EXAMINATIONS COUNCIL OF ESWATINI

Agriculture

EGCSE

Eswatini General Certificate of Secondary Education



Syllabus

For Examination in 2027-2029

What has changed in the EGCSE Agriculture 6882 for 2027 to 2029

The **2027** to **2029** syllabus has been revised. There were changes which were made in the syllabus.

You are advised to read the whole syllabus before planning your teaching programme.

Changes made:

Content: **Page**

1. 4.1.1 Soil formation 14
- Describe the soil profile in terms of topsoil, subsoil, parent material and parent rock in relation to crop production

2. 4.3.1 Land preparation 16
- Discuss the drainage methods (open ditches, perforated pipes) used to prevent waterlogging in soils

3. 5.4 Describe production/rearing of two types of livestock (poultry and rabbits) with reference to: farming system (intensive, extensive and commercial) feeding, breeding practices (inbreeding, crossbreeding and outcrossing), care of the young, disease prevention and control, marketing (refer to section 2.2) *, selling of animal products* 19

4. Layout of the Investigatory Project Report 32

Introduction
This should include:
- Brief background about the research (with not more than three citations); 32

5. Summary, Conclusions and recommendations 32
- Problems encountered and possible solutions (4 problems).
- Evidence of work done

6. Assessment Criteria for Investigatory Practical Exercise

Presentation of Introduction

- Brief background about the research (with two citations) 33

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ESWATINI GENERAL CERTIFICATE OF SECONDARY EDUCATION

Broad Guidelines

The Ministry of Education is committed, in accordance with the National Policy Statement on Education, to provide a Curriculum and Assessment System (Form 4 and Form 5) so that at the completion of secondary education, learners will

- be equipped to meet the changing needs of the Nation and have attained internationally acceptable standards.

Eswatini's National Education Policy Directives

EGCSE syllabuses for studies in Form 4 and Form 5 will individually, and collectively, enable learners to develop essential skills and provide a broad learning experience which

- inculcates values and attitudes as well as knowledge and understanding,
- encourages respect for human rights and freedom of speech,
- respects the values and beliefs of others, relating to issues of gender, culture and religion,
- develops desirable attitudes and behaviour towards the environment,
- provides insight and understanding of global issues which affect quality of life in Eswatini and elsewhere, e.g., the AIDS pandemic; global warming; misdistribution of wealth; and technological advances.

The National Curriculum for Form 4 and Form 5

Learners will be given opportunities to develop essential skills which will overlap across the entire range of subjects studied. These skills are listed below.

- Communication and language skills
- Numeracy skills: mathematical ideas, techniques and applications
- Problem-solving skills
- Technological awareness and applications
- Critical thinking skills
- Work and study skills
- Independent learning
- Working with others

To develop these skills, learners must offer five compulsory subjects and at least three elective subjects chosen from one or more Field of Study.

Compulsory Subjects

- SiSwati – either First Language or Second Language
- English Language
- Mathematics
- Science
- Religious Education

Fields of Study

- Agriculture Field of Study
- Business Studies Field of Study
- Home Economics Field of Study
- Social Sciences and Humanities Field of Study
- Technical Field of Study

INTRODUCTION

The Eswatini General Certificate of Secondary Education (EGCSE) syllabuses are designed as two-year courses for examination in Form 5. Agriculture is an applied science. This being the case, it follows that for assessment to be consistent with teaching and learning situations, it should also be learner-centred and activity based.

Agriculture is a multidisciplinary subject that will, through the use of learner-centred teaching approaches, allow the learners to make use of the existing knowledge, and construct new ones so as to build understanding of crop and animal production, as well as processing and marketing of agricultural produce. This curriculum is designed to integrate cross-field, developmental objectives and content, thereby promoting entrepreneurial and management skills that will enhance the development of desirable attitudes and values.

Learners will apply scientific principles to farming and demonstrate their appreciation of the industry as profitable to the individual, community, Nation, the SADC (Southern African Development Community) Region and globally. They will also develop problem solving skills through awareness of existing national agricultural problems, relationships between humans, nature and the impacts of socio-cultural, socio-economic and political issues on natural resources and on sustainable agricultural production.

All EGCSE syllabuses follow a general pattern. The main sections are:

- Aims
- Assessment Objectives
- Assessment
- Curriculum Content

Agriculture is an Elective Subject and falls into the Agriculture Field of Study which includes: Biology, Combined Science/Physical Science and Geography.

AIMS

The aims of the syllabus are the same for all learners. These aims are set out below and describe the educational purposes of a course in Agriculture for the EGCSE Examination. They are not listed in order of priority.

The aims are to enable learners to:

1. demonstrate the value of agriculture to the family and community, and show how Agriculture can contribute to the world-wide campaign for poverty alleviation and food security;
2. develop scientific methods such as accuracy and precision, objectivity, integrity, enquiry and inventiveness;
3. develop initiative and self-education so as to encourage resourcefulness and self-reliance;
4. develop desirable values and attitudes towards the country's natural resources for sustainable agricultural development;
5. create awareness of existing problems so as to stimulate problem solving abilities;
6. promote gender equity in the learning activities, by recognising the realities of the roles played in agriculture;
7. stimulate development of entrepreneurial skills necessary to initiate and manage agri-business;
8. harness indigenous knowledge and experiences so as to promote socio-cultural diversity;
9. provide a background, together with basic sciences, mathematics and other relevant subjects for more advanced studies in agriculture;
10. promote awareness of the impact of HIV/AIDS on agricultural production;
11. ensure that the learning of agriculture integrates with development agencies;
12. encourage the development of an agriculture department farm or small holding ensuring that learners actively participate in farming events;
13. evaluate the ethical implications of intensive agricultural production and genetic engineering in Eswatini. Also to foster a balance among productivity, sustainability, and societal values with reference to high density livestock, overuse of inorganic fertilisers and pesticides; as well as large scale farming;
14. encourage pupils to appreciate and have interest in agriculture because of its contribution to food security and poverty alleviation.

PRIOR KNOWLEDGE

The programme is designed for students who have successfully completed Eswatini Junior Secondary Education or equivalent. Though preference is given to candidates who have done Junior Secondary Agriculture education but those who have not done it remain acceptable.

TEACHING HOURS

Appropriate teaching time for the Agriculture syllabus should be equivalent to six (6) periods of forty (40) minutes each over a period of sixty (60) weeks/cycles.

PROGRESSION

The EGCSE Agricultural qualification enables candidates to progress directly to further education, gainful employment and self-employment.

SUPPORT DOCUMENTS

A wide range of materials and resources are available to support teachers in Eswatini schools. The resources suit a variety of teaching methods in the local context. Through targeted training forums, teachers can access the expert advice they need for teaching this syllabus.

RECOMMENDED TEXTBOOKS

1. Macmillan Agriculture for Southern Africa
2. O Level Agriculture
3. East African Agriculture
4. Oxford IGCSE Modern Agriculture

EXAM PREPARATION RESOURCES

Examination report, syllabus, past papers and specimen papers are available on ECESWA website: www.examscouncil.org.sz

TRAINING

ECESWA offers training in assessment to ensure that teachers have the relevant knowledge and skills to conduct assessment of learning.

SPECIAL REQUIREMENT

A poultry house and a garden/field is essential for this programme.

ASSESSMENT OBJECTIVES

Assessment Objectives in Agriculture are:

A Knowledge with Understanding
B Handling Information and Solving Problems
C Practical Skills and Abilities

The assessment will include, wherever appropriate, personal, social, environmental, economic and technological applications of agriculture in modern society and contemporary issues (gender, HIV/AIDS and entrepreneurship).

A description of each assessment objective follows.

A KNOWLEDGE WITH UNDERSTANDING

Learners should be able to demonstrate knowledge and understanding in relation to the use of:
1. language (terms, symbols, quantities and units);
2. facts, concepts, principles, patterns, models and theories;
3. the techniques, procedures and principles of safe agricultural practice.

B HANDLING INFORMATION AND SOLVING PROBLEMS

Learners should be able, in words or using other written forms of presentation (i.e. symbolic, graphical and numerical), to:
4. locate, select, organise and present information from a variety of sources;
5. translate information from one form to another;
6. use information (data) to identify patterns, report trends and draw inferences;
7. present reasoned explanations for phenomena, patterns and relationships;
8. solve problems, including some of a quantitative and qualitative nature.

C PRACTICAL SKILLS AND ABILITIES

Learners should be able to:
9. develop, organise and use techniques, apparatus and materials;
10. make and record observations and measurements;
11. interpret and evaluate experimental observations and data;
12. make predictions and propose hypothesis and plan investigations.

Specification Grid

The approximate weightings allocated to each of the assessment objectives in the assessment model are summarised in the table below.

