	1&2
ASFDT-406-1607	Decontamination Techniques	6	2	1&2
ASFDT-406-1608	Food Product Design	6	2	1&2
ASFDT-406-1610	Cost and Profitability Estimation in the Food Industry	6	2	1&2
ASPRJ-406-1603	Food Technology Project	6	2	1&2
ASWBL-406-2004	Work Based Module 2	6	2	1&2
CDKSK-404-1915	Employability and Entrepreneurial Skills	4	2	1
CDKSK-402-2104	Community Social Responsibility	2	2	1
Total ECTS		120	/	/

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

ASASC-406-1601: Fundamentals of Science

Unit level (MQF/EQF): 4

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

The aim of this unit is to enable learners to gain a broad theoretical and practical knowledge of chemistry, biology and physics. These key scientific skills would enable learner taking the level 4 qualification of food technology to understand scientific and technical information that will be useful for the learner.

The focus of this unit is on linking scientific principles with practical applications in engineering, food technology and other scientific fields. Learners will know the structure of atom and ionic bonding to form molecules. They will understand the chemical reactions and ionic bonding of atoms. Learners will know the structure and function of cell membrane, cell wall, nucleus and nucleolus. They will understand the nature of tissues and their functions.

Students will study different forms of energy and differentiate between potential energy and kinetic energy. They will learn how energy changes from one form to another and understand the nature of heat and transfer of heat. Learners will know the nature of electric charge, electric current and electric circuits. They will know the electromagnetic spectrum, nature of light, sound, ultrasound and uses of X-rays.

Learners will perform experiments in chemistry, biology and physics. They will do titrations, use microscope to identify cells and communicate results in their own work place as well as in other organizations to share the knowledge by means of reports and scientific papers.

Learning Outcomes

On completion of this unit the learners will be able to

1. *Use chemicals safely in a scientific and industrial setting*
2. *Understand the functions of cells, tissues, organs and body systems*
3. *Use different types of energy efficiently when working on food technology and production*
4. *Communicate using appropriate formats to share scientific information gained from own experiments and research.*

ASFDT-406-1601: Working in the Food and Beverage Industry

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

Unit Description

The general aim of this Unit is to provide learners with an overview of the food and drink manufacturing industry. It will offer the opportunity to learners to demonstrate they have the necessary skills to be able to work effectively, efficiently and safely in a Food and Beverage company. Learners will be able to identify and carry out standard procedures in the workplace safely in well-designed and operated work spaces and to communicate all aspects of the day-to-day running and data handling requirements of a variety of Food and Beverage workplaces. In this unit learners will be introduced to the stages within the manufacturing process of food and beverage products and they will be given an opportunity to understand the routes that food and drink products take from field to table. Students will also familiarize themselves with the regulatory and legislative requirements placed to protect individuals and the environment.

Learning Outcomes

On completion of this unit the learners will be able to

1. *Explain the importance of the food and beverage industry in Malta and beyond.*
2. *Understand how the food and beverage manufacturing industry operates.*
3. *Explain how procedures are followed and communicated in the workplace.*
4. *Identify key regulations and legislation related to food production.*

ASCHM-406-1602 Food Chemistry and Nutrition

Unit level (MQF/EQF): 4

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

This unit is mainly theory based and its main objectives are to introduce the learners to the chemistry of the main food components including carbohydrates, lipids and proteins, and to introduce the fundamental principles related with nutrition such as basic concepts, diet-related conditions, food allergies and intolerances, and guidelines related to dietary intake.

Learners will be introduced to basic organic chemistry concepts so as to be able to understand reactions that occur in living organisms. This will also enable them to recognize different classes of biomolecules and relate their structure with their functions in living organisms. The part related to nutrition will enable learners to develop their knowledge and understanding about the link between nutrition and health.

This unit is significant for learners who wish to pursue their studies in the food sector. It also complements other units, such as food analysis.

