



L-Università
ta' Malta

MATSEC
Examinations Board



SEC 35 Syllabus

Agribusiness

2029

Table of Contents

Introduction	2
Programme Learning Outcomes	2
Unit Learning Outcomes.....	3
Programme Level Descriptors	4
Interpreting the Syllabus.....	5
Unit Structure.....	5
Assessment Criteria.....	5
Content.....	5
Scheme of Assessment	6
School-based assessment (SBA)	6
Coursework	6
Controlled Assessment.....	7
Unit 1: Plant and Soil Science.....	8
Unit Description.....	8
Learning Outcomes	8
Assessment Criteria and Content	9
Learning Outcomes and Assessment Criteria.....	15
Unit 2: Aquatic and Land Based Production	21
Unit Description.....	21
Learning Outcomes	21
Assessment Criteria and Content	22
Learning Outcomes and Assessment Criteria.....	27
Unit 3: Rabbit Care and Genetics	32
Unit Description.....	32
Learning Outcomes	32
Assessment Criteria and Content	33
Learning Outcomes and Assessment Criteria.....	38
Appendix 1 – Minimum Required Resources.....	43
Appendix 2 – Portfolio Marking Schemes.....	48

Introduction

This syllabus is based on the curriculum principles outlined in *The National Curriculum Framework for All* (NCF) which was translated into law in 2012 and designed using the *Learning Outcomes Framework* that identify what students should know and be able to achieve by the end of their compulsory education.

As a learning outcomes-based syllabus, it addresses the holistic development of all learners and advocates a quality education for all as part of a coherent strategy for lifelong learning. It ensures that all children can obtain the necessary skills and attitudes to be future active citizens and to succeed at work in society irrespective of socio-economic, cultural, racial, ethnic, religious, gender and sexual status. This syllabus provides equitable opportunities for all learners to achieve educational outcomes at the end of their schooling which will enable them to participate in lifelong and adult learning, reduce the high incidence of early school leaving, and ensure that all learners attain key twenty-first century competences.

This programme also embeds learning outcomes related to cross-curricular themes, namely digital literacy; diversity; entrepreneurship creativity and innovation; sustainable development; learning to learn; and cooperative learning and literacy. This way students will be fully equipped with the skills, knowledge, attitudes and values needed to further learning, work, life and citizenship.

The aim of the vocational programme in Agribusiness is to provide students with the underpinning knowledge related to the Agribusiness industry. By the end of the programme, students are expected to have gained sufficient skills and knowledge and be able to apply them.

Programme Learning Outcomes

At the end of the programme, I can:

- Become familiar with the most common horticultural plants grown on the Maltese Islands.
- Become familiar with the appropriate methods of soil sampling and analysis.
- Develop the required skills and techniques in land cultivation, plant care and plant propagation.
- Be familiar with the Health and Safety regulations when using standard tools and equipment related to the horticultural and animal husbandry sectors.
- Promote best practices related to animal care whilst safeguarding both the animal and the carer.
- Provide candidates with the basics of animal care and breeding.
- Enable candidates to develop an appreciation of the business aspect of agricultural enterprises.
- Show the importance of animal breeding for the society and the economy.

Unit Learning Outcomes

Unit 1: Plant and Soil Science

At the end of the unit, I can:

- LO 1. Demonstrate an understanding of the life cycle and morphologies of different organs of crop/ornamental plants' roots and shoot systems.
- LO 2. Demonstrate an understanding of Health and Safety in agribusiness.
- LO 3. Undertake a season's growth of different groups of vegetables.
- LO 4. Apply a suitable fertiliser using the appropriate technique.
- LO 5. Demonstrate an understanding of the purpose and methods used for soil analysis.
- LO 6. Demonstrate an understanding of the soil factors which contribute to healthy plant growth.

Unit 2: Aquatic and Land Based Production

At the end of the unit, I can:

- LO 7. Demonstrate an understanding of the morphology and nutritional requirements of different fish species.
- LO 8. Undertake proper fish husbandry tasks to prevent and cure diseases and correct disorders.
- LO 9. Describe the main processes of plant physiology.
- LO 10. Conduct post-harvesting processes according to marketing standards.
- LO 11. Explain the propagation requirements and growth media for different plants.

Unit 3: Rabbit Care and Genetics

At the end of the unit, I can:

- LO 12. Demonstrate an understanding of the biology and genetic principles of rabbit production.
- LO 13. Maintain the right environment for rabbit husbandry.
- LO 14. Use adequate preventive and curative measures for healthy rabbit growth.
- LO 15. Explain the reproductive phases and breeding of rabbits.
- LO 16. Demonstrate an understanding of the ways rabbits can be processed to enhance revenues of a rabbit farm.

Programme Level Descriptors

This syllabus sets out the content and assessment arrangements for the award of Secondary Education Certificate in Agribusiness at Level 1, 2 or 3. First teaching of this programme begins in September 2024. First award certificates will be issued in 2027.

The following levels refer to the qualification levels that can be obtained by candidates sitting for SEC examinations. These are generic statements that describe the depth and complexity of each level of study required to achieve an award at Level 1, 2 or 3 in Agribusiness. (Level 1 being the lowest and Level 3 the highest).

Level 1: At the end of the programme the candidate will have obtained basic knowledge, skills and competences in the subject such as basic repetitive communication skills and the ability to follow basic, simple instructions to complete tasks. Support is embedded within the task.

Level 2: At the end of the programme the candidate will have obtained good knowledge, skills and competence in the subject such as the interpretation of given information and ideas. The candidate will have developed the ability to carry out complex tasks. Limited support may be embedded within the task.

Level 3: At the end of the programme the candidate will autonomously apply knowledge and skills to a variety of complex tasks. Candidates will utilise critical thinking skills to analyse, evaluate and reflect upon their own work and that of others. Problem solving tasks may be part of the assessment process.

Interpreting the Syllabus

This document is an assessment syllabus. Whilst the content provided is the minimum expected for assessment purposes, the provision of further examples or information is encouraged – although not mandatory – for students to enjoy the learning process and get a better overview of the subject.

Unit Structure

The various learning outcomes, assessment criteria, and content are grouped under three units. Each unit is presented in the following structure:

- Title
- Description
- Learning Outcomes
- Assessment Criteria and Content
- Learning Outcomes and Assessment Criteria

Educators may devise their own plan for content delivery across the years of study. They may choose to follow the unit learning outcomes and content structure as presented in the syllabus, and conclude each unit by the end of every scholastic year, or follow a different order which in their professional view would be more conducive to learning of any particular subject area or topic. However, by the end of the three-year programme in Year 11, all content delivery and continuous assessment should be completed, in time for submission to MATSEC in the indicated time-frames and format.

Assessment Criteria

The active verb used in assessment criteria (such as list, identify, outline, describe, explain, etc...) indicates what candidates are expected to know or be able to do. It also provides direction with respect to expected complexity in the candidates' responses or work. These verbs are defined in the Glossary of Terms available on the MATSEC website. Application criteria are to be interpreted in terms of Bloom's taxonomy psychomotor domain.

Content

For each assessment criterion, only the minimum content that needs to be covered is listed. Examples (e.g.), commas, semi-colons, bullets, 'or', and 'N.B.' are used for presentation and guidance purposes only. While all the material reflecting both the unit content and the assessment criteria is to be delivered, this will not necessarily be assessed by MATSEC in its entirety, as indicated in the Scheme of Assessment. Where the plural is used in any assessment criterion (e.g. types, aspects, steps, etc.), two or more answers are usually expected, although this may not always be the case.

Scheme of Assessment

The assessment of this subject follows the Secondary Education Certificate Regulations and the MATSEC Assessment Code of Practice governing each respective cohort. It shall be based on three components, each of which contributes towards the overall subject mark as follows:

COMPONENT	LEVEL WEIGHT (OVERALL SUBJECT MARK)
SBA (Paper I)	30%
Coursework (Portfolio)	30%
Controlled assessment (Paper II)	40%

Candidates have to attempt all three assessment components, and fulfil the set criteria in the coursework component and Paper II, to obtain a level higher than Level 1.

Individuals may not register as private candidates in this subject, unless they are resitting the subject in a subsequent Main Session. In the latter case, marks obtained in the SBA and the coursework can be carried forward for up to five years from the first sitting.

School-based assessment (SBA)

SBA (Paper I) refers to the assessment of the application criteria specified in the syllabus, assigned to candidates and marked by school teachers. This component is unmoderated.