Assessment Objectives	Weighting
A Knowledge with understanding	30% (not more than 15% recall)
B Handling information and solving problems	40%
C Practical skills and abilities	30%

The assessment objectives are weighted to give an indication of their relative importance. The percentages are not intended to provide a precise statement of the number of marks allocated to particular assessment objectives.

ASSESSMENT

Scheme of Assessment

All papers are compulsory.Candidates must enter for Papers 1, 2,3 and 4 and are eligible for the award of Grades A* to G. A description of each paper follows.

Paper 1 (1 hour) consisting of 40 marks
Candidates will be required to answer forty compulsory multiple-choice questions worth 40 marks.
Questions will test skills mainly in Assessment Objective A.

This paper will be weighted at 30% of the final total available marks.

Paper 2 (2 hours) consisting of 100 marks
This paper will be divided into two sections A and B.

Section A (70 marks) Seven compulsory structured questions each having a common context.
Section B (30 marks) Candidates will be required to answer **two** essay questions (15 marks each) from a choice of three.
Questions will test skills mainly in Assessment Objectives A and B.

This paper will be weighted at 40% of the final total available marks.

Paper 3 Practical Exercises consisting of ***150 marks***

Candidates will be required to undertake three practica l exercises; each with a total of **50 Marks**. Paper 3 is divided into two sections:
Section A assesses practical skills under the 5 criteria (responsibility, initiative, technique, perseverance and quality) and should be done during the course of the practical***. (75 marks).***

Section B assesses processed skills (written work). ECESWA will schedule dates for assessing these skills. ***(75 marks).***

Schools should ensure appropriate facilities for the practical work. The practical exercises will be assessed by teachers. See 'Assessment Criteria for Practical Exercises under Appendix 1A: Practical Skills.

The purpose of this paper is to test appropriate skills in Assessment Objective C.

This paper will be weighted at 15% of the total available marks, which scales down to **30 Marks**.

Paper 4 Investigatory Project consisting of 30 marks
Candidates will be required to undertake one investigatory project (30 marks).
Schools should ensure appropriate and adequate facilities for practical work.
This work does not have to be limited to topics stated in the syllabus content.
The investigatory project will be assessed by teachers. See 'Assessment Criteria for investigatory project under Appendix 1B: Practical Skills.

This paper will be weighted at 15% of the total available marks.

Weighting of Papers

Paper	Marks	Weighting
1	**40**	30%
2	**100**	40%
3	**30**	15%
4	**30**	15%

CURRICULUM CONTENT

Learners will study all topics in the Curriculum Content outlined below. The content is divided into six (6) topics. The main topic areas are emboldened on the left-hand column, with concepts indicated below. The right-hand column provides details of the specific objectives.

Notes:

(i) The Curriculum Content is designed to provide guidance to teachers as to what will be assessed in the overall evaluation of the learner. It is not meant to limit, in any way, the teaching programme of any particular school.

(ii) An asterisk (*) denotes an area of the syllabus that could be used for the practical exercises.

(iii) It is intended that, in order to avoid difficulties arising out of the use of l as the symbol for litre, use of dm^3 in place of l or litre will be made.

(iv) The terms in brackets ( ) are examples that will specifically be tested in the exam questions.

Appropriate teaching time for the Agriculture syllabus should be equivalent to six (6) periods of forty (40) Minutes each over a period of sixty (60) weeks/cycles.

1. GENERAL AGRICULTURE	
1.1 Importance of Agriculture	All learners should be able to: • Explain the importance of agriculture in alleviating poverty and food insecurity • Describe the contribution of agriculture to the family, the national economy, and world trade • Discuss the role of youth and women in agriculture development
1.2 History of Agriculture	All learners should be able to: • Describe the origin of agriculture – gathering/hunting, domestication, shifting cultivation/ nomadic herding, settled agriculture (subsistence, cash-crop, commercial) • Describe the importance of research in agriculture development
1.3 Farming Systems	All learners should be able to: • Describe modern farming systems (intensive/ commercial, organic farming) • Discuss farming practices: mono-cropping/monoculture, Intercropping, mixed farming, crop rotation. • Discuss new trends in farming systems: hydroponics, permaculture and genetically modified organisms (GMO's) including GMO's seed importation • State and explain the land tenure systems: individual (freehold, leasehold, title deed) and communal (Swazi Nation Land)

1.4 Indigenous Knowledge Systems	All learners should be able to: • Discuss the importance of indigenous knowledge in agriculture • Explain the difference between indigenous breeds and exotic breeds in livestock
1.5 HIV/AIDS	All learners should be able to: • Explain the impact of HIV/AIDS on agricultural activities: labour, productivity and economy • Suggest the impact of HIV/AIDS to the family; child headed/old age; in relation to land, resources and productivity.
1.6 National and Regional Policies and Programmes	All learners should be able to: • Explain the value of national and regional agricultural policies: water act, crop and stock movement act, forest policy, environment act • Understand the role of the following programmes in agricultural development: extension, regional development fund and National Maize Cooperation (NMC) input subsidy
2. AGRICULTURE ECONOMICS	
2.1 Principles of Economics	All learners should be able to: • Define agriculture economics • Describe agricultural resources/factors of production (Land, Labour, Capital) • Explain: the law of diminishing returns, supply, law of supply, demand, law of demand, opportunity cost, risk and uncertainty
2.2 Marketing	All learners should be able to: • Explain market research and its importance • Describe the marketing functions; collection, (assembling, harvesting and slaughtering), transport, sorting, grading, processing, packaging, advertisement, storage, financing • Describe the standards for exporting baby vegetables
2.3 Farm Records	All learners should be able to: • Define the types of records: production, financial (refer to 4.3.2 and 5.4) * • Explain their use and importance
2.4 Farm Accounting	All learners should be able to: • Know how to prepare financial accounts relating to farming including costs and returns, profit and loss, and calculate gross margins (refer to 4.3.2 and 5.4) * • Define variable costs, fixed costs, total costs, total returns, depreciation, assets and liabilities

2.5 Budgeting	All learners should be able to: • Define budgeting • State sources of information for budgeting • Explain the purpose of a farm budget
2.6 Farm Credit	All learners should be able to: • State sources of farm credit • Describe the types of credit; short, medium, and long-term loan • Describe the importance of farm credit • Identify the requirements for accessing a loan from credible financial institutions
2.7 Entrepreneurship / Agribusiness	All learners should be able to: • Define agribusiness • Define entrepreneurship • Discuss the importance of entrepreneurship • Define productivity • Discuss factors affecting farm productivity (management, environmental, technological)
3. ENVIRONMENTAL ISSUES	
3.1 Environmental Influences	All learners should be able to: • Explain how temperature, wind, humidity, rainfall, photoperiod (light duration), affect the growth of plants and animals
3.2 Greenhouse Effect/ Global Warming/ Climate Change	All learners should be able to: • Define the greenhouse effect; global warming; climate change • Outline the causes of greenhouse effect; global warming; climate change • Explain the impact of greenhouse effect; global warming; climate change on agricultural activities and productivity • Outline agricultural adaptation measures to overcome climate change (greenhouses, drought tolerant crops, conservation agriculture, organic farming) (refer to section 3.5)
3.3 Desertification	All learners should be able to: • Define desertification • Describe the factors that lead to desertification • Understand the impact of desertification on agriculture

3.4 Pollution	All learners should be able to: • Describe water (eutrophication), air (acid rain) and soil (residual chemical effect) pollution • Discuss ways of preventing/reducing pollution (including recycling) • Describe the safe use and necessary precautions taken when handling farm chemicals to minimize pollution and poisoning • Explain the farm chemical waste disposal regulations (refer to Eswatini Environmental Authority EEA act)
3.5 Sustainable Agriculture	All learners should be able to: • Define sustainable agriculture • Describe the relevance of sustainable Agriculture to: sustainable increase in productivity, climate change mitigation, climate change adaptation • Describe the following sustainable Agriculture practices: - Conservation Agriculture [minimum tillage, permanent soil cover/mulching, crop associations (crop rotation, mixed cropping, intercropping, relay cropping)] - Agroforestry - Bio intensive integrated pest management
4. CROP HUSBANDRY	
4.1 Soils	All learners should be able to:
4.1.1 Soil formation	• Describe the process of soil formation with reference to physical (exfoliation, freeze-thaw, pressure release), chemical (carbonation, hydrolysis, oxidation) and biological weathering (plants and animals) • Describe the soil profile in terms of topsoil, subsoil, parent material and parent rock in relation to crop production
4.1.2 Soil composition/ constituents	• Discuss the soil constituents: mineral particles, organic matter, air, living organisms and water*
4.1.3 Soil structure	• Distinguish between crumb, platy and prismatic soil structure • Describe how to create/maintain a good crumb structure
4.1.4 Soil texture/ types	• Identify the different sizes of soil particles in terms of sand, silt and clay* • Describe the main characteristics of clay soils, sandy soils, silt and loam soils in terms of particle size, pore space, water retention, temperature, cultivation and plant growth*

