



The Republic of Uganda

Ministry of Education and Sports

AGRICULTURE TEACHING SYLLABUS

Uganda Certificate of Education

Senior 1 - 4



National Curriculum Development Centre

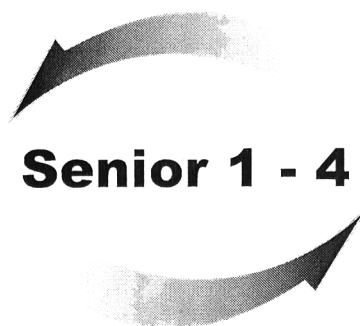
P.O. Box 7002

Kampala - Uganda

2008

AGRICULTURE TEACHING SYLLABUS

UGANDA CERTIFICATE OF EDUCATION



National Curriculum Development Centre

NATIONAL CURRICULUM DEVELOPMENT CENTRE (NCDC) UGANDA – 2008.

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ISBN 978-9970-117-01-7 (Paperback edition)

Published by:
National Curriculum Development Centre.

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ACKNOWLEDGEMENT

The National Curriculum Development Centre (NCDC) would like to express its appreciation to all those who worked tirelessly towards the production of this 'O' level (UCE) Curriculum Teaching syllabi.

Gratitude goes to the Ministry of Education and Sport for supporting the writing of the different subject syllabi. Our thanks also go to partners in education who provided the professional information and advice that was put together to come up with this teaching syllabus. These include Secondary Schools, Universities, National Teacher Colleges, Uganda National Examination Board (UNEB), Directorate of Education Standards (DES), Technical and Business Institutions, Private Organizations and Religious Organizations.

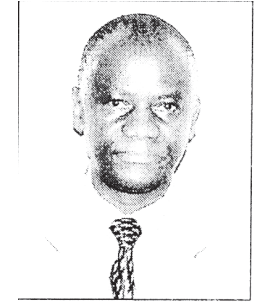
Last but not least we would like to acknowledge all those behind the scenes who formed part of the team that worked hard to finalize the work on the various syllabi.

The National Curriculum Development Centre (NCDC) takes responsibility for any shortcomings that might be identified in the publication and welcomes suggestions for effectively addressing the inadequacies.



Connie Kateeba
DIRECTOR,
National Curriculum Development Centre

FOREWORD



The educational experiences one goes through have a lot of bearing on the knowledge and skills acquired, attitudes development and consequently what one is able to do in achieving quality and successful life.

The teaching syllabuses for O-Level subjects will go a long way in achieving the government aims and objectives of education for all. For a long time each school has been developing its own teaching syllabuses. However, there has been need to standardize the various teaching syllabuses, in terms of scope and depth of the content in the various subjects for every school. This will provide detailed guidance to the teacher for scheming and lesson preparations. The syllabuses still leave room for the teacher to use his/her own creativity. These standardized syllabuses will guide the teaching/ learning process.

I appeal to all stakeholders to join hands and make the implementation of this educational process a success.

A handwritten signature in dark ink, appearing to read 'Dr. John Mbabazi'.

Dr. John Mbabazi
Director of Education
Ministry of Education and Sports.

SECTION 1

INTRODUCTION

This Teaching Syllabus is intended for the Ordinary Level Agriculture course in Uganda secondary schools. The syllabus gives guidance principally on what to be taught (content). This content is the same as what was introduced to secondary schools over three decades ago (1971), during the East African Examinations Council days. The content has however been repackaged to improve on effective implementation of the syllabus. The preliminary pages and the appendixes of this teaching syllabus also give useful information on how to implement this teaching syllabus in schools. Teachers and school administrators are urged to read, internalize and apply hints given in these sections so as to successfully implement this syllabus. High level of organization, commitment and interest in the subject on the part of the school agriculture teachers and head teacher is a requirement for success of this syllabus in secondary schools.

PURPOSE

Agriculture is the back bone of the Uganda Economy. It contributes to nearly 50% of GDP (Gross Domestic Product) and about 90% of the total exports. It is also the major foreign exchange earner which is needed for buying goods and services from overseas.

Majority of the Uganda population is engaged in agricultural production and therefore the agriculture sector is the key employer especially for the school leavers.

The Government policies on PEAP (Poverty Eradication Action Plan), PMA (Plan for Modernization of Agriculture) and USE (Universal Secondary Education) greatly demand that there should be knowledgeable and skillful Ugandans who can participate meaningfully in the implementation of these policies.