SBA should be set at Level 1-2-3, following a 30-30-40 percentage mark allocation, with Level 3 carrying the highest marks.

The SBA should be marked out of 100 each year (9, 10, and 11). The assessment for each year will contribute to 10% of the overall subject mark and will be reported to MATSEC by the school when the candidate is in Year 11. Therefore, each year will equally contribute to the final 30% mark of the SBA.

SBA SUBMISSION TO MATSEC IN YEAR 11			LEVEL WEIGHT (OVERALL SUBJECT MARK)
Year 9	Year 10	Year 11	30%
[0 to 100] marks	[0 to 100] marks	[0 to 100] marks	

Coursework

Coursework in this subject refers to a Portfolio, divided in three parts carried out across the three-year programme, which will be set and marked by the teacher following the templates downloadable from the MATSEC website and the marking schemes included as an appendix in the syllabus. This component is moderated.

Each coursework part will be marked out of 60 and will be set at Level 1-2-3. The assessment of each part will contribute to 10% of the overall mark and will be reported to MATSEC by the school when the candidate is in Year 11. Therefore, each part will equally contribute to the final 30% mark of coursework.

The school is to upload a digital copy of their candidates' coursework on the MATSEC portal by the date established by the MATSEC Board and ensure that all coursework is available as instructed. Candidates may be called for an interview in relation to their coursework.

Candidates are to fulfil the set criteria in this assessment component to obtain a level higher than Level 1.

COURSEWORK SUBMISSION TO MATSEC IN YEAR 11 FOR MODERATION			LEVEL WEIGHT (OVERALL SUBJECT MARK)
Part 1	Part 2	Part 3	30%
Based on any TWO application criteria from Unit 1	Based on any TWO application criteria from Unit 2	Based on any ONE application criterion from Unit 3 and a Self-Evaluation	
[0 to 60] marks	[0 to 60] marks	[0 to 60] marks	

Controlled Assessment

The controlled assessment (Paper II) comprises a two-hour written exam set and marked by MATSEC at the end of the three-year programme.

The paper will carry a total of 100 marks and will be set at Level 1-2-3. It will include questions based on a number of knowledge or comprehension criteria from different units, learning outcomes and levels.

Attainment in this component will be reported by MATSEC as a Grade using an 8-point scale and will contribute towards 40% of the marks in determining the overall level.

Candidates are to fulfil the set criteria in this assessment component to obtain a level higher than Level 1.

CONTROLLED ASSESSMENT IN YEAR 11	LEVEL WEIGHT (OVERALL SUBJECT MARK)
Two-hour exam paper	40%
[0 to 100] marks	

Unit 1: Plant and Soil Science

Unit Description

Horticulture consists of the science, technology and business involved in the cultivation of fruit, vegetables, grapevines, olives, and other similar crops.

Candidates will be introduced to plant morphology and life cycles. In this unit candidates will also understand the basics of horticultural production and trends.

In addition, candidates will become familiar with plant nutrient requirements and fertilisation together with the common soil types, the basics of soil sampling and simple soil analysis techniques.

Learning Outcomes

At the end of the unit, I can:

- LO 1.** Demonstrate an understanding of the life cycle and morphologies of different organs of crop/ornamental plants' roots and shoot systems.
- LO 2.** Demonstrate an understanding of Health and Safety in agribusiness.
- LO 3.** Undertake a season's growth of different groups of vegetables.
- LO 4.** Apply a suitable fertiliser using the appropriate technique.
- LO 5.** Demonstrate an understanding of the purpose and methods used for soil analysis.
- LO 6.** Demonstrate an understanding of the soil factors which contribute to healthy plant growth.

Assessment Criteria and Content

Subject Focus	The plant body		
LO 1.	Demonstrate an understanding of the life cycle and morphologies of different organs of crop/ornamental plants' roots and shoot systems.		
K-1.	K-1. Identify main organs of a typical flowering plant.	K-1. Label different organs of crop/ornamental plants' roots and shoot systems.	K-1. Identify different specialised versions of different crop/ornamental plants' organs.
	Main organs of a typical flowering plant: e.g. stem, root, leaf, fruit, flower, seed.		
	Organs of crop/ornamental plants' roots and shoot systems: e.g. stem, root, leaf, fruit, flower, seed, flower bud, apical bud.		
Specialised versions of crop/ornamental plants' organs: e.g. rhizomes (underground stems), stem tubers, root tubers, apical/apex bud, lateral/axillary buds, lateral roots, tap root.			
K-2.	K-2. Label the different plant cell components.	K-2. Outline the role of the different plant cell components.	K-2. Describe the functions and arrangement of the plant's transport systems in dicots.
	Plant cell components: e.g. cell wall, cell membrane, nucleus, cytoplasm, vacuole, mitochondria, chloroplasts.		
Transport systems in dicots: xylem; phloem.			
K-3.	K-3. Organise the stages of the life cycle of a named crop species.	K-3. Outline the stages of the life cycle of a named crop species.	K-3. Compare insect and wind pollination.
	Stages of a crop lifecycle: germination; seedling; flowering; pollination; fertilisation; fruiting; seed dispersal.		
Wind and insect pollinated flowers: petals; reproductive organs; pollen quantity; scent; nectar.			
C-1.	C-1. Classify leaves and flowers of monocotyledons and dicotyledons.	C-1. Describe the role of different rooting systems.	C-1. Explain the beneficial role of root nodules in legume roots.
	Role of rooting systems: anchorage; water and nutrient absorption; storage.		

Subject Focus	Health and Safety		
LO 2.	Demonstrate an understanding of Health and Safety in agribusiness.		
K-4.	K-4. Match different types of risks with hazards in a crop production enterprise.	K-4. List the information needed when calling for help in an emergency.	K-4. State reasons for maintaining Health and Safety measures in crop production enterprise.
	<p>Hazards and risks in a crop production enterprise:</p> <ul style="list-style-type: none"> • Hazards: e.g. sharp objects, biohazards, tools and machinery, fuel, electricity, direct sunlight, not wearing the appropriate PPEs, pesticides and fertilisers, lifting heavy objects, dust; • Risks: e.g. cuts, burns, infections, poisoning, electric shock, heat stroke, back injury, eye irritation, respiratory problems. 		
	Information needed when calling for help in an emergency: emergency number; location of accident; number of people involved; description of the accident/injuries involved.		
	Reasons for maintaining Health and Safety measures: ensure safe working conditions; legal obligations.		
C-2.	C-2. Outline preventive measures required for maintaining a safe work environment in a crop production enterprise.	C-2. Describe the use of different items that should be present in a First Aid box according to legislation.	C-2. Explain ways of dealing with particular injuries.
	Preventive measures for maintaining a safe work environment: availability of personal protective equipment; training in Health and Safety on the workplace; perform a risk assessment; minimise hazards to the minimum.		
	First Aid box items: sterile dressings; triangular bandages; sterile eye wash; surgical gloves; roller bandages; personal protection shield for artificial breathing; gauze pads.		
	<p>Dealing with injuries: e.g.</p> <ul style="list-style-type: none"> • Burn: cool burn; apply sterile dressing, • Cut: apply pressure on the area; apply sterile dressing, • Poisoning: notice symptoms; notice consciousness, • Electric shock: do not touch person; if possible turn off source of electricity, • Heat stroke: take reading of body temperature; apply cool water, • Eye irritation: avoid rubbing eyes; flush with cool water. 		