4.1.5 Soil fertility	• List the major and minor plant nutrients • Describe the effects of major (N, P, K) plant nutrients to the growth and development of a plant • State sources of nutrients: organic (farmyard manure, compost and green manure) and inorganic (compound and simple) fertilisers • Discuss advantages and disadvantages of organic and inorganic fertilisers • Explain how leaching and runoff reduce soil fertility • Draw and describe the nitrogen cycle making reference to specific named micro-organisms (rhizobium, azotobacter, nitrobacter, nitrosomonas, denitrifying bacteria).
4.1.6 Soil pH	• Define pH and the pH scale, stating factors influencing soil pH • Explain the effects of pH on plant growth • Describe the soil sampling procedure and methods* • Describe how to carry out a soil test for nutrients (nitrates, potash and phosphates) • Describe how to carry out soil test for pH using the Barium Sulphate method and pH meter* • Describe how soil pH can be regulated* (the use of lime for acid soils and sulphate fertilisers on alkaline soils)
4.1.7 Soil erosion and conservation	• Describe the types of erosion: Water (gully, sheet, rill, splash) and Wind (surface creep, saltation and suspension) in relation to monoculture • Explain the effects of soil erosion on agricultural production • Describe methods used to reduce soil erosion*(terracing, contour ploughing, tie-ridging, planting trees, gabions) *
4.2 Principles of Plant	All learners should be able to:
4.2.1 Germination	• Define germination • State conditions for germination* • Describe the seed structure and germination of: - maize (hypogeal); - French bean (epigeal)*
4.2.2 Absorption of plant requirements	• Describe the structure of a root as seen in a transverse section • Describe the function of root hair, xylem and phloem in the uptake of water and minerals • Describe osmosis, diffusion, and active transport and explain how they are involved in the absorption of water and minerals*

4.2.3 Plant processes	• Describe the functions of the internal parts of a leaf • Describe photosynthesis in terms of carbon dioxide, water, light, chlorophyll and the production of carbohydrates and oxygen • Explain the factors affecting photosynthesis rate • Describe transpiration and its importance in terms of the transpiration stream, diffusion and evaporation in plants • Describe respiration as the release of energy from food substances in living cells with the release of carbon dioxide • Describe translocation and its importance in terms of food storage organs and types of food stored
4.2.4 Reproduction in plants	• Define sexual and asexual reproduction • Explain the importance of sexual and asexual reproduction • Describe the functions of various parts of a bean and a maize flower in relation to sexual reproduction • Define pollination, with reference to the different types; cross pollination, self- pollination • Describe the mechanism of pollination in maize (wind pollinated) and bean (insect pollinated) • Discuss artificial pollination in plants • Describe how selective breeding can improve the yield/ production, disease resistance, hardiness and appearance in plants • Define fertilisation • Describe the process of fertilisation in beans and maize • Describe the production of sweet potato using stem cuttings as an example of asexual reproduction/ vegetative propagation*
4.3 Crop Production	All learners should be able to:
4.3.1 Land preparation	• Describe land preparation: clearing (burning, cutting, stumping), ploughing, soil amendment, suitable tilth* • Discuss the drainage methods (open ditches, perforated pipes) used to prevent waterlogging in soils

4.3.2 Production of main crops	• Describe and carryout the cultivation of **two** vegetable crops (Group 1) and the **two** field crops (Group 2) in relation to: * - choice of suitable cultivars, - soil and climatic requirements, - soil preparation, - sowing or planting time and method, - type of fertilizer/manure, rate of fertilizer, method of application, - seed type,seed rate and spacing, - prevention and control of common pests, diseases and weeds, - recognising crop maturity, harvesting, storage, marketing, uses of by- products, - keeping relevant records (diary, production, financial).

2027	**2028**	**2029**
Group 1/ Vegetables: lettuce (leaf) tomato (fruit)	**Group 1/ Vegetables:** cabbage (leaf) beetroot (root)	**Group 1/ Vegetables**: spinach (leaf) tomato (fruit)
Group 2/ Field crops: maize (cereal), sweet potato (root)	**Group 2/ Field crops**: maize (cereal), sweet potato (root)	**Group 2/ Field crops**: maize (cereal), sweet potato (root)
4.4 Crop Protection	All learners should be able to:	
4.4.1 Weed control	• Identify common weeds and their morphology* • Describe the harmful effects and mode of spread of these named weeds: pig weed and star grass • Define invasive plant species • Identify the common invasive species in the Kingdom of Eswatini* *(Triffid/Paraffin weed-Chromolaena odorata; lantana camara; Bugweed/ wild tobacco tree- Solanum mauritianum; Mauritius thorn-Caesalpinia decapetala)* • Explain the effects (economic, production, environmental) of invasive species • Explain the common methods of weed control (including invasive plants): cultural, mechanical, biological and chemical • Distinguish between selective/non-selective and pre-emergence/ post emergence herbicides. *	
4.4.2 Pest control	• Describe the mode of attack of the pest(s) from each of the following pest types and nature of the damage caused biting and chewing (locust and armyworm), piercing and sucking (aphids. leafhoppers), boring (American bollworm and stalk borer larva). • Describe the following methods of pest control: chemical including systemic, biological and cultural in reference to the above pest types	
4.4.3 Disease Control	• Describe the mode of infection, harmful effects, prevention and control of one plant disease from each of the following: bacterial (bacterial wilt of tomatoes), fungal (blight of potatoes and damping-off), viral (maize streak virus).	
5. LIVESTOCK HUSBANDRY		
5.1 Types of Livestock	All learners should be able to: • List the different types of livestock Ruminants – cattle and goats Non-ruminants – pigs and rabbits Poultry - chickens and turkey Fish – tilapia and carp	

5.2 Anatomy and Physiology	All learners should be able to: • Describe the structure of the digestive system of a ruminant and a rabbit* • Describe the process of digestion in ruminants and rabbits including the action of micro-organisms, enzymes and end products • Describe the structure of a male and female reproductive system in a ruminant • Describe the role of testosterone in male animals • State the signs of heat and its relevance for breeding (oestrus cycle) • Describe the roles of oestrogen and progesterone • Describe the process of mating, fertilisation, gestation and birth in cattle, and relevant hormones including relaxin. • Discuss artificial insemination (AI) • Discuss importance of colostrum, lactation and weaning in cattle
5.3 Livestock Nutrition	All learners should be able to: • Explain the nutritional requirements suitable for livestock of different ages (refer to broiler, cattle) * • Discuss the types of feeds (roughages, concentrates) in terms of water content, nutritional value and suitability to the type of livestock • Discuss the importance of extra feed (supplements) in livestock production in relation to protein, energy and mineral needs • Discuss common feeding practices (restricted and adlib) in relation to poultry and cattle • Discuss the importance of: a balanced, maintenance and production rations • Discuss the importance of adequate water supplies
5.4 Livestock Management	All learners should be able to: • Describe production/rearing of two types of livestock (poultry and rabbits) with reference to: farming system (intensive, extensive and commercial) feeding, breeding practices (inbreeding, crossbreeding and outcrossing), care of the young, disease prevention and control, marketing (refer to section 2.2) *, selling of animal products* • Describe how selective breeding can improve the yield/ production, disease resistance, hardiness and appearance in animals • Keep relevant records (refer to section 2.3) * • Discuss the management practices: (refer to cattle) deworming, vaccination, identification, castration and dehorning

5.5 Pasture Management	All learners should be able to: • Explain extensive pasture management practices/ communal grazing (SNL) in relation to: fencing, stocking rate, overgrazing/undergrazing, breeding, diseases and parasites, condition of livestock • Explain the establishment of improved/ cultivated pastures (Rye grass and Kikuyu) and pasture legumes (Lucerne and Leucaena) • Explain the utilization of pastures including grazing control (paddocks, strip grazing, rotational grazing and zero grazing/feedlots) • Describe the pasture management practices: fertilizing, veld reinforcement, weeding, bush control and burning • Describe the processing, conservation and utilization of fodder (hay and silage) • Explain and demonstrate the concept of stocking rate and carrying capacity using examples*
5.6 Health and Diseases	All learners should be able to: • Describe the general characteristics of healthy and unhealthy livestock • Describe the mode of infection, harmful effects, prevention and control of the animal diseases from these classifications: bacterial (Brucellosis), viral (Newcastle disease), tick-borne diseases (Redwater) and protozoan (Coccidiosis) • Outline the effects of internal and external parasites in livestock. • Explain the control of internal parasites (Tapeworm) • Demonstrate calibration, dilution and deworming using the dosing gun* • Explain the control of external parasites (Ticks) in relation to spraying, dipping and pour on's using acaricides (Drastic deadline). • Explain what is meant by an infectious notifiable disease • State the legislative control measures used to prevent spread of livestock diseases (refer to 1.6) • Discuss nutritional deficiencies (calcium, phosphorus, iron, vitamin A and D)