Learning Outcomes

On completion of this unit the learners will be able to

1. *Describe the relationship between the structure and function of food carbohydrates.*
2. *Describe the relationship between the structure and function of food proteins and enzymes.*
3. *Describe the relationship between the structure and function of lipids.*
4. *Outline the basic nutritional concepts and requirements for a well-balanced healthy diet.*

ASFDT-403-2101: Introduction to HACPP and HACPP plan

Unit level (MQF/EQF): 4

Credits: 3

Delivery Mode: Face to Face

Total Learning Hours: 75

Unit Description

When producing food and beverage products, it is an utmost priority to ensure that these would be safe for human consumption. The general aim of the unit is to give learners an insight into the safety requirements that govern the food and beverage manufacturing industry. This unit focuses on the techniques used to minimize micro-organisms in critical areas of the food production and storage facilities.

Learners will develop an appreciation of the need for health and safety industry standards together with compliance with legislation with particular reference to food safety, and health and safety when manufacturing food and beverage products.

The unit will focus on the HACCP system requirements and the seven principles which govern the system. This includes defining quality policy, defining the scope of the HACCP system, determining tasks, responsibilities and authority, making resources available and management assessment. In particular, the course syllabus overviews the requirements targeting the essentials of food hygiene for the catering staff but also provides the detailed concepts of the HACCP system.

Learning Outcomes

On completion of this unit the learners will be able to

- 1. Recognise the importance of Food safety law and HACCP.*
- 2. Identify Biological, Chemical, and Physical Hazards.*
- 3. Analyse the assignment of hazards and risk categories.*
- 4. Determine critical control points in food production.*
- 5. Apply corrective action procedures for deviations from the critical control point and imits.*
- 6. Develop an action plan for Implementing HACCP.*

ASFDT-406-1602: Process Engineering for Food Technology Specialists

Unit level (MQF/EQF): 4

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

It is important that those working in food and beverage production areas are able to relate to the general manufacturing principles that are used within industry. This unit is intended to support learners with the necessary key engineering and Processing knowledge, skills and competences to be able to work in food and beverage manufacturing areas. It is targeted towards those learners that do not have an engineering background but would like to work in the food and beverage industry.

During this unit learners will be exposed to the different Control Processing. They will be given the opportunity to identify key components of control systems available for steady production with minimum variation.

Learners will be exposed to different plant layouts. With the use of practical examples learners will learn which layout to use in different situations.

Finally, learners will be exposed to inventory and classifying coding system.

Learning Outcomes

On completion of this unit the learners will be able to

- 1. Outline different tools to assist a company in the continuous improvement process.*
- 2. Demonstrate how to keep a manufacturing process under continuous control.*
- 3. Recognise different process layouts and methods of classifying in a food production facility.*
- 4. Understand the fundamentals of inventory management and control.*

ASFDT-406-1603: Food Product Manufacturing

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

Unit Description

It is important that those working in food and beverage production areas are able to relate to the general manufacturing principles that are used within industry. This unit is intended to support learners with the necessary key engineering and manufacturing knowledge, skills and competences to be able to work in food and beverage manufacturing areas. It is targeted towards those learners that do not have an engineering background but would like to work in the food and beverage industry.

During this unit learners will be exposed to the different machinery used in food and beverage production. They will be given the opportunity to identify key components of the machinery and understand how these operate and how these should be maintained in accordance to standard protocols and established maintenance schedules. Learners will also be able to relate to the basic manufacturing principles and practices used in engineering workshops. The unit is not intended to go into depths which are expected to be achieved in specific engineering oriented qualifications.