Subject Focus	Growing vegetables		
LO 3.	Undertake a season's growth of different groups of vegetables.		
K-5.	K-5. Identify different crop types.	K-5. Outline different crop production types.	K-5. Describe the process from sowing/planting to harvesting of one named crop.
	Crop types: leafy crops; fruiting crops; tuberous crops; grains.		
	Crop production types: soil-less crop production; greenhouse production; outdoor production; organic crop production.		
	Considerations: soil requirements; planting method and spacing; irrigation system and intensity; general crop care. <i>N.B. For assessment purposes, ONE of the following crops should be considered: lettuce or cabbage or tomatoes or zucchini or broad beans or potatoes or onions.</i>		
K-6.	K-6. Define the term market in relation to agribusiness.	K-6. Define the terms demand and supply in relation to agribusiness.	K-6. Describe the role of different market actors.
	Market actors: producer; processors; consumer.		
C-3.	C-3. Outline reasons why harvesting date of a given crop deviates from the planned harvest date.	C-3. Calculate the number of seeds/plants of a single crop needed for a specific land area.	C-3. Justify the selection of a variety of a given crop for a given scenario.
	Calculating the number of seeds/plants: calculating length of row; establishing spacing; calculating the number of seeds/plants needed according to respective spacing.		
	Crop variety characteristics: yield; appearance; flavour; disease resistance; period of cultivation.		
A-1.	A-1. Carry out the necessary work to form a furrow with a ridge on each side in soil using appropriate tools and PPEs.	A-1. Sow/transplant the number of a plant/seeds needed for a specific land area according to your calculations.	A-1. Follow the correct procedure to set up a drip irrigation system for a specific land area.
	Tools: hoe and/or shovel; hoe and/or fork; hoe and/or stringline.		
	<i>N.B. For assessment purposes, furrow needs to be straight and at least 5m long.</i>		
	Sowing seeds or transplanting seedlings: depth; spacing. Drip irrigation system for a specific land area: attaching drip tape in the correct orientation; laying of drip tape; sealing off the drip tape. <i>N.B. For assessment purposes at all levels, a minimum length of 5m should be utilised for this criterion.</i>		
A-2.	A-2. Select the appropriate tools for a given plant nursery activity.	A-2. Practice routine work that is required for the production of a plant.	A-2. Practice routine plant nursery activities.
	Routine work for the production of a plant: e.g. de-weeding, crop monitoring; harvesting.		
	Plant nursery activities: preparation and sowing of a full seed tray seeded with one plant species; tray tag marking and watering; repotting from a seed tray/smaller pot to a larger pot; maintain the plant to maturity. <i>N.B. For assessment purposes at Level 3, only ornamental plants are to be considered.</i>		

Subject Focus	Soil fertility		
LO 4.	Apply a suitable fertiliser using the appropriate technique.		
K-7.	K-7. Define plant macronutrients and micronutrients.	K-7. Select the appropriate macronutrient/s for specific crop requirements.	K-7. Relate different deficiency symptoms to the missing nutrient/s causing them.
	Crop requirements: leaf growth; fruit turgidity; healthy flowering and fruiting; healthy rooting.		
	N.B. For assessment purposes, the following macronutrients should be considered: Nitrogen; Phosphorus; Potassium; Calcium; Magnesium; Sulfur.		
Deficiency symptoms: e.g. total leaf chlorosis of older leaves (N), leaf purpling (P), leaf margin necrosis (K).			
K-8.	K-8. List the different types of manure commonly used in the Maltese islands.	K-8. Outline the advantages and disadvantages of manure use in vegetable production.	K-8. Describe the storage and application requirements of manure according to the Nitrates Action Program.
	Manure types commonly used in the Maltese islands: cattle manure; goat and sheep manure; rabbit manure; poultry manure.		
	Advantages and disadvantages of using manure in vegetable production: <ul style="list-style-type: none"> • Advantages: e.g. nutrients, humus, improving soil texture; • Disadvantages: e.g. pathogens, weeds, nutrient leaching, storage difficulties. 		
	Storage and application requirements of manure according to the Nitrates Action Program: covered manure clamp; connected to cesspit; application prohibited between 15th October to 15th March; legal limit of manure (N) that can be applied on the field.		
A-3.	A-3. Use the correct procedure to take a soil sample required before applying fertiliser.	A-3. Measure water parameters using simple equipment required before applying fertiliser.	A-3. Apply the proper fertiliser using appropriate Health and Safety equipment.
	Water parameters: electrical conductivity; pH.		
	Calculation of macronutrient available to crop (total of macronutrient in soil and total of macronutrient in water); fertiliser need by crop (amount of macronutrient in fertiliser provided, difference between crop need and available macronutrient); Application of the fertiliser (measurement of appropriate fertiliser, appropriate application, correct use of PPE).		
N.B. For assessment purposes, macronutrient refers to Nitrogen (N), Phosphorus (P) or Potassium (K).			

Subject Focus	Soil analysis		
LO 5.	Demonstrate an understanding of the purpose and methods used for soil analysis.		
K-9.	K-9. List the tools required to take soil samples.	K-9. List the most commonly measured parameters in soil and water analysis.	K-9. Outline the importance of measuring soil and water parameters.
	Tools for taking soil samples: e.g. auger, hand drill, spade, bucket, labelled bag.		
	Commonly measured parameters in soil and water analysis: e.g. pH, sodium, chloride, nitrates, phosphorus, potassium, electrical conductivity, texture.		
	Importance of analysing soil and water parameters: suitability of irrigation water; selection of crop; appropriate fertilisation; meeting crop requirements.		
C-4.	C-4. Explain how a soil sample is taken.	C-4. Analyse the results of soil and water samples for electrical conductivity and pH.	C-4. Justify the selection of plants that are the most suitable for specific soil and water parameters according to the results of a soil/water sample.
	<p>Sampling soil: zig-zag pattern; depth of sample.</p> <p>Parameters:</p> <ul style="list-style-type: none"> • Water/Soil pH; • Water/Soil Conductivity; • Nitrogen; • Phosphorus; • Potassium. 		

Subject Focus	Soil properties		
LO 6.	Demonstrate an understanding of the soil factors which contribute to healthy plant growth.		
K-10.	K-10. Define soil fertility.	K-10. Outline the main characteristics of a typical Maltese soil.	K-10. Relate soil texture to water and nutrient availability.
	Main characteristics: alkalinity; poor organic matter content.		
	Soil texture: sandy; clayey; silty; loam.		
C-5.	C-5. Distinguish between biotic and abiotic soil factors.	C-5. Explain how given activities improve soil fertility.	C-5. Describe how biotic and abiotic soil factors can affect plant growth.
	<p>Activities: e.g. mulching, tilling, fertilisation, addition of manure, crop rotation, soil solarisation.</p> <p>Biotic and abiotic soil factors:</p> <ul style="list-style-type: none"> • Biotic: e.g. earthworms, pathogens, saprotrophic microorganisms, pests; • Abiotic: e.g. pH, soil water, soil texture, soil structure, soil temperature, organic matter, porosity, drainage. 		

Learning Outcomes and Assessment Criteria

Subject Focus:	The plant body
Learning Outcome 1:	Demonstrate an understanding of the life cycle and morphologies of different organs of crop/ornamental plants' roots and shoot systems.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-1. Identify main organs of a typical flowering plant.	K-1. Label different organs of crop/ornamental plants' roots and shoot systems.	K-1. Identify different specialised versions of different crop/ ornamental plants' organs.						
K-2. Label the different plant cell components.	K-2. Outline the role of the different plant cell components.	K-2. Describe the functions and arrangement of the plant's transport systems in dicots.	C-1. Classify leaves and flowers of monocotyledons and dicotyledons.	C-1. Describe the role of different rooting systems.	C-1. Explain the beneficial role of root nodules in legume roots.			
K-3. Organise the stages of the life cycle of a named crop species.	K-3. Outline the stages of the life cycle of a named crop species.	K-3. Compare insect and wind pollination.						

Subject Focus:	Health and Safety
Learning Outcome 2:	Demonstrate an understanding of Health and Safety in agribusiness.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-4. Match different types of risks with hazards in a crop production enterprise.	K-4. List the information needed when calling for help in an emergency.	K-4. State reasons for maintaining Health and Safety measures in crop production enterprise.	C-2. Outline preventive measures required for maintaining a safe work environment in a crop production enterprise.	C-2. Describe the use of different items that should be present in a First Aid box according to legislation.	C-2. Explain ways of dealing with particular injuries.			

Subject Focus:	Growing vegetables
Learning Outcome 3:	Undertake a season’s growth of different groups of vegetables.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-5. Identify different crop types.	K-5. Outline different crop production types.	K-5. Describe the process from sowing/planting to harvesting of one named crop.	C-3. Outline reasons why harvesting date of a given crop deviates from the planned harvest date.	C-3. Calculate the number of seeds/plants of a single crop needed for a specific land area.	C-3. Justify the selection of a variety of a given crop for a given scenario.	A-1. Carry out the necessary work to form a furrow with a ridge on each side in soil using appropriate tools and PPEs.	A-1. Sow/transplant the number of a plant/seeds needed for a specific land area according to your calculations.	A-1. Follow the correct procedure to set up a drip irrigation system for a specific land area.
K-6. Define the term market in relation to agribusiness.	K-6. Define the terms demand and supply in relation to agribusiness.	K-6. Describe the role of different market actors.				A-2. Select the appropriate tools for a given plant nursery activity.	A-2. Practice routine work that is required for the production of a plant.	A-2. Practice routine plant nursery activities.