Majority of Ugandans still live below the poverty line and merely earn less than one dollar a day. To improve their daily earning, it is important to encourage them to embrace modern farming methods. This in part, could be achieved through agricultural education. Famine and hunger still linger among communities of Uganda and so the agricultural education would enlighten these communities on improved methods of farming to increase their levels of food production so as to ensure increase food security. While food production is increasing in arithmetic proportion the population is increasing at a geometric rate. There is therefore need to seek ways of matching the two so as to ensure adequate food supplies. Increased ill health among the population is not only caused by disease factor but also by inadequate nutritional levels. To alleviate the state of ill health the population needs information on nutrition and how to balance their diet. The level of Agricultural production is still low and mainly subsistence and this is attributed to the poor attitude towards agriculture by most of the elites who would have been knowledgeable to carry out booming agricultural production. This agricultural curriculum therefore will impact on the learners to actively and skillfully enhance agricultural production to satisfy the population's food and economic demands.

BROAD AIMS OF EDUCATION

- (i) To promote understanding and appreciation of the value of national unity, patriotism and cultural heritage, with due consideration of internal relations and beneficial inter-dependence;
- (ii) To inculcate moral, ethical and spiritual values in the individual and to develop self-discipline, integrity, tolerance and human fellowship;
- (iii) To inculcate a sense of service, duty and leadership for participation in civic, social and national affairs through group activities in educational institutions and the community;
- (iv) To promote scientific, technical and cultural knowledge, skills and attitudes needed to promote development;
- (v) To eradicate illiteracy and to equip the individual with basic skills and knowledge to exploit the environment for self-development as well as national development, for better health, nutrition and family life, and the capability for continued learning; and
- (vi) To contribute to the building of a integrated, self-sustaining and independent national economy.

AIMS AND OBJECTIVES OF SECONDARY EDUCATION

- (i) Instilling and promoting national unity and an understanding of social and civic responsibilities; strong love and care for others and respect for public property, as well as an appreciation of international relations and beneficial international co-operation.
- (ii) Promoting an appreciation and understanding of the cultural heritage of Uganda including its languages;
- (iii) Imparting and promoting a sense of self-discipline, ethical and spiritual values, personal and collective responsibility and initiative;
- (iv) Enabling individuals to acquire and develop knowledge and an understanding of emerging needs of society and the economy;
- (v) Providing up-to-date and comprehensive knowledge in theoretical and practical aspects of innovative production, modern management methods in the field of commerce and industry and their application in the context of socio-economic development of Uganda;
- (vi) Enabling individual to develop basic scientific, technological, technical, agricultural and commercial skills required for self-employment;

- (vii) Enabling individuals to develop personal skills of problem-solving, information gathering and interpretation, independent reading and writing, self-improvement through learning and development of social, physical and leadership skills such as are obtained through games, sports, societies and clubs.
- (viii) Laying the foundation for further education;
- (ix) Enabling the individual to apply acquired skills in solving problems of the community and to develop in him/her a strong sense of constructive and beneficial belonging to that community;
- (x) Instilling positive attitudes towards productive work and strong respect for the dignity of labour and those who engage in productive labour activities.

AIMS OF TEACHING AGRICULTURE

To enable the learner to:-

- Relate the value of agriculture to food security and welfare of the family, school, the community and the nation.
- Develop positive attitudes and interest in agriculture as a respectable occupation that is both profitable and honourable.
- Recognize the existing challenges and opportunities in agriculture as a major contributor to national development.
- Acquire in a practical manner basic principles and skills in agriculture to enable him/her to manage agricultural enterprises profitably for self-reliance and to contribute to agricultural modernization.
- Acquire background knowledge and skills for advanced studies in Agriculture.

SCOPE AND DEPTH

This teaching syllabus covers major areas of Agriculture namely:-

- Crop Production and Soil Science
- Animal Production
- Agricultural Mechanization
- Agriculture Economics

These broad areas have been divided into 34 topics which give the scope of this syllabus while the content is indicative of the depth of teaching of the syllabus.

TEACHING SEQUENCE

The topics have been sequenced per class and per term as shown in the table below. An estimate of time for each topic has been given. Duration of some topics may however overlap due to weather patterns and other factors. A teacher should therefore be flexible in the use of time.

CLASS	Term I		Term II		Term III	
	Topic	Periods	Topic	Periods	Topic	Periods
S.1	1. General Introduction to Agriculture	12	3b Introduction to Soil Science.	15	5. Introduction to Live stock production	21
	2. Principles of Land Use.	15	4. Introduction to Crop Production.	21	6. Introduction to Farm Mechanization	15
	3. Introduction to Soil Science.	09				
S.2	7. Soil Fertility	21	9. Vegetable Growing	12	1. Pig Production	15
	8. Principles of Crop Production	15	10. Production of Cereals and Legumes.	09	2. Farm Structures	15
			11. Poultry Production	15	3. Plant Propagation	06
S.3	15. Soil and Water Conservation	06	21. Cattle Production	21	22b. Perennial Crops	09
	16. Weeds and their Control	06	22. Perennial Crops	15	23. Crop Improvement	06
	17. Crop Pests and their control	06			24. Farm Implements and Equipment	09
	18. Crop Diseases and their control.	06			26. Land Tenure	06
	19. Root Crops.	06			27. Settlement and Resettlement Scheme.	03
	20. Field Crops	06				03
S.4	28. Farming Organisations	06	31. Farm Tractors	18	34. Agricultural Economics	12
	29. Grass Land Management	15	32. Goat Rearing	09		
	30. Fruit Crops	15	33. Sheep Rearing	09		