Strong emphasis would be placed on the importance, impact and effect of using a range of different equipment to produce food items of quality and consistency. However, the importance of selecting the right raw materials to ensure quality and consistency will also be investigated through unit

Learning Outcomes

On completion of this unit the learners will be able to

- 1. Understand the different categories of food products, the raw materials, machinery and processes used to produce them.*
- 2. Outline the basic equipment constituents used in food production areas.*
- 3. Recognize the basic manufacturing principles and practices used in engineering workshops.*
- 4. Maintain machinery found in food and beverage manufacturing industries in accordance to maintenance schedules.*

ASFDT-406-1604: Food Innovation

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

Unit Description

Man's management of food resources has been the basis of all his achievements ever since he realised that, by working as a team, he could hunt big game that he had, previously, considered as too big for him to handle on his own, or else was considered a predator to be avoided and feared. Instead of going out to hunt on his own and risk getting injured or even killed, man extracted himself from the food chain and became the top boss, the overseer of everything else. Another food innovation introduced by man was that of using fire to cook his food which rendered it -especially meat - much more digestible and easier to chew.

It took him quite a few more millennia before he brought about yet another major innovation in food collection. This innovation was the domestication of wild animals that could then be kept confined inside enclosures to be slaughtered for meat or exploited for other uses. This not only eliminated the risks associated with going out into the wilderness to hunt but also saved immense amounts of time and energy which could thus be employed for more creative activities and further innovations.

As we can see, innovation in relation to food has been a constant motif in man's existence since time immemorial.

Today we have to address the theme of food innovation through many perspectives. Food production, processing, preservation, distribution, retailing, consumption and promotion has become such a complex and sophisticated activity that we cannot deal with food innovation as a monolithic concept. Each phase of the food chain has its own set of innovation potentials and challenges and we need to address those different phases separately.

This particular unit will provide a general overview of how innovation inputs can impact the food industry but its main focus will be on the innovative modes of presenting the food items produced by primary producers - farmers - to the consumer whether it be a home consumer concocting healthy, appetizing meals for the family or a catering establishment that is anxious to add something exciting to the menu.

Innovation and Diversification often go hand-in-hand. Sometimes, the innovative aspect aims at appealing to the health conscious consumer who is in search for meals that incorporate consistent amounts of fruits and vegetables while at the same time presenting a very appetising appearance and aroma. On the other hand, innovation could focus on the efficient harvesting, packaging and delivery of fresh produce that renders the product attractive to the consumer because of its manifestly fresh appearance while carrying an economic price tag.

In today's global economy, food innovation involves the design and development of new food products, the improvement or combination of existing food products, research into food trends and food management.

Food innovation invariably goes hand in hand with food technology and covers a very wide field, from companies using science to improve the yields or composition of produce, to businesses focusing on reducing time to market and simplifying the supply chain, through to the online market places, delivery services and in-house gadgets in the hands of the consumers.

There are many possible innovation opportunities in the food industry. One of the tests that learners will need to undergo is to see how many innovative ideas they can come up with related to the food production dimension that they are familiar with, or have chosen to explore. The easiest approach in this respect is to identify one major challenge facing the primary food sector they are familiar with and examine the situation carefully to see how they could transform that challenge into an opportunity.

This unit has is characterised by a strong component of creativity and imagination which, at the same time, depends on a well-developed skills base. Food innovation techniques require a developed understanding of consumer tastes, needs, and such constraints as purchasing power, time availability for buying and preparation, storage and refrigeration space. But food innovation is also directed at commercial outlets such as restaurants, delicatessens, kiosks, travel services such as airlines and cruise liners, industrial and military kitchens and canteens, as well as whole variety of convenience outlets.

Learning Outcomes

On completion of this unit the learners will be able to

- 1. Discuss a range of major food innovations that have been introduced over the past century at different phases of the food chain.*

2. *Identify a range of food innovations which could be applied to the primary food production stage to improve market share or obtain value added.*
3. *Assess the role of technology on a range of food innovations in this country.*
4. *Discuss how, and to what extent can food technology and innovation contribute towards developing a sustainable global food industry.*

ASFDT-406-1605: Quality Assurance and Quality Control

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

Unit Description

The unit reviews quality control and quality assurance measures taken in order to ensure the quality of food products. Food quality and safety is important since it ensures that the consumer is not susceptible to any form of contamination, illness or reaction following the ingestion of a food product. In this unit, learners are provided with an understanding of quality assurance and quality control procedures, tools for quality improvements and the importance of regular internal and external audits.