Subject Focus:	Soil fertility
Learning Outcome 4:	Apply a suitable fertiliser using the appropriate technique.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-7. Define plant macronutrients and micronutrients.	K-7. Select the appropriate macronutrient/s for specific crop requirements.	K-7. Relate different deficiency symptoms to the missing nutrient/s causing them.				A-3. Use the correct procedure to take a soil sample required before applying fertiliser.	A-3. Measure water parameters using simple equipment required before applying fertiliser.	A-3. Apply the proper fertiliser using appropriate Health and Safety equipment.
K-8. List the different types of manure commonly used in the Maltese islands.	K-8. Outline the advantages and disadvantages of manure use in vegetable production.	K-8. Describe the storage and application requirements of manure according to the Nitrates Action Program.						

Subject Focus:	Soil analysis
Learning Outcome 5:	Demonstrate an understanding of the purpose and methods used for soil analysis.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-9. List the tools required to take soil samples.	K-9. List the most commonly measured parameters in soil and water analysis.	K-9. Outline the importance of measuring soil and water parameters.	C-4. Explain how a soil sample is taken.	C-4. Analyse the results of soil and water samples for electrical conductivity and pH.	C-4. Justify the selection of plants that are the most suitable for specific soil and water parameters according to the results of a soil/water sample.			

Subject Focus:	Soil properties
Learning Outcome 6:	Demonstrate an understanding of the soil factors which contribute to healthy plant growth.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-10. Define soil fertility.	K-10. Outline the main characteristics of a typical Maltese soil.	K-10. Relate soil texture to water and nutrient availability.	C-5. Distinguish between biotic and abiotic soil factors.	C-5. Explain how given activities improve soil fertility.	C-5. Describe how biotic and abiotic soil factors can affect plant growth.			

Unit 2: Aquatic and Land Based Production

Unit Description

The objective of this unit is to build upon the land-based production knowledge, skills and competences covered in Unit 1 and introduce new concepts on aquatic production.

Through this unit candidates will be introduced to basic fish care techniques. They will be given an overview of the morphology and nutritional requirements of different fish species together with fish diseases and disorders, their prevention, and cure.

Furthermore, in this unit candidates will become familiar with the major physiological processes of plants such as germination, photosynthesis and transpiration. The major tasks required for vegetable cultivation and propagation will also be tackled.

Learning Outcomes

At the end of the unit, I can:

- LO 7.** Demonstrate an understanding of the morphology and nutritional requirements of different fish species.
- LO 8.** Undertake proper fish husbandry tasks to prevent and cure diseases and correct disorders.
- LO 9.** Describe the main processes of plant physiology.
- LO 10.** Conduct post-harvesting processes according to marketing standards.
- LO 11.** Explain the propagation requirements and growth media for different plants.

Assessment Criteria and Content

Subject Focus	Different fish and fish diets		
LO 7.	Demonstrate an understanding of the morphology and nutritional requirements of different fish species.		
K-11.	K-11. Match fish species to their respective habitat.	K-11. Label the general morphology of a typical fish.	K-11. Outline various fish habitats in terms of salinity and temperature.
	Fish species: e.g. goldfish, angel fish, African cichlid, guppy, sea bream, tuna, clown fish.		
	Fish morphology: <ul style="list-style-type: none"> Internal: e.g. skeleton, swim bladder, heart, gills, brain, intestines, reproductive organs, stomach, urinary bladder; External: e.g. head, dorsal fin, caudal fin, pelvic fin, pectoral fin, anal fin, scales, lateral line, anus. 		
	Fish habitats: e.g. cold fresh water, tropical planted fresh water, tropical stone-scape fresh water, brackish, marine Mediterranean, marine tropical. N.B. Salinity levels to be limited to low, medium and high.		
K-12.	K-12. List the nutrients required for fish to grow.	K-12. Describe the different feeds used in fish husbandry.	K-12. Outline the roles of various nutrients for healthy fish growth.
	Nutrients required for fish growth: e.g. proteins, carbohydrates, fat, fibre, vitamins, minerals.		
	Feeds used in fish husbandry: live feed; dry feed; fresh feed; frozen feed.		
C-6.	C-6. Describe the importance of using live feed in fry/larva.	C-6. Explain why fish have different nutritional requirements at specific life stages.	C-6. Select feeds for healthy fish growth at different life stages of a given species.
	Importance of live feed in fry/larva: size of fish mouth; instinct.		
	Life stages and nutritional requirements: <ul style="list-style-type: none"> Life stages: e.g. larva/fry, juvenile, adult; Nutritional requirements: e.g. proteins, carbohydrates, fats. 		
	Feeds for healthy fish growth: daphnia and/or artemia and/or flakes and/or pellets and/or granules. N.B. For assessment purposes, ONE of the following fish species should be considered: African cichlids or Angel fish.		

Subject Focus	Maintaining fish		
LO 8.	Undertake proper fish husbandry tasks to prevent and cure diseases and correct disorders.		
K-13.	K-13. List the most common fish health problems.	K-13. Outline the symptoms of the most common fish health problems.	K-13. Identify a correct treatment procedure to control fish health problems.
	Fish health problems: e.g. fin rot, swim bladder disease, ich.		
K-14.	K-14. Outline the use of basic accessories required in setting up a typical aquarium or tank.	K-14. Outline the need for décor and lighting components in the setting up of an aquarium.	K-14. Describe the cage requirements of an edible fish species.
	Basic accessories in setting up a typical aquarium or tank: heater; chiller; water pump; air pump; filter.		
	Décor and lighting components: e.g. substrate, rocks, live plants, artificial plants, lighting.		
	Cage requirements: size; location. N.B. For assessment purposes, the following fish should be used at Level 3: sea bream or tuna.		
C-7.	C-7. Outline reasons that should be considered when selecting a given aquarium size for a given fish species.	C-7. Explain the benefits of water change of a fish tank.	C-7. Discuss the importance of the right aquarium décor in relation to fish health.
	Reasons when selecting a particular aquarium size: fish size; aggression; fish waste production.		
	N.B. For assessment purposes, the following fish species should be considered: goldfish or African cichlids or angel fish or guppy or clown fish.		
	Benefits of a water change: reduction of nitrogenous pollutants; replenish trace minerals; control water clarity; removal of decomposing organic material.		
Aquarium décor in relation to fish health: e.g. substrate, rocks, plants.			
A-4.	A-4. Set-up an aquarium with the necessary life supporting equipment according to the selected fish requirements.	A-4. Prepare the aquarium to make it suitable to host fish.	A-4. Perform routine tasks in the maintenance and upkeep of a fish tank taking into consideration Health and Safety aspects.
	Setting-up suitable life supporting equipment for selected fish requirements: filtration and aeration; temperature control; décor and lighting.		
	Preparation of aquarium: set water conditions for selected fish; set-up nitrogen cycle; test chemical levels.		
Routine tasks in maintaining and up-keeping a fish tank: wash hands; handle chemicals with care; feeding; water changes; water testing; cleaning of glass; monitoring of fish and equipment.			

Subject Focus	Plant control and protection		
LO 9.	Describe the main processes of plant physiology.		
K-15.	K-15. Outline the flow of water from soil to leaf.	K-15. Explain the role of the stomata in the process of transpiration.	K-15. Outline the implications of transpiration in plant production.
	Flow of water from soil to leaf: osmosis; water uptake by roots; water travels up through xylem; water reaches leaves.		
	Transpiration of water: water evaporates and transpires into the atmosphere through stomata.		
	Implications of transpiration: irrigation frequency to avoid water stress; avoids overheating; uptake of minerals; entry of carbon dioxide.		
K-16.	K-16. Define photosynthesis.	K-16. Outline the factors affecting the rate of photosynthesis.	K-16. Describe how a plant reacts to external stimuli to maximise photosynthesis.
	Factors affecting the rate of photosynthesis: light intensity; carbon dioxide concentration; temperature; water availability.		
	External stimuli: light direction; gravity.		
K-17.	K-17. List the most common biotic and abiotic factors leading to plant health problems.	K-17. Differentiate visible symptoms leading to plant damage caused by pests and diseases.	K-17. Describe a suitable treatment required to cure a given plant health problem.
	Biotic and abiotic factors: <ul style="list-style-type: none"> • Biotic: pests; diseases; • Abiotic: physiological disorders. 		
	Pests and diseases: <ul style="list-style-type: none"> • Pests: caterpillars; cut-worms; • Diseases: rust; late blight. 		
C-8.	C-8. Explain how the environment can be modified in a protected cultivation.	C-8. Outline the advantages and disadvantages of drip and sprinkler irrigation systems.	C-8. Discuss how light or temperature can be used to control plant processes in horticulture.
	Modifications to the environment in a protected cultivation: e.g. light, temperature, humidity.		
	Using light or temperature to control the following plant processes: e.g. germination, growth rate, flowering.		
C-9.	C-9. Distinguish between different types of plant protection products.	C-9. Explain preventive measures necessary for good pest and disease control.	C-9. Explain good practices when applying plant protection measures.
	Plant protection products: synthetic chemicals; chemicals derived from natural products; biological; cultural.		
	Preventive measures: e.g. crop rotation, disease-free seeds, removal of crop waste/infected plants, cultivation timing.		
	Good practices in applying plant protection measures: e.g. use of PPE, keeping records, application during favourable weather, observe recommendations on label, respect pre-harvest time window, check for compatibility issues.		