6. AGRICULTURE ENGINEERING	
6.1 Farm Implements and Tools	All learners should be able to: • Identify the use, care and maintenance of the following tools used on a farm (saw, hammer, screwdriver, spanner, fork, spade, hoe) * • Demonstrate calibration, dilution and spraying using a knapsack sprayer* • Explain safety precautions in the use of farm tools, implements and machinery
6.2 Farm Mechanisation	All learners should be able to:
6.2.1 Intermediate Technology used in the farm	• Describe what is meant by intermediate technology • Explain the structure and mode of operation of two mechanical devices (wheelbarrow, trailer) *
6.3 Farm Structures	All learners should be able to:
6.3.1 Buildings	• Identify factors considered when selecting suitable sites for farm buildings • Describe materials locally available for building farm buildings, their properties and uses: wood, concrete blocks, metal, stone, brick, earth, thatch
6.3.2 Fencing	• Describe the materials available for fencing, their advantages and disadvantages (concrete, wood and metal) • Describe the types of fence suitable for different purposes • Describe the construction and maintenance of a fence* • Explain how fence posts may be preserved (wood-creosote, metal- paint) • Describe the fitting of a farm gate

6.4 Farm Water Supply	All learners should be able to:
6.4.1 Sources of water	• State sources of water and its use in livestock and crop production; including ground and surface water sources • Discuss the water cycle (use a diagram)
6.4.2 Irrigation systems	• Describe the different types of irrigation systems (surface irrigation, overhead irrigation, subsurface irrigation/drip irrigation) • Describe technological advances applied in drip and sprinkler irrigation (censors, timing, location and direction) • Describe the effects of irrigation on crop yield
6.4.3 Storage and conservation	• Discuss the methods of collecting water (roofs and catchment areas) and storage (dams, tanks) • Describe the construction of an earth dam • Explain the common methods of conserving water: drip irrigation, minimum tillage, mulching

GRADE DESCRIPTIONS

The scheme of assessment is intended to encourage positive achievement by all candidates. Grade descriptions are provided to give a general indication of the standards of achievement likely to have been shown by candidates awarded particular grades. The grade awarded will depend on the extent to which the candidate has met the assessment objectives overall and may conceal weakness in one aspect of the examination that is balanced by above-average performance on some other.

Criteria for the standard of achievement likely to have been shown by candidates awarded Grades A*, A, B, C, D, E, F and G are shown below:

A Grade A* candidate should be able to;

- articulate facts to principles and theories with precision,
- clearly explains why a technique was used for a procedure or operation,
- analyse information gathered from a number of sources and clearly present data,
- solve all problems presented, analysing all variables presented,
- process and interpret data from a number of sources to identify any patterns or trends,
- generate a hypothesis and critique facts surrounding the hypothesis.

A Grade A candidate should be able to;

- explain facts to principles and theories and vice versa,
- describe why particular techniques are preferred for a procedure or operation,
- select and describe information gathered from a number of sources and present it in a clear logical format,
- solve problems in varied situations that may involve a wide range of variables,
- process data from a number of sources to identify any patterns or trends,
- generate a hypothesis to explain facts or find facts to support a hypothesis.

A Grade B candidate should be able to;

- relate facts to principles and theories and vice versa,
- state why particular techniques are preferred for a procedure or operation,
- select and collate information from a number of sources and present it in a clear, logical format,
- solve problems in given situations but with a range of variables,
- process data from a limited number of sources to identify any patterns or trends,
- generate a hypothesis to explain some facts or find facts to support a hypothesis.

A Grade C candidate should be able to;

- link facts to situations not specified in the syllabus,
- describe the correct procedure(s) for a multi-stage operation,
- select a range of information from a given source and present it in a clear logical form,
- identify patterns or trends in given information,
- solve a problem involving more than one step, but with a limited range of variables,
- generate a hypothesis to explain a given set of facts or data.

A Grade D candidate should be able to;

- understand facts contained in the syllabus,
- indicate the correct procedure for a single or more operations,
- select and present more than one piece of information from given sources,
- solve a problem involving more than one step, but with a limited range of variables,
- identify patterns or trends from data,

- develop a hypothesis to explain a given set of facts or data.

A Grade E candidate should be able to;

- recall facts contained in the syllabus,
- identify the correct procedure for a single or more operations,
- select more than one piece of information from given sources,
- solve a problem involving more than one step,
- recognise which of two given hypotheses explains a set of facts or data,
- identify patterns or trends from data provided.

A Grade F candidate should be able to;

- recall simple facts contained in the syllabus,
- identify the correct procedure for a single operation,
- select a single piece of information from given sources,
- solve a problem involving one step if structured help is given,
- identify patterns or trends from simple data provided,
- recognise which of two given hypotheses
- explains a given set of facts or data.

A Grade G candidate should be able to;

- recall simple facts as given in the syllabus,
- relate given facts from two given sets of information,
- understand basic farming skills and procedures,
- solve a problem involving one step if structured help is given,
- explains a set of facts or data from a given sets of hypotheses,
- identify a pattern or trend that requires no manipulation or explanation.

APPENDIX 1A: PRACTICAL SKILLS

The total marks available for the assessment of practical skills during the course are **180 marks**; with Paper 3 totaling **150 marks** and Paper 4 totaling **30 marks**.

PAPER 3: PRACTICAL EXERCISES

Introduction

Paper 3 – Practical Exercises – consists of **three** distinct practical tasks, each carrying a total of **50 marks**. The teacher assesses the practical skills component using the Assessment Criteria outlined on page 26 of the syllabus. In addition, each exercise includes a written paper worth **25 marks**, developed by ECESWA to evaluate processed skills, and also marked by the teacher. Each practical exercise is divided into two sections:

- Section A: Practical Skills **(25 marks)**
- Section B: Processed Skills **(25 marks)**

All centres are required to submit all three completed practical exercises.

Aims

The teacher's assessment of practical exercises should aim at evaluation of skills and abilities essential to the study of Agriculture that are not suitably measured by theory examinations. These fall mainly into Assessment Objective C.

Assessment Criteria for Practical Exercises

Each practical exercise should be assessed according to the criteria stated below. Each criterion should be assessed and marked out of a maximum mark of 5. Ideally ECESWA will prepare these exercises on the different sections of the syllabus.

Responsibility [the ability to assume responsibility for the task in hand, and work from given instructions without detailed supervision and help]

Marking Guide	Marks
Follows written or verbal instructions without the need for help Carries out appropriate safety procedures Assumes responsibility easily and leads in group work	5 4
Follows written or verbal instructions with a little help Is aware of the need for safety procedures but has difficulty recognising them without guidance Shows responsibility for the work	3 2
Follows written or verbal instructions with considerable help. Shows little regard for safety procedures, even when told. Shows responsibility for the work	1 0

Initiative [the ability to cope with problems arising in connection with the task to see what needs to be done and to take effective action]

Marking Guide	Marks
Offers solutions or explanations to unexpected problems Recognises, and is able to anticipate, problems Solves problems without help Comments on imperfections of experimental methods or results	5 4
Offers solutions or explanations to unexpected problems after seeking advice Solves problems with help Recognises faults in experimental methods, given some pointers	3 2
Is uncertain how to proceed and requires considerable help Recognises only the most obvious errors in experimental methods after considerable guidance	1 0

Technique [the ability to tackle a practical task in a methodical, systematic way and to handle Tools skillfully and to good effect]

Marking Guide	Marks
Approaches tasks methodically and systematically. Handles tools/apparatus skillfully and confidently. Carries out practical procedures skillfully.	5 4
Handles tools/apparatus effectively. Carries out practical procedures adequately.	3 2
Handles tools/apparatus inappropriately. Carries out practical procedures with difficulty.	1 0

Perseverance [the ability to see a task through to a successful conclusion with determination and sustained effort]

Marking Guide	Marks
Completes all the required practical tasks and attendant written work Has a positive attitude and is well motivated? Carries out repetitive procedures willingly	5 4
Completes the required practical tasks and attendant written work with a little encouragement Carries out repetitive procedures willingly	3 2
Does not complete the required practical tasks and attendant written work Is somewhat disinterested/impatient when carrying out work and is disinclined to repeat procedures	1 0

Quality [the ability to attend to detail, so that the work is well finished and is well presented]

Marking Guide	**Marks**
Performs practical work thoroughly, pays attention to detail and produces a very Good final result Produces accurate, clear and neatly presented written work	5 4
Performs practical work thoroughly for the most part and produces a satisfactory to good final result Produces mostly accurate and clearly presented written work	3 2
Performs practical work in a rushed and superficial way and shows little concern for the finished product Produces inaccurate and poorly presented written work	1 0

NOTE: Detailed descriptors will be provided by ECESWA for each practical exercise.