In this unit, different quality management standards will be examined along with their implementation. The implications of poor quality standards will also be examined and learners will be exposed to different tools which lead to quality improvements. Finally, the benefits of internal and external audits are reviewed.

Learning Outcomes

On completion of this unit the learners will be able to

- 1. Outline the concepts of food product quality and the method by which it is achieved.*
- 2. Understand the relative merits of different types of Quality Control tests.*
- 3. Understand the intrinsic principles of Quality Assurance and Quality Control.*
- 4. Explain the value of audits and the way these promote continuous improvement in the quality cycle.*

ASFDT-406-1606: Food Analysis

Unit level (MQF/EQF): 4

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

This is a practical unit which is designed to enable learners to enhance their knowledge, skills and competences in order to be able to work in a food and beverage laboratory. Furthermore, learners will be provided with a theoretical and practical understanding of analytical methods to investigate the food properties, such as chemical composition. Learners will develop the necessary laboratory skills to work in a laboratory following GLP principles and use different apparatus and equipment to analyze food and carry out investigations in a specialized laboratory. In a laboratory, it is essential to work accurately and safely, thus, through this unit, learners will also develop confidence and manipulative skills to handle chemicals safely, set up and operate equipment, and understand procedures followed in the laboratory. Learners will also be provided with opportunities to work as a team, and apply theoretical concepts to problem solving by planning an investigation, selecting the appropriate analytical techniques followed by food analysis.

This unit is essential for learners who would like a career as a laboratory analyst in the food and beverage sector.

Learning Outcomes

On completion of this unit the learners will be able to

1. *Carry out various tasks in a food laboratory safely and effectively.*
2. *Understand the principles associated with analytical techniques which are related with food analysis.*
3. *Use common qualitative and quantitative analytical techniques associated with food analysis.*
4. *Select the appropriate analytical technique when presented with a practical problem.*

ASFDT-406-1607: Decontamination Techniques

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

Unit Description

Consumers' demands for good quality and safe food and beverage products has led to an increasing awareness about the importance of hygiene during various stages of food production, and to an increasing interest in novel physical and chemical decontamination technologies in the food and beverage industry.

The first part of this unit will deal with health and safety issues such as hazards, importance of health and safety in different sectors of the food and beverage industry, such as, during processing, manufacturing and packaging, and occupational health and safety. This will be followed by awareness about the sources of food contamination, an overview of hygiene development in this industry, and different hygiene control measures that must be followed rigorously to ensure that the final product is safe for human consumption. One cannot appreciate the importance of decontamination techniques if s/he is not aware about the microorganisms responsible for food poisoning.

As a result, in the second part of this unit, students will gain knowledge about different microorganisms that are relevant for the food and beverage industry, including pathogenic microorganisms that cause food poisoning and food spoilage microorganisms that affect the quality of the product.

Case studies on food poisoning and food deterioration by food spoilage microorganisms will also be included in this part. In the third and fourth part of this unit, students will be exposed to various physical and chemical decontamination techniques used in the food and beverage industry to ensure food safety and meet food safety regulatory requirements.