Subject Focus	Post-harvest practices		
LO 10.	Conduct post-harvesting processes according to marketing standards.		
K-18.	K-18. List the factors that contribute towards natural product spoilage and decay.	K-18. Outline practices that slow down the process of natural product spoilage and decay.	K-18. Outline reasons for choosing a particular packaging for a specific product.
	Factors that contribute towards spoilage and decay: heat; humidity; poor hygiene; un-suitable storage; transportation media.		
	Practices that slow down spoilage and decay: reduction in time from harvest to storage; packaging; rapid reduction in temperature; suitable storage; good hygiene.		
	Suitable packaging for different products: e.g. lettuce, potatoes, herbs, soft fruits.		
C-10.	C-10. Outline the importance of keeping suitable levels of hygiene in post- harvesting processes.	C-10. Explain post-harvest processes required to present the product on the market.	C-10. Explain the importance of ensuring traceability in the food supply chain.
	Post-harvesting processes: grading; cleaning; processing; packaging; labelling.		
A-5.	A-5. Grade a clean product according to market needs.	A-5. Present the product in the appropriate packaging for retail.	A-5. Produce a label which is attractive to the consumer for a packaged product.
	Grading a clean product: e.g. colour, deformations, damages, size, firmness.		
	Presentation of product: size of packaging; material of packaging; cleanliness (subjective to product type).		
Label: name of product; origin; weight; date of harvest; batch number; branding.			

Subject Focus	Producing new plants		
LO 11.	Explain the propagation requirements and growth media for different plants.		
K-19.	K-19. Mention the different types of germination.	K-19. Outline different conditions required for optimum propagation of plants.	K-19. Describe different propagation techniques used for different plants.
	Types of germination: epigeal; hypogeal.		
	Ideal conditions for propagation: sheltering; water availability; temperature; humidity; free from pathogens/pests, suitable growing medium.		
Propagation techniques: e.g. seeding, stem cutting, stem tuber cutting, grafting, layering.			
K-20.	K-20. List different growing media used for plant propagation and growth.	K-20. State suitable growing media for different applications in horticulture.	K-20. Outline characteristics of a selected growing medium used in horticulture.
	Growing media used for plant propagation and growth: e.g. compost, coconut coir, expanded clay, rockwool®, perlite.		
	Applications of growing media in horticulture: production of seedlings; hydroponics; ornamental planting in pots.		
Characteristics of growing medium: water drainage; pathogen/pest free; nutrient-holding capacity; aeration.			
A-6.	A-6. Prepare tools needed to take cuttings.	A-6. Use the correct procedure to propagate a plant by cuttings.	A-6. Maintain a number of cuttings to produce a viable propagated plant.
	Tool preparation: choosing the right tool; cleaning; disinfection.		
	Procedure to propagate a plant by cuttings: selection of branches for good cuttings; selection of suitable point on the branch for viable cutting; clean cutting at correct angle.		
Maintenance to produce a viable propagated plant by cuttings: suitable growing medium; use of rooting powder; regular watering; inspection for signs of pathogens/pests.			

N.B. No marks should be awarded in any application criteria unless candidates are wearing all appropriate clothing and PPE (including gloves) during practical work, and Health and Safety practices are strictly abided-to!

Learning Outcomes and Assessment Criteria

Subject Focus:	Different fish and fish diets
Learning Outcome 7:	Demonstrate an understanding of the morphology and nutritional requirements of different fish species.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-11. Match fish species to their respective habitat.	K-11. Label the general morphology of a typical fish.	K-11. Outline various fish habitats in terms of salinity and temperature.						
K-12. List the nutrients required for fish to grow.	K-12. Describe the different feeds used in fish husbandry.	K-12. Outline the roles of various nutrients for healthy fish growth.	C-6. Describe the importance of using live feed in fry/larva.	C-6. Explain why fish have different nutritional requirements at specific life stages.	C-6. Select feeds for healthy fish growth at different life stages of a given species.			

Subject Focus:	Maintaining Fish
Learning Outcome 8:	Undertake proper fish husbandry tasks to prevent and cure diseases and correct disorders.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-13. List the most common fish health problems.	K-13. Outline the symptoms of the most common fish health problems.	K-13. Identify a correct treatment procedure to control fish health problems.	C-7. Outline reasons that should be considered when selecting a given aquarium size for a given fish species.	C-7. Explain the benefits of water change of a fish tank.	C-7. Discuss the importance of the right aquarium décor in relation to fish health.	A-4. Set-up an aquarium with the necessary life supporting equipment according to the selected fish requirements.	A-4. Prepare the aquarium to make it suitable to host fish.	A-4. Perform routine tasks in the maintenance and upkeep of a fish tank taking into consideration Health and Safety aspects.
K-14. Outline the use of basic accessories required in setting up a typical aquarium or tank.	K-14. Outline the need for décor and lighting components in the setting up of an aquarium.	K-14. Describe the cage requirements of an edible fish species.						

Subject Focus:	Plant control and protection
Learning Outcome 9:	Describe the main processes of plant physiology.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-15. Outline the flow of water from soil to leaf.	K-15. Explain the role of the stomata in the process of transpiration.	K-15. Outline the implications of transpiration in plant production.	C-8. Explain how the environment can be modified in a protected cultivation.	C-8. Outline the advantages and disadvantages of drip and sprinkler irrigation systems.	C-8. Discuss how light or temperature can be used to control plant processes in horticulture.			
K-16. Define photosynthesis.	K-16. Outline the factors affecting the rate of photosynthesis.	K-16. Describe how a plant reacts to external stimuli to maximise photosynthesis.						
K-17. List the most common biotic and abiotic factors leading to plant health problems.	K-17. Differentiate visible symptoms leading to plant damage caused by pests and diseases.	K-17. Describe a suitable treatment required to cure a given plant health problem.	C-9. Distinguish between different types of plant protection products.	C-9. Explain preventive measures necessary for good pest and disease control.	C-9. Explain good practices when applying plant protection measures.			

Subject Focus:	Post-harvest practices
Learning Outcome 10:	Conduct post-harvesting processes according to marketing standards.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-18. List the factors that contribute towards natural product spoilage and decay.	K-18. Outline practices that slow down the process of natural product spoilage and decay.	K-18. Outline reasons for choosing a particular packaging for a specific product.	C-10. Outline the importance of keeping suitable levels of hygiene in post-harvesting processes.	C-10. Explain post-harvest processes required to present the product on the market.	C-10. Explain the importance of ensuring traceability in the food supply chain.	A-5. Grade a clean product according to market needs.	A-5. Present the product in the appropriate packaging for retail.	A-5. Produce a label which is attractive to the consumer for a packaged product.

Subject Focus:	Producing new plants
Learning Outcome 11:	Explain the propagation requirements and growth media for different plants.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-19. Mention the different types of germination.	K-19. Outline different conditions required for optimum propagation of plants.	K-19. Describe different propagation techniques used for different plants.						
K-20. List different growing media used for plant propagation and growth.	K-20. State suitable growing media for different applications in horticulture.	K-20. Outline characteristics of a selected growing medium used in horticulture.				A-6. Prepare tools needed to take cuttings.	A-6. Use the correct procedure to propagate a plant by cuttings.	A-6. Maintain a number of cuttings to produce a viable propagated plant.

Unit 3: Rabbit Care and Genetics

Unit Description

The breeding of rabbits is considered as a key agribusiness sector in Malta. Rabbit is an important ingredient in Maltese cuisine and also a very popular pet.

This unit will assist candidates to become familiar with the care required in the breeding of rabbits. An insight of the origin, history and process of domestication of rabbits shall be provided.