TIME ALLOCATION

Taking into consideration the proposed government policies of double shift classes and U.S.E. (Universal Secondary Education) the minimum time recommended on the school time table for agriculture per week is 3 periods of 40 minutes for Terms 1, 2 and 3 for all the classes Senior 1-4. According to Ministry of Education and Sports' annual calendar for schools, there are 12 weeks of effective teaching per term with exception of Senior 4 Term 3 due to early start of UNEB examinations.

MODE OF ASSESSMENT

Continuous assessment will be carried out by the teacher during teaching, at the end of the topic and at the end of the term. It will include oral questions, assignments, tests and practical activities. Final examinations will be conducted by Uganda National Examination's Board as indicated below.

EXAMINATION FORMAT

There will be two papers:-

Paper 1: Theory (2 ½ hours)

It will be divided into Part A and B

Part A will consist of five compulsory structured questions carrying

(20 marks)

Part B will consist of three sections, I, II, III. Nine questions will be set, three in each section. Candidates will be required to answer four questions including at least one question from each section.

(80 marks)

Section I: General farm structures and machinery, and agricultural economics (3 questions)

Section II: Crop production (3 questions)

Section III: Animal production (3 questions)

(100 marks)

Paper 2: Practical (2 hours)

All questions will be compulsory

(50 marks)

HOW TO USE THIS SYLLABUS

- This syllabus is a teaching syllabus and aims at assisting the teacher in drawing a comprehensive teaching scheme and making the lessons more effective and interesting.
- Time has been allocated to various topics in the syllabus. The time allocated for agriculture lessons within the normal school hours may not be adequate to cover all the content especially the practical activities. This requires timely planning and judicious use of the time available by the agriculture teacher. Time outside the normal schools hours may be sought to carry out students practicals.
- The topics have also been sequenced. However due to life spans of livestock and crops and varying weather patterns the teacher is advised to be flexible in execution of practical teaching and learning activities.
- Teachers are encouraged to use the specific objectives suggested to guide teaching and evaluation of the learning process. And the teacher is expected to develop more specific objectives in his/her schemes of work and lesson plans.
- The suggested teaching learning strategies are practical oriented to encourage teachers to handle the subject matter (content) practically.
- Assessment of the students work especially practicals should be done continuously.
- Materials including textbooks required for teaching/ learning topics in this syllabus have been suggested and both the teachers and the school are encouraged to gather and accumulate them within easy reach for effective and timely handling of practicals. (See Appendices 1 and 2). It should however be noted that the list is not exhaustive and the teacher is expected to improvise, substitute or suggest more relevant teaching resources when necessary.
- Each school offering Agriculture is expected to develop a school farm where students will carry out projects and scheduled practicals to compliment the work done in class. Some information to guide on management of a school farm has been given in this syllabus. (See Appendices 2, 4 and 5)

Hints on Conducting Practical

- The methods for teaching must be experiential and participatory methods including demonstration, experiments, practicals, farm visits, discussion and role plays. Specific farm technologies should be passed on to the learners in the process of using any of these methods.
- Practical or projects should be on the known crops and livestock of the local area with the objective of improving management.
- In such practicals, learners' activities such as observation, recording, measuring, calculations, construction, drawing and "hands-on" should be encouraged.
- The teacher should use resource persons to teach and demonstrate practical skills to the learners whenever necessary.
- School should provide the inputs to support teaching of practicals.
- There should be a programme for farm work prepared by the teacher.
- All agricultural activities carried by learners should be supervised or monitored by teachers to give guidance and to minimize accidents.
- After the practicals, the learners should be given time to clean themselves ready for the next school activity.
- The learner should benefit from the produce resulting from their practical skills so as to stimulate interest.
- Taking students to work in the farm should not be used as a form of punishment.