Learning Outcomes

On completion of this unit the learners will be able to

1. *Understand the importance of health and safety, and hygiene in the food and beverage industry.*
2. *Understand the role of microorganisms in food spoilage and food poisoning.*
3. *Demonstrate physical decontamination techniques used on an industrial level in the food and beverage industry.*
4. *Demonstrate chemical decontamination techniques used on an industrial level in the food and beverage industry.*

ASFDT-406-1608: Food Product Design

Unit level (MQF/EQF): 4

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

This unit is intended to introduce learners to a number of both functional and commercial considerations related to food packaging and its role beyond safe containment and transport. Learners shall familiarise themselves with the knowledge and skills necessary to handle and package various types of food and develop values about the safety and environmental impact of packaging before studying how to best promote specific food items to a target audience. A basic study of packaging materials, printing processes and marketing strategy will play a key role in the learners' development throughout this unit.

This unit is particularly relevant to learners studying food technology who wish to develop a working knowledge of point of sale promotion and marketing, or engage in entrepreneurial pursuits.

On completion of this unit learners will be able to successfully discern between various food packaging materials and processes and select appropriate solutions for different scenarios. They will also gain an understanding of how to communicate desirable characteristics of a food product to consumers via its packaging's appearance by using colour, typography and imagery in a conscientious and intelligent manner. Assessment shall take place based on learners' research and practical outcomes.

Learning Outcomes

On completion of this unit the learners will be able to

1. *Identify and evaluate a range of packaging examples in the marketplace.*
2. *Describe different printing and finishing processes related to packaging.*
3. *Apply suitable graphic elements to a food packaging solution for promotion.*
4. *Present and evaluate a food packaging solution.*

ASFDT-406-1609: Food Processing and Preservation

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

Unit Description

Food processing and food preservation are two techniques that go hand-in-hand and constitute methods of converting raw food items into well-preserved and tasty food items, condiments, and side dishes that complement main dishes. Basically every form of food preservation involves some form of processing even if it is only a matter of drying or desiccating a fruit, vegetable or flesh. The process of preparing the food item and exposing it to the desiccating element, even at its most rudimentary level, is in itself a form of processing.

Methods of Food preservation and processing were originally devised to render a variety of foodstuffs to be available all year round under one form or another. Different regions developed their own particular methods and processes and concentrated on particular food items which, in time, became renowned as the specialities of those regions. Another very important motive behind the preservation and processing of raw food items was that of utilising and adding value to surplus agricultural production or to render the product easier to handle and to transport.

Some products are processed in order to reduce their water content drastically and produce a very concentrated form rendering it more convenient for use and for transportation and storage.

This is a hands-on, skilled based unit that will familiarise learners with the various primary food products produced by the Maltese agricultural sector and other rural enterprises. The unit will provide learners with the necessary skills and techniques to demonstrate that they are able to select, prepare, investigate and test a range of local processed and/or preserved food and beverage products. They will also familiarise themselves with the industrial and commercial application of these processes and recognise the fundamental similarities and differences between industrial and artisanal methods of processing and preserving raw food items.

The unit is composed of two distinct sections that could be delivered separately or jointly. One section focuses on simple preservation of food products as a form of

extending the lifetime of specific primary food products. The other section involves the transformation of primary food products through such processes as fermentation, baking, casefying, distillation, and other processes that totally transform the product into a completely different food or beverage. This section, however, also requires a further preservation intervention to ensure that the finished transformed product can keep at optimal condition for the required or desired interval. There are clear advantages in delivering the two sections in tandem because of the various parameters that are common to both and which could provide important advantages if proper focus is maintained on the linkages that exist between them. Another important linkage is the opportunity that such processes provide for food diversification and innovation which is covered in a separate unit.

Learners will subsequently have the opportunity to analyse and assess the prepared products in the laboratory and determine how different processes and different forms of preservation affect the finished products. A further exercise is geared to enable learners to appraise their product to establish whether they have achieved the desired outcome and to obtain feedback from third parties regarding the preservation element as well as the organoleptic characteristics of the finished product.

Learners will be provided with ample opportunity to work in a food production facility and a lab environment.

Learners will carry out independent reflective research and study to obtain essential inductive insight into the work-based experience in the food and beverage sector.