Candidates will explore the requirements for breeding rabbits in terms of feed, water and micro-climatic conditions. They shall be exposed to specific housing requirements and equipment, and will also be guided in considering the economic significance and production features of different breeds and hybrids of rabbits.

Through this unit, candidates shall be exposed to rabbit morphology, reproduction, physiology, genetics, specific diseases, disorders and their treatment.

Learning Outcomes

At the end of the unit, I can:

- LO 12.** Demonstrate an understanding of the biology and genetic principles of rabbit production.
- LO 13.** Maintain the right environment for rabbit husbandry.
- LO 14.** Use adequate preventive and curative measures for healthy rabbit growth.
- LO 15.** Explain the reproductive phases and breeding of rabbits.
- LO 16.** Demonstrate an understanding of the ways rabbits can be processed to enhance revenues of a rabbit farm.

Assessment Criteria and Content

Subject Focus	Rabbit biology		
LO 12.	Demonstrate an understanding of the biology and genetic principles of rabbit production.		
K-21.	K-21. List the different levels of organisation in a living organism.	K-21. Match organ/s with the respective rabbit's body systems.	K-21. Describe the main function of a rabbit's body system.
	<p>Levels of organisation in a living organism: cells; tissues; organs; systems.</p> <p>Rabbit's main body systems: e.g. circulatory system (heart and blood), respiratory system (lungs), excretory system (kidneys), digestive system (liver, stomach, caecum, intestines), nervous system (brain), reproductive system (Reproductive organs in males including penis, testes, prostate, seminal vesicle, urethra; Reproductive organs in females including ovaries, vulva, uterus, cervix, vagina).</p>		
K-22.	K-22. Identify the most common rabbit breeds.	K-22. Match rabbit breeds with their breeding purpose.	K-22. Describe features in relation to breeding purpose.
	<p>Common rabbit breeds:</p> <ul style="list-style-type: none"> • Meat Market: New Zealand White; Californian; • Pet/Fur: Netherland dwarf; Lionhead; Flemish giant; Rex; Angora. <p>Features related to breeding purpose:</p> <ul style="list-style-type: none"> • Meat Market: rapid growth and maturation; high muscle to bone ratio; • Pet/Fur: long life span; dense and homogenous coat. 		
K-23.	K-23. State the difference between sexual and asexual reproduction.	K-23. Match genetics-related terms with their definition.	K-23. Outline the main features of sexual reproduction.
	<p>Genetics-related terms: e.g. DNA, gamete, gene, allele, chromosome.</p> <p>Features of sexual reproduction: male and female parents; formation of gametes; fertilisation; genetically unique off-spring.</p>		
C-11.	C-11. Define F1 and F2 generations.	C-11. Distinguish between different types of genotypes.	C-11. Calculate the probability of different phenotypes in the F1 and F2 generations.
	<p>Types of genotypes: homozygous dominant; homozygous recessive; heterozygous; co-dominance.</p> <p>Distribution of traits in F1 and F2 using genetic diagrams: genetic cross diagram or punnet square diagram.</p>		

Subject Focus	Rabbit husbandry		
LO 13.	Maintain the right environment for rabbit husbandry.		
K-24.	K-24. Outline the stages of commercial rabbit husbandry.	K-24. List the equipment necessary to maintain adequate microclimatic conditions in a rabbitry.	K-24. Describe favourable microclimatic conditions for growing rabbits.
	Stages of commercial rabbit husbandry: kit; weaning; fattening; adult/parent stock.		
	Equipment necessary to maintain adequate microclimatic conditions: extractors; fans; heaters/chillers; lighting system.		
Favourable microclimatic conditions for growing rabbits: quality of air/ventilation; temperature; lighting; humidity.			
K-25.	K-25. List common ingredients found in rabbit feed.	K-25. List the different feeds used in rabbit husbandry.	K-25. Outline the function of given nutrients for healthy rabbit growth.
	Ingredients: e.g. wheat, soya, maize, barley, other legumes, oils, minerals, vitamins.		
	Feeds: e.g. weaning feed, fattening feed, medicated feed, doe feed, maintenance feed, pet rabbit feed.		
Given nutrients: proteins; carbohydrates; fibre; fat.			
C-12.	C-12. Select the equipment that is used for commercial rabbit breeding.	C-12. Select cage requirements for a lactating doe within a commercial rabbitry.	C-12. Suggest changes that should be implemented in a given site to make it suitable for commercial rabbit production.
	Equipment: e.g. drinkers, hoppers, manure conveyer, power washer, scrapers, steam cleaner, gas burner, wire brush.		
	Cage requirements: e.g. kindling box, plastic slat floor, separator between box and main cage, shutter in separator, position of drinker; type of drinker.		
N.B. The given site is already supplied with electrical, water and drain connection.			
A-7.	A-7. Use the correct biosecurity protocol to undertake tasks in a rabbitry.	A-7. Maintain a clean and hygienic environment in a rabbit production unit.	A-7. Undertake routine tasks in a working rabbitry.
	Biosecurity measures: wear appropriate PPEs; wash hands before and after entry in rabbitry; make use of disinfecting floor mats; clean tools after use.		
	N.B. The school should have a basic biosecurity protocol in place according to the exigencies of the farm. This protocol should be communicated to candidates and adhered to when undertaking rabbitry tasks.		
	Maintaining a clean and hygienic environment: cleaning of cages; removal of excrement and cleaning of floors; disinfection of drinker/feeder system.		
Routine tasks in a working rabbitry: feed rabbits; monitor livestock health; prepare and/or clean and inspect nesting boxes; record inspection of rabbitry equipment for wear and tear.			

Subject Focus	Rabbit pests, diseases and disorders		
LO 14.	Use adequate preventive and curative measures for healthy rabbit growth.		
K-26.	K-26. List common rabbit health conditions.	K-26. Identify signs of common rabbit health conditions.	K-26. Outline different rabbit medicinal routes used for preventive and curative treatments.
	Rabbit health conditions: e.g. viral haemorrhagic disease, mites and fleas, buck teeth, sore hocks, ring worm.		
	Rabbit medicinal routes: oral-dissolving in water; medical feeds; injectable; topical.		
C-13.	C-13. Outline how unfavourable environmental conditions influence overall rabbit health.	C-13. Identify the correct treatment procedure to control the most common rabbit diseases and disorders.	C-13. Discuss the proper preventive and biosecurity measures for different diseases, disorders and pests.
	Unfavourable environmental conditions influencing rabbit health: quality of air/ventilation; temperature; lighting; humidity; noise.		
	Treatment procedures to control most common diseases and disorders: <ul style="list-style-type: none"> • Viral haemorrhagic disease: culling; • Buckteeth: cutting the teeth with sharp pliers to the gums; • Sorehocks: applying disinfectants; • Mites and fleas: insecticidal spray/injection; • Ring worm: culling/topical treatment. 		
	Preventive and biosecurity measures: e.g. cleaning, vaccinations, regular inspection, proper microclimatic and housing conditions, good record keeping, adequate feeding, clean and disinfect water system, good feed storage, farm disinfection.		
A-8.	A-8. Use the correct procedure in handling a rabbit.	A-8. Monitor a rabbit's health condition to assess current status.	A-8. Assist in the administration and record of a vaccination of rabbit.
	Handling a rabbit: approaching; neck grab; weight support.		
	Monitoring a rabbit's health condition: <ul style="list-style-type: none"> • Free from disease, disorders and pests by checking: eyes; ears; teeth; nose; genitals; rear; tail; coat; paws; body temperature; • Normal appetite; • Vaccinations; 		
	Administering and recording of vaccinations: identification of site for vaccine; handling and disposal of needles; recording vaccination.		