APPENDIX 1B: PRACTICAL SKILLS

Paper 4 Investigatory Project

Introduction

Paper 4 is a teacher- assessed continuous assessment of the candidate's practical work. The teacher, who is responsible for allocating marks, is required to submit the complete schedule of all marks for the purpose of moderation. The total marks available for the assessment of the paper 4 investigatory project during the course are 30 marks and there is one investigatory project.

Aim

The teacher's assessment of investigatory project should aim at evaluation of skills and abilities essential to the study of Agriculture that are not suitably measured by theory examination. These fall mainly into Assessment Objective C.

Paper 4 Investigatory Project

This is a long-term investigatory project involving an investigation which should address the parts of Assessment Objective C where candidates produce a hypothesis, plan and carry out an investigation. The data collected is recorded, analysed, and conclusions made. A written report is required and the limitations of the investigation noted. This is assessed according to the criteria stated below. One investigatory project must be assessed during the course.

Investigatory Practical Exercise

Candidates will carry out and write a report, not exceeding 2000 words, on one investigatory project. The Teacher should evaluate and mark the investigatory project and award an overall mark out of 30.

The main aim of the investigatory project is that it should be done by the individual candidate, in connection with some particular study problem. Agriculture offers a wide scope for such exercises, and it should not be difficult to find suitable topics, bearing in mind the following principles:

- The work must be investigatory. The candidate must find the information for himself/herself by direct observation and measurement.
- Though the programme of study must be carried out by the candidate, it is the responsibility of the teacher to guide the student or even to select problems that suit the candidate's investigatory abilities. The teacher may also suggest methods of investigation that are likely to be effective. **Candidates are not research workers, but they can learn how to carry out investigations for themselves. Therefore, teachers are expected to give appropriate guidance throughout the investigatory project work.**
- The nature of the problem to be investigated should be stated and discussed by the candidate in the introduction.
- Candidates should be discouraged from spending so much time on their investigatory practical exercise that their normal class work suffers.
- It is not expected that candidates will necessarily solve all the problems they tackle, but they should make a worthwhile attempt to do so. When problems fail to yield positive results, the candidate should be encouraged to discuss their actual findings and comment on the implications.

Good investigatory practical exercise by candidates often leads them to understand the difficulties and subtleties of the problem and this can be very educational. For some candidates, negative results can be depressing, and teachers must use their judgment when guiding

them, so that they do not become discouraged.

The degree of guidance given calls for skill on the part of the teacher. Ideally, the candidate should be free to choose a topic for the project and to decide on methods used in the investigation. In practice, the candidate will need help because of inexperience. The teacher should never leave the candidate in doubt for long about what to do next, so that the candidate does not lose interest or enthusiasm for the practical exercise.

Investigatory practical exercise can be based on a variety of topics. The following examples are intended as a guide, but teachers may wish to help their candidates to devise investigatory practical exercise of their own along similar lines:

Field Experiments

- comparison of sowing depths, to discover effects (minimum, optimum and maximum depths)
- thinning of root crops; no thinning, thinning to various spacings, Effects upon total yield and size of roots produced
- plant population in relation to yield, spacing of plant stations and rows, comparison to find optimum spacings
- spraying versus not spraying: effects on infestation with disease or pest organisms, effects on yield, cost-effectiveness
- top-dressing versus not top-dressing: various treatments and effects, comparison of costs and yields
- fertiliser trials, organic versus inorganic, effects of differing application rates upon yields, diminishing returns
- rationing of livestock feed versus ad-lib feeding; effects on production, cost-effectiveness
- effects of different levels of nutrition on young stock (e.g., broiler chickens): measurement of live weight gain under different rationing regimes, effects on health, cost-effectiveness

In the case of field trials, it is often useful to have a group of candidates involved, in order to make possible replication of treatments on plots in different parts of the garden or field. This improves the statistical accuracy of the trial. However, each candidate's contribution must be assessed and individual reports must be written.

When different treatments are tried, the effect upon yield of produce is often a factor to be measured. The cost-effectiveness of alternative treatments should also be worked out, to see which one is the most profitable.

Attention should be paid to the presentation of results in a clear and concise form, i.e., Tabulation or graphical representation.

Reasons should always be given for treatments carried out, methods tried, or conclusions reached.

Field Surveys

- cattle tick survey: incidence of ticks on cattle (counts done on selected cows on their regular visits to the dip)
- marketing survey: goods produced by local farmers for sale, were sold, profitability, etc.
- farmers' knowledge of maize pests during storage (e.g., a case study of a community)

In field surveys, the aim is to carry out an information-gathering exercise and to evaluate the findings. Technology of survey employed should be stated (exhaustive, random sampling, etc.) and the results and the conclusions should be well summarised.

An example of how the practical exercises may be integrated within the practical investigation:

A candidate has decided to carry out an investigation on the effect of nitrate fertiliser on the yield of cabbages. Having proposed a hypothesis with the scientific reasons behind it and planned a suitable investigation the practical work is carried out. The first practical assessment could involve the preparation of the soil seed bed. The second assessment could involve the planting and spacing of cabbages and the application of nitrate fertiliser. The third assessment could involve harvesting and measuring the cabbage yield. The recording of the data, subsequent analysis and limitations are then written up as part of the practical investigation.

Layout of the Investigatory Project Report

Preliminary Information

- The report should **NOT** exceed 2000 words.
- Hand written and typed reports will be accepted.
- Typed reports should be written at line spacing 1.5, font size 12, Times New Roman.
- Reports should be presented in paper folders tied with strings; there is no need for binding.
- All investigatory projects should be accompanied by a diary.

Title

The report should bear a clear title, showing both the dependent and independent variables. This should appear on the cover page, together with the name of the candidate, candidate number and the name of the school.

Contents

A list of contents or topics should be included, showing clearly the main sections of the report and the page numbers where they appear. Lists of tables/ graphs and diary must be included. Pictures may also be included, if appropriate.

Introduction

This should include:

- Brief background about the search (with not more than three citations);
- Statement of the objective(s) /research questions of the project;
- Statement of the null and alternative hypothesis;
- Statement of the problem;
- Importance of the study

Literature Review

A brief literature review with four citations relevant to the topic, not exceeding a page.

Methodology

- Research design, specifying the type of study whether experimental or survey
- Plan of work; being the brief description of how the study will be carried out e.g. plot layout, plot size, plant spacing.
- Population and sampling
- Data collection
- Data analysis (statistics to be used e.g. means, percentages)

Results and discussion

Data collected should be presented in this section in the form of tables, charts, graphs or histograms. They must always be labelled with a brief description of the data. Reference should be made to citations made in literature review/background information.

Summary, Conclusions and Recommendations

- Summary of major findings
- Make conclusions (adopt hypothesis; relate to each specific objective)
- Problems encountered and possible solutions (4 problems).
- Make recommendations (to farmers and for further study)

Bibliography/ References cited

Assessment Criteria for Investigatory Practical Exercise

The paper 4 investigatory practical project should be assessed according to the criteria format stated below. Each criterion should be assessed and marked out of a maximum mark of 5. The maximum mark is 30.