Learning Outcomes

On completion of this unit the learners will be able to

- 1. Discuss principles and application of food preservation and processing methods employed in the food and beverage industry and compare them with artisanal processes.*
- 2. Prepare a range of food and/or beverage products using artisanal processes and preservation methods while adhering to established food safety and health and safety regimes.*
- 3. Carry out a HACCP procedure of both the artisanal and the industrial preservation and processing of local food and beverage items and carry out tests on finished products.*
- 4. Discuss how, and which, preservation and processing initiatives could enhance the market for local agricultural products.*

ASFDT-406-1610: Cost and Profitability Estimation in the Food Industry

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

Unit Description

For anyone considering a career in food technology, it is important to have a good understanding how a food and beverage manufacturing organisation operates and have a basic understanding of the internal and external factors that would affect the commercial viability of a food or drink product. This unit will develop the learners' understanding of cost accounting. Furthermore, the unit will help give learners a firm foundation for employment in the food and beverage sector and an understanding of the organisational, financial and social constraints within which a food and beverage organisation operates.

This is a hands on unit whereby learners, through the use of a number of case studies, will be given the opportunity to use cost accounting techniques to determine the accurate cost information of food and beverage products to decide on which products to keep and which products to discontinue, for assessing productivity improvements and for performance evaluation and control. This data is vital for food and beverage manufacturing organisations as improperly designed cost accounting system can lead to costly errors in decision-making.

The aim of the unit is to provide aspiring food technologists with an appreciation of financial implications of decisions taken in food manufacturing assembly lines. At the end of the unit learners are expected to relate the technical aspects learnt in other units to the financial aspects and would be able to provide the most cost effective technical solutions.

Learning Outcomes

On completion of this unit the learners will be able to

- 1. Understand the fundamental principles of costing systems within a food and beverage manufacturing environment.*
- 2. Use costing techniques to determine the product costs and profitability of a food and beverage manufacturing organisation.*
- 3. Use information gathered from costing systems to assist decision-making within a food and beverage manufacturing organisation.*
- 4. Discuss how external factors and the economic environment affect the operation of a food and beverage manufacturing organisation.*

ASPRJ-406-1603: Food Technology Project

Unit level (MQF/EQF): 4

Credits: 6

Delivery Mode: Face to Face

Total Learning Hours: 150

Unit Description

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 food and beverage sector. Through this unit the learners will be able to conduct a literature review, compile a proposal, identify, plan, carry out an investigative project, and analyse and present the results of the project.

The topics investigated during the project will, wherever possible, relate to real life issues and will simulate situations likely to be encountered in a working environment. Learners should carry out the investigative project within an organisation, be it a local authority, a charity or voluntary organisation, an industry organisation, or a local community group. The project can be carried out over a single stretch of a few weeks, or else during weekends or recess periods. The project will help the learners to develop project management and communication skills by investigating a topic of their choice.

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

Learners will develop this skill of taking responsibility of their own learning by choosing independently their own research problem to be solved. They should produce a breakdown of resources and a project action plan including intermediate deadlines. This unit will provide learners with an excellent opportunity to apply knowledge attained during other units to solve real life issues in the Food and Beverage sector.

Learning Outcomes

On completion of this unit the learners will be able to

1. *Conduct a literature review related to a topic in food technology.*
2. *Write a proposal for an investigative project in the food and beverage sector.*
3. *Design and produce a detailed plan for an investigative project in the food and beverage sector.*
4. *Construct an investigative project in the food and beverage sector and monitor all the phases involved.*

ASWBL-406-2003: Work Based Module 1

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

Unit Description

This unit is the first part of a two-part course in Work-Based Module (Work-Based Module Part 2 ASWBL-406-2004).

This is a skills based unit that will expose learners to the work carried out in the food and beverage industry. The unit will allow learners to demonstrate that they are able to prepare, investigate and test a range of food and beverage products.