Subject Focus	Rabbit reproduction		
LO 15.	Explain the reproductive phases and breeding of rabbits.		
K-27.	K-27. List rabbits' behaviour and anatomical features in relation to reproduction.	K-27. Match breeding intensity with the weaning and re-breeding protocol.	K-27. Outline the steps involved in a commercial rabbit breeding system.
	Behaviour and anatomical features of rabbits in relation to reproduction: <ul style="list-style-type: none"> • Behaviour: <ul style="list-style-type: none"> ○ Males: spraying of urine; ○ Females: assume lordosis; • Anatomical features: <ul style="list-style-type: none"> ○ Males: well developed genitals; ○ Females: vulva becomes red. 		
	Breeding intensity: intensive; semi-intensive; extensive. Weaning and re-breeding protocol: based on number of days from kindling.		
	Steps involved in a commercial rabbit breeding system: select parent stock; place doe in buck's cage for mating; place nest in doe's cage on the 24th day from mating; clean nest trays regularly; wean depending on breeding intensity.		
A-9.	A-9. Examine a rabbit to determine its sex.	A-9. Check whether a given rabbit has the necessary features for commercial rabbit breeding.	A-9. Conduct a basic reproductive scheme for commercial rabbits.
	Examination of a rabbit: handling rabbit; positioning rabbit; identifying genitals.		
	Features for the selection of commercial rabbits for breeding: <ul style="list-style-type: none"> • General characteristics: animals having desirable traits; free from disease; good blood lines; does not have records showing defects/problems; • Males: at least six months old; in possession of robust and good muscular structure with well visible testes; • Females: between 4 kg and 4.5 kg; mother weans a good number of kits per litter. 		
Reproductive scheme for commercial rabbits: planning of scheme in relation to the breeding intensity; copulation (with particular attention to when the process has terminated); preparation of nest; cleaning of nest upon kindling; counting of kits; weaning.			

Subject Focus	The rabbit business		
LO 16.	Demonstrate an understanding of the ways rabbits can be processed to enhance revenues of a rabbit farm.		
K-28.	K-28. List different methods of rabbit slaughtering.	K-28. List various methods of presenting rabbit meat to the consumer.	K-28. Outline factors that must be taken into consideration before establishing a market price.
	Different methods of rabbit slaughtering: stunning; dislocation; halal; striking.		
	Presentation methods of rabbit meat: whole rabbit, cuts, deboned, ground, product creation (e.g. sausages, burgers, etc.).		
	Factors to consider for establishing a market price: capital costs; running costs; competitors' price; consumers' willingness to pay; profit margin; product diversification; product presentation; consumer demands.		

Learning Outcomes and Assessment Criteria

Subject Focus:	Rabbit biology
Learning Outcome 12:	Demonstrate an understanding of the biology and genetic principles of rabbit production.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-21. List the different levels of organisation in a living organism.	K-21. Match organ/s with the respective rabbit's body systems.	K-21. Describe the main function of a rabbit's body system.	C-11. Define F1 and F2 generations.	C-11. Distinguish between different types of genotypes.	C-11. Calculate the probability of different phenotypes in the F1 and F2 generations.			
K-22. Identify the most common rabbit breeds.	K-22. Match rabbit breeds with their breeding purpose.	K-22. Describe features in relation to breeding purpose.						
K-23. State the difference between sexual and asexual reproduction.	K-23. Match genetics-related terms with their definition.	K-23. Outline the main features of sexual reproduction.						

Subject Focus:	Rabbit husbandry
Learning Outcome 13:	Maintain the right environment for rabbit husbandry.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-24. Outline the stages of commercial rabbit husbandry.	K-24. List the equipment necessary to maintain adequate microclimatic conditions in a rabbitry.	K-24. Describe favourable microclimatic conditions for growing rabbits.	C-12. Select the equipment that is used for commercial rabbit breeding.	C-12. Select cage requirements for a lactating doe within a commercial rabbitry.	C-12. Suggest changes that should be implemented in a given site to make it suitable for commercial rabbit production.	A-7. Use the correct biosecurity protocol to undertake tasks in a rabbitry.	A-7. Maintain a clean and hygienic environment in a rabbit production unit.	A-7. Undertake routine tasks in a working rabbitry.
K-25. List common ingredients found in rabbit feed.	K-25. List the different feeds used in rabbit husbandry.	K-25. Outline the function of given nutrients for healthy rabbit growth.						

Subject Focus:	Rabbit pests, diseases and disorders
Learning Outcome 14:	Use adequate preventive and curative measures for healthy rabbit growth.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-26. List common rabbit health conditions.	K-26. Identify signs of common rabbit health conditions.	K-26. Outline different rabbit medicinal routes used for preventive and curative treatments.	C-13. Outline how unfavourable environmental conditions influence overall rabbit health.	C-13. Identify the correct treatment procedure to control the most common rabbit diseases and disorders.	C-13. Discuss the proper preventive and biosecurity measures for different diseases, disorders and pests.	A-8. Use the correct procedure in handling a rabbit.	A-8. Monitor a rabbit's health condition to assess current status.	A-8. Assist in the administration and record of a vaccination of rabbit.

Subject Focus:	Rabbit reproduction
Learning Outcome 15:	Explain the reproductive phases and breeding of rabbits.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-27. List rabbits' behaviour and anatomical features in relation to reproduction.	K-27. Match breeding intensity with the weaning and re-breeding protocol.	K-27. Outline the steps involved in a commercial rabbit breeding system.				A-9. Examine a rabbit to determine its sex.	A-9. Check whether a given rabbit has the necessary features for commercial rabbit breeding.	A-9. Conduct a basic reproductive scheme for commercial rabbits.

Subject Focus:	The rabbit business
Learning Outcome 16:	Demonstrate an understanding of the ways rabbits can be processed to enhance revenues of a rabbit farm.

Knowledge Criteria			Comprehension Criteria			Application Criteria		
Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)	Assessment Criteria (Level 1)	Assessment Criteria (Level 2)	Assessment Criteria (Level 3)
K-28. List different methods of rabbit slaughtering.	K-28. List various methods of presenting rabbit meat to the consumer.	K-28. Outline factors that must be taken into consideration before establishing a market price.						

Appendix 1 – Minimum Required Resources

These resources should be available for at least 16 candidates.

General Requirements

- Preferably, minimum 2 tumuli of arable land and suitable for cultivation
- Greenhouse/propagation house
- Manure clamp
- Cesspit
- Storage for agricultural machinery
- Storage for fertiliser and pesticides
- Storage for fodder and animal feed
- Class room with interactive monitor or LCD projector
- Dressing rooms with lockers
- Toilets with shower
- Running water
- Adequate supply of second class water for irrigation

Rabbitry

- Flat deck breeder cages
- Extractor
- Fly zapper
- Rabbit scales up to 10 kg
- Hygrometer + Thermometer
- Drainage system to cesspit
- Buffer tank 50 litres
- Light fixtures with timer
- Sink - with hot and cold water
- Rabbit cages with nest boxes, feeder and automatic nipple drinkers

Fish Room

- Aquariums with capacity of 45 – 50 lit (volume of water) complete with light, filters and heater
- Aquariums with capacity of 110 – 130 lit (volume of water) complete with light, filters and heater
- Nano-quarantine/hospital tanks (15 – 20 lit)
- Hydrometer/salinometer
- Large breeders
- Aquarium thermometers
- Aquarium immersion heaters
- Water testing set
- Water testing strips cans
- Aquarium magnetic glass cleaners
- Airstones
- Airline elbows
- Airline tees
- Airline pressure regulators
- Airline non-return valves

- Aquarium submersible pump for water changes
- Air pumps
- Fish nets

Tools and Machinery

- String trimmer
- Chainsaw
- Petrol transport tank
- Diesel transport tanks
- Irrigation pipe punch
- Battery operated sprayer
- Industrial bins
- Manual sulphurator
- Pesticide face mask
- Grass cutting apron
- Ear muffs
- Grass cutting visor
- Wheel burrow
- Watering can
- Chainsaw
- String trimmer
- Diesel rotovator
- Inter row cultivator
- 10-20L rotary fertiliser/seed spreader
- Shovel head hoe (zappun)
- Hoe (mgħażqa)
- Fork hoe
- Dibbers
- Riddle
- Rake
- Pruning shears (secateurs)
- Lopper
- Spades
- Garden trowels
- Grafter knife
- Pruning saws
- Sickles
- Folding hand saws
- Pocket knife
- Hammer
- Sledge hammer
- Side cutter
- Heavy duty craft knife
- Wire brushes
- Large shifting spanner

- Hack saw
- Screw drivers set
- Pliers
- Spanner set
- Allen keys
- Socket ratchet
- Heavy duty shelving
- Sack trolley
- Long nose pliers
- Adjustable spanner
- Drill bits
- Measuring tape
- Cordless hammer drill
- PVC pipe cutter
- Gas flame torch burner
- Flint spark lighter
- Refillable LPG cylinder

Irrigation System

- Agricultural sprinklers (friefet)
- Drip tape
- Irrigation pipes and several fittings
- Ball valves
- Submersible/centrifugal irrigation pump and several fittings
- Adjustable fertiliser dozers or water powered dosers
- Irrigation timer