Topic, table of contents, bibliography

Marking Guide	Marks
• Clear title, showing both the dependent and independent variables • Well-presented table of contents • A list of contents or topics included, showing clearly the main sections of the report • Page numbers clearly indicated. • Lists of tables, graphs and pictures can also be included, if appropriate • All references properly cited	5
• Clear title, showing both the dependent and independent variables • Well-presented table of contents • A list of contents or topics included, showing clearly the main sections of the report • Page numbers clearly indicated. • Lists of tables, graphs and pictures can also be included, if appropriate • Majority of the references properly cited	4
• Clear title, showing both the dependent and independent variables • Table of contents not complete • List of contents or topics show clearly some main sections of the report • Page numbers clearly indicated. • Some tables, graphs and pictures included. • Some references properly cited	3
• Title, showing only one variable • More information missing in the table of contents • Page numbers not complete. • Some tables, graphs and pictures included. • Fewer references properly cited	2
• Title, showing only one variable • No list of contents or topics included • No page numbers • Fewer lists of tables, graphs and pictures included • No references	1

• Title not clear • No table of content • No page numbers • Lists of tables, graphs and pictures not included • No references	0

Presentation of Introduction

Marking Guide	Marks
• Brief background about the research (with two citations) • Four well stated objective(s) /research questions of the project • Well stated statement of the problem • Importance of the study	5
• Brief background about the research (with one citation) • Four well stated objective(s) /research questions of the project • Well stated statement of the problem • Importance of the study	4
• Brief background about the research (with no citations) • Three well stated objective(s) /research questions of the project • Well stated statement of the problem • Importance of the study	3
• Brief background about the research (with no citations) • Two well stated objective(s) /research questions of the project • Statement of the problem not clearly stated • Importance of the study	2
• Brief background about the research (with no citations) • One well stated objective /research question of the project • Statement of the problem not clearly stated • Importance of the study	1

• No background information • Irrelevant objectives /research questions of the project • Statement of the problem not clear	0

Literature Review

Marking Guide	**Marks**
• A detailed literature review with four citations, not exceeding a page • Literature cited relevant to the topic	5
• A detailed literature review with three citations, not exceeding a page • Literature cited relevant to the topic	4
• A brief literature review with two citations • Literature cited relevant to the topic	3
• A brief literature review with one citation • Literature cited relevant to the topic	2
• A brief literature review with one citation • Literature cited has little relevancy to the topic	1
• No literature review • Literature cited not relevant to the topic	0

Methodology

Marking Guide	Marks
• Well stated research design, specifying the type of study whether experimental or survey • Plan; being the brief description of carrying out the study (procedure well outlined with dates of activity, tools and equipment used) • Population and sampling method specified • Data collection well described per objective • Data analysis clearly stated (statistics to be used e.g. means, percentages) per objective	5
• Well stated research design, specifying the type of study whether experimental or survey • Plan; being the brief description of carrying out the study (procedure well outlined with dates of activity, tools and equipment used) • Omits population or sampling method • Data collection well described per objective • Data analysis clearly stated (statistics to be used e.g. means, percentages)	4
• Well stated research design, specifying the type of study experimental or survey • Plan; being the brief description of carrying out the study (procedure well outlined with dates of activity, some tools and equipment used mentioned) • Omits population or sampling method • Data collection not described for some objectives • Data analysis clearly stated (statistics to be used e.g. means, percentages)	3
• Well stated research design, type of study not specified • Plan; being the brief description of carrying out the study (procedure well outlined for some activities) • Omits population and sampling method • Data collection described for a few objectives • Data analysis stated for few objectives (statistics to be used e.g. means, percentages)	2
• Research design not clear, • Plan; being the brief description of carrying out the study (procedure outlined very briefly) • Omits population and sampling method • Some data collection procedure described • Some data analysis indicated with statistical method (e.g. means)	1

• Research design not indicated • Plan not in a chronological order • Population and sampling not indicated • Data collection procedure not up to standard • Data analysis (incorrect statistics used)	0

Results and Discussion

Marking Guide	Marks
• Results presented neatly and clearly in a table and charts/ graphs/ histograms • Tables, charts, graphs and histograms used and well labelled • Included a brief description of the data in tables, charts, graphs and histograms used • Reference is made to citations made in literature review/ background information in discussion • Gives scientific explanation for obtained results	5
• Results presented neatly and clearly in a table and charts/ graphs/ histograms • Some tables, charts, graphs and histograms used well labelled • Included a brief description of the data in tables, charts, graphs and histograms used • Reference is made to citations made in literature review/ background information in discussion • Gives scientific explanation for obtained results	4
• Results presented neatly and clearly in a table, appropriate method of analysis chosen, graphs and/or histograms accurate and inaccurate presented • Data collected presented in this section in the form of tables, charts, graphs or histograms with a brief description. • Brief description of the data. • Data not related to citations made in literature review/ background information.	3
• Results presented in a table, inappropriate method of analysis chosen, graphs and/or histograms inaccurate and poorly presented • Data collected presented in this section in the form of tables, charts, graphs or histograms with no description. • Brief description of the data. • Data not related to citations made in literature review/ background information.	2

• Results not presented in a table, inappropriate method of analysis chosen, graphs and/or histograms inaccurate and poorly presented • Data collected not presented in this section in the form of tables, charts, graphs or histograms. • Brief description of the data. • Data not related to citations made in literature review/ background information.	1
• Results not presented in a table, inappropriate method of analysis chosen, graphs and/or histograms inaccurate and poorly presented • No data collection and presentation • No description of the data • No referencing and citations made in literature review/ background information	0

Summary, Conclusions and Recommendations

Marking Guide	**Marks**
• Summary of major findings • Conclusions given with reasons (adopt hypothesis; relate to each specific objective) • Comprehensive deductions based on the evidence • Problems encountered and solutions provided • Make recommendations (to farmers and for further study)	5
• Summary of major findings • Conclusions given with reasons (adopt hypothesis; relate to each specific objective) • Several deductions based on the evidence • Problems encountered and some solutions provided • Make recommendations (to farmers and for further study)	4
• Summary of major findings • Conclusions given with reasons (adopt hypothesis; relate to each specific objective) • Few deductions based on the evidence • Problems encountered and solutions not provided • No recommendations (to farmers and for further study)	3

• Summary of major findings • Conclusions given with no reasons (adopt hypothesis; relate to each specific objective) • Few deductions based on the evidence • Problems encountered and solutions not indicated • No recommendations (to farmers and for further study)	2
• Summary of some findings • No conclusions (adopt hypothesis; relate to each specific objective) • One deduction • Problems encountered and solutions not indicated • No recommendations (to farmers and for further study)	1
• No summary of major findings • No conclusions (adopt hypothesis; relate to each specific objective) • Inaccurate observations, deductions and records • Problems encountered and solutions not indicated • No recommendations (to farmers and for further study)	0

Moderation (Paper 3 and Paper 4)

- When several teachers in a Centre are involved in internal assessments, arrangements must be made within the Centre for all candidates to be assessed to common standard.
- It is essential that, within each Centre, the marks for each skill assigned within different teaching groups (e.g., different classes) are moderated internally for the whole Centre entry.
- The Centre assessments will then be subject to external moderation.
- Individual Candidate Record Cards and Coursework Assessment Summary Forms will be provided by the Examinations Council of Eswatini (ECESWA) and must be submitted to ECESWA by the official deadline, along with a representative sample of work and a teacher's file with the instructions of the practical exercises and investigatory project and their schemes of assessment.
- Where more than one teacher is involved in marking the work, the sample must include candidates marked by all teachers. Candidates must be selected so that the whole range is covered, with marks spaced as evenly as possible from the top mark to the lowest mark.

Sampling of practical exercises and investigatory projects should be done as follows:

Number of candidates entered	Number of candidates whose work is required (sample size)
0 - 10	All candidates
11 - 50	10
51 - 100	15
Above 100	20

NOTE: All records and supporting written work should be retained at the Centre until the publication of results.

The Teacher is required to assess the practical work carried out by candidates. This entails keeping a record for all the learners, showing the operations carried out and the marks awarded.

Essential 'field work' in Agriculture, should be given clear credit for practical ability.
Three discrete practical exercises and the investigatory project; involving Assessment Objective C should be assessed over the two-year programme.

APPENDIX 2: PHYSICAL AND CHEMICAL CONCEPTS AND PROCESSES

It is expected that students will demonstrate background knowledge of, and/or an increased depth of knowledge, in the following physical and chemical concepts and processes.

For the purpose of Assessment, candidates will be expected to demonstrate:

1. an understanding of temperature, pressure, evaporation and relative humidity;

2. an understanding of the terms element, mixture, compound, atom, molecule and ion;

3. an understanding of the terms acid, base and pH value;

4. an understanding of energy transfer/conversion.

APPENDIX 3: MATHEMATICAL REQUIREMENTS

Calculators may be used in all parts of the Assessment. Candidates should be able to:

1. add, subtract, multiply and divide;
2. understand averages, decimals, fractions, percentages, and ratios;
3. understand the relationship between surface area and volume;
4. use direct and inverse proportion;
5. draw charts and graphs, including histograms, from given data;
6. interpret charts and graphs;
7. select suitable scales and axes for graphs.

APPENDIX 4: TERMINOLOGY, UNITS, SYMBOLS AND PRESENTATION OF DATA FOR AGRICULTURE

Learners should be made aware of the terminology during teaching and practical work.

1. Numbers

The decimal point will be placed on the line, e.g., 52.35

Number from 1000 to 9999 will be printed without commas or spaces.