In this unit, learners are to prepare a range of food and beverage products in accordance to given formulations. Learners will be then asked to analyse and investigate the prepared products in a laboratory to be able to understand how different nutrients and ingredients affect finished products. In addition, learners will appraise their product to ensure that they have achieved desired outcome.

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

Learning Outcomes

On completion of this unit the learners will be able to

- 1. Practice good hygiene and health and safety in food production areas.*
- 2. Cook and prepare food and beverage products.*
- 3. Understand food processing and food preparation basics.*
- 4. Conduct food science experiments and investigations associated with food and beverage processing.*
- 5. Investigate the quality properties of given or produced food and beverage products.*

ASWBL-406-2004: Work Based Module 2

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

Unit Description

This unit is the second part of a two-part course in Work-Based Module (Work-Based Module Part 1).

This is a skills based unit that will expose learners to the work carried out in the food and beverage industry. The unit will allow learners to demonstrate that they are able to prepare, investigate and test a range of food and beverage products.

In this unit, learners will focus on the preservation of food and beverage products. Learners will be then asked to analyse and investigate the prepared products in a laboratory to be able to understand how different nutrients and ingredients affect finished products. In addition, learners will appraise their product to ensure that they have achieved desired outcome. Learners will be given ample opportunity to work in a food production area and a Lab environment.

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

Learning Outcomes

On completion of this unit the learners will be able to

1. *Understand the potential spoilage of food and how to prevent it.*
2. *Follow procedures to preserve a range of food products.*
3. *Investigate different preservation methods on given or produced foods and beverages.*
4. *Investigate the quality properties of given or produced preserved food and beverage products.*

ASFDT-403-2102 Applied microbiology

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

Unit Description

When producing food and beverage products it is an utmost priority to ensure that these would be safe for human consumption. The general aim of the unit is to give learners an insight into the safety requirements that govern the food and beverage manufacturing industry.

This unit will introduce learners to the world of microbiology and its applications in the food industry. It will highlight the importance of micro-organisms in food production in terms of food spoilage and food poisoning, whilst highlighting the important uses of certain micro-organisms for the production of particular food products. By the end of the unit it is envisaged that learners will be able to understand the conditions that govern micro-organisms growth and would be able to develop an understanding of the effect on micro-organisms on processing, preservation and storage techniques used in food production.

The learner will be exposed to a number of different microbiological techniques used in industry to identify and enumerate micro-organisms. This part of the unit is highly practical in nature and learners will be able to appreciate the importance aseptic techniques.

This unit focuses on the techniques used to minimize micro-organisms in critical areas of the food production and storage facilities. Learners will develop an appreciation of the need for health and safety industry standards together with compliance with legislation with particular reference to food safety, and health and safety when manufacturing food and beverage products.

Learning Outcomes

On completion of this unit the learners will be able to

1. *Analyse the microbial physiology of the cell structure and function; growth and nutrition.*
2. *Identify the instruments, techniques and data collection methods used in microbiological investigations.*
3. *Use treatments to decrease pathogens in food and beverage products.*

4. *Identify the industrial processes and products associated with micorganisms.*

ASFDT-403-2103: Industry-Based Experience in the Food and Beverage Sector 1

Unit level (MQF/EQF): 4

Credits: 3

Delivery Mode: Face to Face

Total Learning Hours: 75

Unit Description

This unit is the first part of a two part course in Industry-based experience in the food and beverage sector (Industry-based experience in the food and beverage sector Part 2 ASFDT-403-2104).

Working within the food and beverage manufacturing sector is an integral part of the learning process for all aspiring food technologists. This unit aims to offer learners an opportunity to conduct a work experience within a local or foreign food and beverage manufacturing setting. Through this industry-based experience learners will be able to apply their knowledge and understanding of Food Sciences in an industry setting.