Scientific Apparatus

- Soil testing kit
- pH soil/temp probe
- One piece regular soil auger
- Microscope slides*
- USB microscope pack
- Iodine solution for testing for starch (photosynthesis)
- Simple potometer
- Digital balance
- Glass beakers
- Hand magnifiers
- Retort stands and clamps
- Glass rods
- Polyethene Wash bottles
- Beakers
- Petri dishes
- Filter papers

- Safety glasses
- Stainless steel spatulas
- Plastic test tube racks
- Wooden test tube holder
- Soda glass boiling tubes with rim
- Economy test tubes (16 x 100 mm)
- Gratnell trays
- Student Dissection Kit
- Borosilicate glass measuring cylinders
- Disposable Pasteur pipettes
- Glass funnels
- Conical flasks
- Test tubes brushes
- Hotplate
- Wire gauze
- Tripod
- Heat mat
- First Aid box
- Eye washing station
- Dicot flower model
- Fish model
- Chicken model
- Plant posters
- Handheld EC/TDS meter
- Handheld pH meter

**Root apical meristem*

- Shoot apical meristem
- Monocot root cross section
- Dicot root cross section
- Monocot stem showing vascular bundle
- Dicot stem showing vascular bundle
- Annual rings woody stem
- Dicot leaf cross section
- Lower epidermis (leaf) showing stomata
- Typical plant cell
- Sieve tube element phloem longitudinal section
- Cell division - mitosis
- Cell division - meiosis
- Parenchyma cells
- Collenchyma cells
- Sclerenchyma cells
- Xylem cells longitudinal section
- Root tip with hair roots
- Case to hold the slides

Other Requirements

- Fire alarm system
- Fire-fighting equipment
- Intruder alarm system
- Telephone and data network (internet access)
- Access to computer laboratories
- Digital cameras (video and photo) with tripod
- External hard drive
- External pen drive storage
- External DVD/CD writer

Appendix 2 – Portfolio Marking Schemes

PART 1 – BASED ON ANY TWO APPLICATION CRITERIA FROM UNIT 1				Criterion 1 Marks	Criterion 2 Marks	Total Marks
Overview of Application Process	1 – 3 marks	4 – 6 marks	7 – 10 marks	/10	/10	/20
	Steps required as part of the overall process to complete the whole criterion are provided – without any details or elaboration – but most are missing, incorrect, or not necessarily in logical order.	The main steps required as part of the overall process to complete the whole criterion are provided – including some detail or elaboration – but some are missing, incorrect, or not necessarily in logical order.	Most of, or all, the main steps required as part of the overall process to complete the whole criterion are correctly provided – including necessary details or elaboration – and in a logical order.			
Supporting Evidence	1 – 2 marks	3 – 4 marks	5 – 7 marks	/7	/7	/14
	The submitted photo evidence only shows the final work or artifact. Linking to supporting evidence does not exist or is inconsistent.	The submitted photo evidence shows some steps and the final work or artifact. Linking to supporting evidence is overall consistent.	The submitted photo evidence shows most of, or all, the main steps and the final work or artifact, using proper captions. Linking to supporting evidence is consistent throughout.			
Overview of Skills	1 – 3 marks	4 – 6 marks	7 – 10 marks	/10	/10	/20
	Underlying skills employed to complete the criterion are provided – without any details or elaboration – but most are missing or incorrect.	The main underlying skills employed to complete the criterion are provided – including some details or elaboration – but some are missing or incorrect.	Most of, or all, the main underlying skills employed to complete the criterion are correctly provided – including necessary details or elaboration.			
Presentation	1 mark	2 – 3 marks	4 – 6 marks			/6
	The material submitted for this part of the Portfolio generally follows the template, but the overall presentation is poor and/or inconsistent.	The material submitted for this part of the Portfolio follows the template, and the overall presentation is good and consistent.	The material submitted for this part of the Portfolio follows the template, and the presentation is excellent and consistent throughout. A proper Table of Contents is also included.			
TOTAL PART 1 MARK						/60

PART 2 – BASED ON ANY TWO APPLICATION CRITERIA FROM UNIT 2				Criterion 1 Marks	Criterion 2 Marks	Total Marks
Overview of Application Process	1 – 3 marks	4 – 6 marks	7 – 10 marks	/10	/10	/20
	Steps required as part of the overall process to complete the whole criterion are provided – without any details or elaboration – but most are missing, incorrect, or not necessarily in logical order.	The main steps required as part of the overall process to complete the whole criterion are provided – including some detail or elaboration – but some are missing, incorrect, or not necessarily in logical order.	Most of, or all, the main steps required as part of the overall process to complete the whole criterion are correctly provided – including necessary details or elaboration – and in a logical order.			
Supporting Evidence	1 – 2 marks	3 – 4 marks	5 – 7 marks	/7	/7	/14
	The submitted photo evidence only shows the final work or artifact. Linking to supporting evidence does not exist or is inconsistent.	The submitted photo evidence shows some steps and the final work or artifact. Linking to supporting evidence is overall consistent.	The submitted photo evidence shows most of, or all, the main steps and the final work or artifact, using proper captions. Linking to supporting evidence is consistent throughout.			
Overview of Skills	1 – 3 marks	4 – 6 marks	7 – 10 marks	/10	/10	/20
	Underlying skills employed to complete the criterion are provided – without any details or elaboration – but most are missing or incorrect.	The main underlying skills employed to complete the criterion are provided – including some details or elaboration – but some are missing or incorrect.	Most of, or all, the main underlying skills employed to complete the criterion are correctly provided – including necessary details or elaboration.			
Presentation	1 mark	2 – 3 marks	4 – 6 marks			/6
	The material submitted for this part of the Portfolio generally follows the template, but the overall presentation is poor and/or inconsistent.	The material submitted for this part of the Portfolio follows the template, and the overall presentation is good and consistent.	The material submitted for this part of the Portfolio follows the template, and the presentation is excellent and consistent throughout. A proper Table of Contents is also included.			
TOTAL PART 2 MARK						/60

PART 3 – BASED ON ONE UNIT 3 APPLICATION CRITERION AND SELF-EVALUATION				Total Marks
Overview of Application Process	1 – 3 marks	4 – 6 marks	7 – 10 marks	/10
	Steps required as part of the overall process to complete the whole criterion are provided – without any details or elaboration – but most are missing, incorrect, or not necessarily in logical order.	The main steps required as part of the overall process to complete the whole criterion are provided – including some detail or elaboration – but some are missing, incorrect, or not necessarily in logical order.	Most of, or all, the main steps required as part of the overall process to complete the whole criterion are correctly provided – including necessary details or elaboration – and in a logical order.	
Supporting Evidence	1 – 2 marks	3 – 4 marks	5 – 7 marks	/7
	The submitted photo evidence only shows the final work or artifact. Linking to supporting evidence does not exist or is inconsistent.	The submitted photo evidence shows some steps and the final work or artifact. Linking to supporting evidence is overall consistent.	The submitted photo evidence shows most of, or all, the main steps and the final work or artifact, using proper captions. Linking to supporting evidence is consistent throughout.	
Overview of Skills	1 – 3 marks	4 – 6 marks	7 – 10 marks	/10
	Underlying skills employed to complete the criterion are provided – without any details or elaboration – but most are missing or incorrect.	The main underlying skills employed to complete the criterion are provided – including some details or elaboration – but some are missing or incorrect.	Most of, or all, the main underlying skills employed to complete the criterion are correctly provided – including necessary details or elaboration.	
Self-Evaluation	1 – 8 marks	9 – 16 marks	17 – 27 marks	/27
	One soft and one technical skill gained throughout the subject are evaluated in relation to personal growth or future employment in industry. The arguments linking the skills gained with their contribution towards personal growth or future employment are generic or weak.	Various soft and technical skills gained throughout the subject are evaluated in relation to personal growth and future employment in industry. The arguments linking the skills gained with their contribution towards personal growth and future employment are valid, but some are not properly developed.	Various soft and technical skills gained throughout the subject are evaluated in relation to personal growth and future employment in industry. Most of, or all the arguments linking the skills gained with their contribution towards personal growth and future employment are properly developed.	
Presentation	1 mark	2 – 3 marks	4 – 6 marks	/6
	The material submitted for this part of the Portfolio generally follows the template, but the overall presentation is poor and/or inconsistent.	The material submitted for this part of the Portfolio follows the template, and the overall presentation is good and consistent.	The material submitted for this part of the Portfolio follows the template, and the presentation is excellent and consistent throughout. A proper Table of Contents is also included.	
TOTAL PART 3 MARK				/60