Number greater than or equal to 10 000 will printed without commas, a space will be left between each group of three numbers e.g., 4 256 789.

2. Units

The International System of units will be used (SI units). Units will be indicated in the singular not in the plural, e.g., 28kg.

(a) SI units commonly used in Agriculture are listed below.
Note: Care should be taken in the use of mass and weight. In many agricultural contexts, the term mass is correct, e.g., dry mass, biomass.

Quantity	Name of unit	Symbol for unit
length	kilometre, metre, centimetre, millimetre, micrometre.	km, m, cm, mm, µm
mass	tonnes, kilograms, grams, milligram, micrograms	t, kg, g, mg, µg,
time	year, day, hour, minutes, second	y, d, h, min, s
Amount of substance	mole	mol

(b) Derived units are listed below:

energy	kilojoule, joule	(kJ, J)

(c) Recommended units for area, volume, and density are listed below:

area	hectare(= 10^4 $m^{2)}$	ha
	square metre	m^2
	square decimetre	dm^2
	square centimetre	cm^2
	square millimetre	mm^2
volume	cubic kilometre	km^3
	cubic metre	m^3
	cubic decimetre (preferred to litre)	dm^3
	litre	dm^3 (not l)
	cubic centimetre	cm^3
	cubic millimetre	mm^3

density	kilogram per cubic meter	kg/m^3
	gram per cubic centimeter	g/cm^3

(d) The solidus (/) is to be used for separating the quantity and the unit in tables, graphs and charts, e.g., time / s for time seconds

3. Presentation of Data

(a) Tables

- Each column of a table will be headed with the physical quantity and the appropriate SI unit, e.g., time / min.
- The column headings of the table can then be directly transferred to the axes of a constructed graph.

(b) Graphs

- The independent variables will be plotted on the x-axis (horizontal axis) and dependent variable plotted on the y-axis (vertical axis).
- Each axis will be labeled with the physical quantity and appropriate SI unit, e.g time / min.
- The graph is the whole diagrammatic presentation. It may have one or several curves plotted on it.
- Points on the curve should be clearly marked as crosses (x) or circled dots ⊙. If a further curve is included, vertical crosses (+) may be used to mark the points.

(c) Pie Charts

These should be drawn with the sectors in rank order, largest first, beginning at 'noon' and proceeding clockwise. Pie charts should contain no more than six sectors.

(d) Bar Charts

These are drawn when one of the variables is not numerical, e.g., when one of the variables is quantitative for plotting the number of eggs against the colour of the eggs. They should be made of narrow blocks of equal width that do not touch.

(e) Column Graphs

These are drawn when plotting frequency graphs from discrete data, e.g., frequency of occurrence of nests with different numbers of eggs. They should be made up of narrow blocks of equal width that do not touch.

(f) Histograms

These are drawn when plotting frequency graphs with continuous data, e.g., frequency of occurrence of stems of different lengths, of chicks of different masses. The blocks should be drawn in order of increasing or decreasing magnitude and they should be touching.

N.B
Ensure there is a key for every graph where necessary.

APPENDIX 5: GLOSSARY OF TERMS

It is hoped that the glossary will prove helpful to candidates as a guide i.e., it is neither exhaustive nor definitive. The glossary has been deliberately kept brief with respect to the number of terms included but also to the descriptions of their meanings. Candidates should appreciate that the meaning of a term must depend, in part, on its context.

Agricultural development: all the attempts made to promote proper conditions for farming so that crop and animal production are done effectively to reduce hunger and poverty.

Agroforestry: a management system in which trees are grown among crops for conservation and efficient use of resources.

Bio-intensive integrated Pest Management: A systems approach to pest management based on an understanding of pest ecology which includes diagnosis of the nature and source of pest problems; and use of biological controls and reduced-risk pesticides.

Brooder: heating equipment for chicks.

Climate change adaptation: factors that enable living organisms to sustain themselves despite changes in climate.

Climate change mitigation: strategies meant to minimise effects of climate change.

Colostrum: the first milk produced by the mother which contains antibodies.

Conservation Agriculture (CA): A farming system that promotes minimum soil disturbance (i.e. No-till farming), maintenance of a permanent soil cover, and diversification of plant species.

Control: any factor that is held constant (controlled) in an experiment.

Desertification: the process by which fertile land becomes desert, typically as a result of drought, deforestation, or inappropriate agriculture.

Greenhouse effect: the increase in the average temperatures in the atmosphere caused by the accumulation of greenhouse gases which trap heat from the sun.

Indigenous knowledge systems (IKS): strategies, practices, techniques and knowledge systems that are unique to a given culture or locality.

Integrated pest management: a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks.

Limitations of the study: those constraints or characteristics of the research design or methodology that impacted or influenced the results and their application or interpretation.

Market research: The action or activity of gathering information about consumers' needs and preferences.

Productivity: applying the necessary skills and techniques to improve efficiency and maximize output.

Sustainable Agriculture: farming to meet society's present food and textile needs, without compromising the ability for current or future generations to meet their needs.

Treatment: It is the factor or the independent variable with two or more levels manipulated by the experimenter.

Implements: device that is larger than tools and requires greater power than manpower to operate them.

Layer: a bird or chicken raised for commercial egg production.

Steaming-up: the process of increasing feed ration during the late stages of pregnancy.

APPENDIX 6: COMMAND WORDS

The command words are important terms used in examinations, and this section attempts to define them. In all questions, the number of marks allocated is shown on the examination paper, and should be used as a guide by candidates on how much detail to give or time to spend in answering.

For example, in describing a process, the mark allocation should guide the candidate on how many steps to include. In explaining why something happens, it guides the candidate on how many reasons to give or how much detail to give for each reason.

CALCULATE Used when a numerical answer is required. In general, working should be shown, especially where two or more steps are involved.

DEDUCE Used in a similar way to "Predict" except that some supporting statement is required (e.g., reference to a law, principle, or the necessary reasoning is to be included in the answer).

DEFINE (the term(s) ...) is intended literally, only a formal statement or equivalent paraphrase being required.

DESCRIBE Requires the candidate to state in words (using diagrams where appropriate) the main points of the topic. It is often used with reference to data or information given in a graph, table or diagram, requiring the candidate to state the key points that can be seen in the stimulus material. Where possible, reference should be made to numbers drawn from the stimulus material. It can also require a candidate to give a step by step written statement of what happens during a particular process. In other contexts, describe should be interpreted more generally. (i.e., the candidate has greater discretion about the nature and the organisation of the material to be included in the answer). "Describe and explain" may be coupled, as may "State and explain".

DETERMINE Often implies that the quantity concerned cannot be measured directly but is obtained by calculation, substituting measured or known values of other quantities into a standard formula.

DISCUSS Requires the candidate to give a critical account of the points involved in the topic.

ESTIMATE Implies a reasoned order of magnitude statement or calculation of the quantity concerned, making such simplifying assumptions as may be necessary about points of principle and about the values of quantities not otherwise included in the question.

EXPLAIN May imply reasoning or some reference to theory, depending on the context. It is another way of asking candidates to give reasons for. The candidate needs to leave the Examiner in no doubt why something happens.

FIND Is a general term that may variously be interpreted as "Calculate", "Measure", "Determine", etc.

GIVE A reason or reasons is another way of asking candidates to explain why something happens.

LIST Requires a number of points, generally each of one word, with no elaboration. Where a given number of points is specified this should not be exceeded.

MEASURE Implies that the quantity concerned can be directly obtained from a suitable measuring instrument (e.g., length, using a ruler, or mass, using a balance).

OUTLINE Implies brevity (i.e., restricting the answer to giving essentials).

PREDICT Implies that the candidate is not expected to produce the required answer by recall but by making a logical connection between other pieces of information. Such information may be wholly given in the question or may depend on answers extracted in an earlier part of the question. Predict also implies a concise answer with no supporting statement required.

SKETCH When applied to graph work, implies that the shape and/or position of the curve need only be qualitatively correct, but candidates should be aware that, depending on the context, some quantitative aspects may be looked for (e.g., passing through the origin, having an intercept). In diagrams, sketch implies that simple, freehand drawing is acceptable; nevertheless, care should be taken over proportions and the clear exposition of important details.

STATE Implies a concise answer with little or no supporting argument (e.g., a numerical answer that can readily be obtained 'by inspection').

SUGGEST Used in two main contexts (i.e., either to imply that there is no unique answer (e.g., in Chemistry, two or more substances may satisfy the given conditions Describing an 'unknown'), or to imply that candidates are expected to apply their general knowledge to a 'novel' situation, one that may be formally 'not in the syllabus').