Learners shall gain practical experience of the industry, its management systems and structures providing them with a firsthand introduction to a food manufacturing business. Throughout the unit learners will be able to gain hands-on experience and enhance their technical competences, transversal and soft skills. Various technical aspects shall be covered (e.g. Quality control processes; marketing; production; HACCP plans; distribution of resources; processes evaluation). Different learners may cover different technical skills depending on the place of work, nevertheless, it is expected that most of the transversal and soft skills covered during the learners' working experience shall be the similar.

One of the objectives is to prepare the learners for the world of work. This is achieved by covering various aspects from familiarization with the local industry; preparation for a job interview to discussions on the correct work etiquette at the place of work. Part of the unit requires learners to use problem based learning approach.

Learning Outcomes

On completion of this unit the learners will be able to

- 1. Prepare for applying for a job in the food and beverage sector.*
- 2. Prepare for a work-related experience in the food and beverage sector.*
- 3. Undertake a work-related experience in the food and beverage sector.*

4. *Recognise the importance of record keeping in the food and beverage sector.*

ASFDT-403-2104: Industry-Based Experience in the Food and Beverage Sector 1

Unit level (MQF/EQF): 4

Credits: 3

Delivery Mode: Face to Face

Total Learning Hours: 75

Unit Description

This unit is the second part of a two part course in Industry-based experience in the food and beverage sector (Industry-based experience in the food and beverage sector Part 1 ASFDT-403-2103).

Working within the food and beverage manufacturing sector is an integral part of the learning process for all aspiring food technologists. This unit aims to offer learners an opportunity to continue with the work experience within a local or foreign food and beverage manufacturing setting which they commenced in their first year. Through this industry-based experience learners will be able to apply their knowledge and understanding of Food Sciences in an industry setting.

Throughout the unit learners will continue to gain hands-on experience and enhance their technical competences, transversal and soft skills. Various technical aspects shall be covered (e.g. problem identification and solving, gathering and managing information). Although during Part 1 different learners would have covered different technical skills depending on the place of work, nevertheless, it is expected that most of the transversal and soft skills covered during the learners' working experience shall be similar.

One of the objectives is to prepare the learners for the world of work. This is achieved by guiding the learners to identify problems, be able to solve them and take the appropriate decision. Learners will also be required to prepare their personal development plan. Part of the unit requires learners to use problem based learning approach.

Learning Outcomes

On completion of this unit the learners will be able to

- 1. Practice the principles of problem identification, problem solving and decision making in the field of food sciences.*
- 2. Manage relevant information, whilst generating alternatives and implementing solutions in the field of food sciences.*
- 3. Review a work-related experience in the food and beverage sector.*
- 4. Produce a Personal Development Plan to keep track of the knowledge and skills gained throughout the work-related experience.*

CDKSK-404-1915: Employability and Entrepreneurial Skills

Unit Level (MQF/EQF): 4

Credits: 4

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 100

Unit Description

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

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

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

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

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

Unit Description

This unit focuses on Community Social Responsibility and provides an opportunity for learners to better understand themselves and the others and to establish goals in life. Community social responsibility enables learners to understand their strengths and areas for improvement and prepares them for life, employment and to become active citizens in society.

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

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

Learning Outcomes

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

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

CDKSK-406-2109: Information Technology

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

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

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

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

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

Learning Outcomes

On completion of this unit the 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-406-2007: Mathematics

Unit Level (MQF/EQF): 4

Credits: 6

Delivery Mode: Fully Face-to-Face Learning

Total Learning Hours: 150

Unit Description

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

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

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

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

Learning Outcomes

On completion of this unit the student will be able to

- 1. Demonstrate visual and logical techniques in evaluating graphical representations and communication skills in presenting the results effectively.*
- 2. Apply information processing skills to solve problems in a relevant statistical context.*
- 3. Demonstrate evaluation and communication skills in solving and presenting problems applied to costing methods and techniques.*
- 4. Apply creative thinking skills and demonstrate evaluation skills to solve problems in a relevant (game theory) context.*