WHAT "What do you understand by"/ "What is meant by" (the term (s)...) normally implies that definition should be given, together with some relevant comment on the significance or context of the term(s) concerned, especially where two or more terms are included in the question. The amount of supplementary comment intended should be interpreted in the light of the indicated ma

APPENDIX 7: ASSESSMENT SUMMARY FORM

EGCSE AGRICULTURE – Practical Exercises Paper 3
Individual Candidate Record Card

Please read the instructions printed overleaf and the General Coursework Regulations before completing this form.

Centre Number							Centre Name			November	2	0		
Candidate Number							Candidate Name							

Brief description of Practical Exercises undertaken Practical Exercises	**Section B Processed Skills (25)**	**Section A Practical Skills (25)**				
		2 Responsibility (Assessment responsibilities) (5)	3 Initiative (Coping with problems) (5)	4 Technique (Tackling tasks systematically & methodically) (5)	5 Perseverance (Seeing a task through the end) (5)	6 Quality (Work is well finished and presented) (5)
1.						
2.						
3.						
Total per category add the processed skills marks out of 75 and the criterion marks out of 15. Final mark processed skills (x/75) x 15 Final mark criterion marks (x/15) x 3. **NB:** all marks should be rounded up. Marks to be transferred to Coursework Assessment Summary Form.	/75	/15	/15	/15	/15	/15
	/15	/3	/3	/3	/3	/3

EGCSE – AGRICULTURE COURSEWORK ASSESSMENT FORMS

A. INSTRUCTIONS FOR COMPLETING COURSEWORK ASSESSMENT SUMMARY FORMS

1. Complete the information at the head of the form.

2. Mark each practical exercise for each candidate according to instructions given in the Syllabus booklet.

3. Enter marks and total marks in the appropriate spaces. Complete any other section of the form as required.

4. Ensure that the addition of marks is independently checked.

5. Attach this form to the sampled candidate's practical activity work and retain until required for external moderation. Retain the unsampled practical exercises at the school.

6. Transfer the marks to the Practical Exercises Summary Form (6882/03/CW/S) in accordance with the instructions given on that document.

EGCSE AGRICULTURE – Investigatory Project Paper 4
Individual Candidate Record Card

Please read the instructions printed overleaf and the General Coursework Regulations before completing this form.

Centre Number						Centre Name		November	2	0		
Candidate Number						Candidate Name							

Brief description of Practical investigation undertaken comments on results, assessment and degree of guidance by teacher etc.	1 Topic/content/ bibliography max 5	2 Introduction max 5	3 Literature Review max 5	4 Methodology max 5	5 Results and Discussion max 5	6 Summary/ conclusion/ recommendation max 5	Total Max: 30
Marks to be transferred to coursework Assessment Summary Form	(max 5)	(max 5)	(max 5)	(max 5)	(max 5)	(max 5)	

6882/04/CW/)

EGCSE – AGRICULTURE COURSEWORK ASSESSMENT FORMS

A. INSTRUCTIONS FOR COMPLETING COURSEWORK ASSESSMENT SUMMARY FORMS

1. Complete the information at the head of the form.

2. Mark each practical exercise for each candidate according to instructions given in the Syllabus booklet.

3. Enter marks and total marks in the appropriate spaces. Complete any other section of the form as required.

4. Ensure that the addition of marks is independently checked.

5. Attach this form to the sampled candidate's practical activity work and retain until required for external moderation. Retain the unsampled practical exercises at the school.

Transfer the marks to the Investigatory Summary Form (6882/04/CW/S2) in accordance with the instructions given on that document.

AGRICULTURE – Practical Exercises Paper 3
Coursework Assessment Summary Form

Please read the instructions printed overleaf and the General Coursework Regulations before completing this

Centre Number						Centre Name			November	2	0		

Candidate Number	Candidate Name	Processed skills Max 15	Responsibility Max 3	Initiative Max 3	Technique Max 3	Perseverance Max 3	Quality Max 3	Total Mark Max 30

Name of teacher filling this form		Signature			Cell		Date	
Name of internal moderator		Signature			Cell		Date	

	Head teacher's Signature + Stamp

Please read the instructions printed overleaf and the General Coursework Regulations before completing this form (6882/3/CW/S1).

EGCSE – AGRICULTURE COURSEWORK ASSESSMENT FORMS (6882/03/CW/S1)

A. INSTRUCTIONS FOR COMPLETING COURSEWORK ASSESSMENT SUMMARY FORMS

1. Complete the information at the head of the form.
2. List the candidates in an order that will allow ease of transfer of information to a computer-printed Mark sheet MS1 at a later stage (i.e. in candidate index number order, where this is known;
   see item B.1 below). Show the teaching group or set for each candidate. The initials of the teacher may be used to indicate group or set.
3. Transfer each candidate's marks from his or her Individual Candidate Record Card to this form.
4. Both the teacher completing the form and the internal moderator (where appropriate) should check the form and complete and sign the bottom portion.

B. PROCEDURES FOR EXTERNAL MODERATION

1. Examinations Council of Eswatini (ECESWA) sends a computer-printed Coursework Mark Sheet MS1 to each Centre (in late March for June examination and in early October for the November examination) showing the names and index numbers of each candidate. Transfer the total internally moderated mark for each candidate from the Coursework Summary Form to the Computer-printed Coursework mark sheet MS1.
2. The top copy of the Computer-printed Coursework mark sheet MS1 must be dispatched in the specially provided envelope to arrive as soon as possible at ECESWA but no later than 31 October.
3. All candidates Coursework with all Individual Candidate Record Cards, this Summary Form and the second copy of MS1 must be sent to ECESWA by 31 October.
4. The name of the teacher assessing each candidate must appear on the front cover of the candidate's coursework.
5. Send, with the sample, instructions given to candidates and information as to how internal moderation was carried out.
6. If there are ten or fewer candidates, all the coursework that contributed to the final mark for all the candidates must be sent to ECESWA. Where candidates are between 11 – 50,
   send a sample of 10 candidates covering the full ability range. From 51 – 100 candidates send a sample of 15 candidates. Above 100 candidates, send a sample of 20 candidates.
   Mark the sampled candidates with an asterisk (*) on the summary form.

EGCSE AGRICULTURE – Investigatory Project Paper 4
Coursework Assessment Summary Form

Centre Number						Centre Name					November		2	0		
Candidate Number	Candidate Name						1 Topic/content /bibliography (max 5)	2 Introduction (max 5)	3 Literature Review (max 5)	4 Methodology (max 5)	5 Results and Discussions (max 5)	6 Summary conclusion /recommendation (max 5)	Total Mark Max 30			
Name of Teacher filling this form			Signature						Cell				Date			
Name of internal moderator			Signature						Cell				Date			
Head teacher's Signature + Stamp																

Please read the instructions printed overleaf and the General Coursework Regulations before completing this form (6882/4/CW/S2)

EGCSE – AGRICULTURE COURSEWORK ASSESSMENT FORMS (6882/04/CW/S2)

A. INSTRUCTIONS FOR COMPLETING COURSEWORK ASSESSMENT SUMMARY FORMS

1. Complete the information at the head of the form.
2. List the candidates in an order that will allow ease of transfer of information to a computer-printed mark sheet MS1 at a later stage (i.e. in candidate index number order, where this is known; see item B.1 below). Show the teaching group or set for each candidate. The initials of the teacher may be used to indicate group or set.
3. Transfer each candidate's marks from his or her Individual Candidate Record Card to this form.
4. Both the teacher completing the form and the internal moderator (where appropriate) should check the form and complete and sign the bottom portion.

B. PROCEDURES FOR EXTERNAL MODERATION

1. Examinations Council of Eswatini (ECESWA) sends a Computer-printed Coursework Mark Sheet MS1 to each Centre in early October for the November examination) showing the Names and index numbers of each candidate. Transfer the total internally moderated mark for each candidate from the Coursework Summary Form to the computer-printed Coursework Mark Sheet MS1.
2. The top copy of the Computer-printed Coursework mark sheet MS1 must be dispatched in the specially provided envelope to arrive as soon as possible at ECESWA but no later than 31 October.
3. All candidates Coursework with all Individual Candidate Record Cards, this Summary Form and the second copy of MS1 must be sent to ECESWA by 31 October.
4. The name of the teacher assessing each candidate must appear on the front cover of the candidate's coursework.
5. Send, with the sample, instructions given to candidates and information as to how internal moderation was carried out.
6. If there are ten or fewer candidates, all the coursework that contributed to the final mark for all the candidates must be sent to ECESWA. Where candidates are between 11 – 50, send a sample of 10 candidates covering the full ability range. From 51–100 candidates send a sample of 15 candidates. Above 100 candidates, send a sample of 20 candidates. Mark the sampled candidates with an asterisk (*) on the summary form.