SECTION II

SENIOR 1 TERM I

TOPIC 1: GENERAL INTRODUCTION

DURATION: 12 PERIODS

GENERAL OBJECTIVE: The learner should be able to discuss the importance of Agriculture

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
1.1 Importance of agriculture.	• Explain the term “Agriculture” • Explain the importance of agriculture in the economy of Uganda	• Meaning of the term Agriculture • Importance of agriculture to a) Man b) The economy of the nation	• Brain storming on the term “agriculture”. • Class discussion on the importance of agriculture.
1.2 Introduction to farm layout.	• Identify the components of a farm. • Explain the factor to consider when siting the different components of a farm.	• The components of a farm: - buildings, animals, crops, water supplies, fields, roads, power-supply, workers. • Factors to consider when siting the different farm components. • Map of the school farm.	• Field trip to the farm to identify the components and then layout. • Discussion of the factors to consider when siting farm components.

TOPIC 2: PRINCIPLES OF LAND USE**DURATION: 15 PERIODS****GENERAL OBJECTIVE:** The learner should be able to explain the factors that determine land use forms

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
2.1 Forms of land use	- Describe the various forms of land use. - Explain the factors that determine the various forms of land use.	- Forms of land use: - agriculture - forestry - wildlife conservation - fishing - construction - mining - wetlands - Factors determining land use: - - Physical: - topography, soil type, vegetation, climate - Social :- culture of the people, land-tenure system, religious beliefs, population pressure, education level, knowledge and skills. - Economic:- capital availability market forces, price levels, entrepreneurship, power supply , infrastructure, transport and communication.	- Discussion on land use forms - Field trip to various places to relate land use forms to prevailing factors - Discussion of the factors determining land use forms.

TOPIC 2: PRINCIPLES OF LAND USE (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
2.2 Crop and livestock distribution	- Describe the distribution of crops and livestock according to the ecological zones of Uganda. - Explain the factors affecting the distribution of crops and livestock in Uganda	- Crop and livestock distribution in Uganda in relation to ecological zones. - Factors affecting the distribution of crops and livestock in Uganda	- Observation of crop and livestock distribution maps/ charts and discussion of distribution patterns - Discussion of the factors affecting distribution.
2.3 Important farming systems and practices	- Describe the different farming systems and practices in Uganda. - Group farming practices into traditional and modern farming practices. - Differentiate between : - commercial and subsistence farming - intensive and extensive farming - small and large scale farming	- Farming systems in Uganda:- - Teso system - Banana – Robusta coffee system - Northern system - West Nile system - Montane system - Pastoral system - Farming practices: - shifting cultivation - bush fallowing - crop rotation - mixed farming - lay farming - plantation farming - inter cropping - agro forestry - mixed cropping	- Field trips to observe and describe the features of the different farming systems. - Visiting fields to observe farming practices - Discussion of the farming practices.

TOPIC 3:**INTRODUCTION TO SOIL SCIENCE****(Continues to Term II)****DURATION: 24 PERIODS****GENERAL OBJECTIVE: Learners should be able to relate soil properties to crop production**

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
3.1 Soil constituents	• Explain the meaning of the term soil • Identify the constituents of soil. • Determine the presence and amounts of air and organic matter in soils.	• Definition of the term soil • Soil constituents: - mineral matter - organic matter - water - air - living organisms	• Brain storming • Observation of soil samples to identify mineral matter, organic matter and living organisms. • Conducting simple experiments to determine the presence and amounts of air, water and organic matter in soil samples.
3.2 Soil formation	• Describe the process of soil formation. • Define weathering • Explain different types of weathering. • Explain the factors affecting soil formation. • Explain the meaning of the term “soil profile”.	• The process of soil formation: -Physical weathering; agents of physical weathering (wind, running water, ice, temperature changes, plant roots, human and animal activities) - Chemical weathering: carbonation, oxidation, hydration, dissolution, hydrolysis - Transport and deposition (accumulation) of weathered material. - Invasion of the accumulated material by living organisms which provide organic matter. • Factors affecting soil formation: - Climate, parent materials, time topography, living organisms.	• Discussion of the process of soil formation • Field visits to various sites to observe activities that cause rock breakdown leading to soil formation. • Discussion of factors affecting soil formation

TERM II

TOPIC 3: INTRODUCTION TO SOIL SCIENCE (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
3.3 Soil profile	- Explain the meaning of the term “soil profile” - Describe the characteristics of the different horizons of soil profile. - Relate the characteristics of different soil profiles to plant growth	- Definition of soil profile - The horizons of the soil profile (A,B,C and D) and their characteristics - Soil profile and plant growth	- Brain storming on the meaning of soil profile. - Field visits to road side cutting or pits to observe and describe the different layers (horizons) of soil profile. - Constructing models to represent soil profiles
3.4 Properties of soil	- Describe the different properties of soil. - Explain the physical properties of soil. - Determine the texture of different soil samples - Determine the properties of soils with different textures. - Describe the different structure types found in soil. - Relate soil texture and structure to plant growth	- Properties of soil - Biological, - Chemical - Physical - Soil texture - Soil Structure and its effect on soil. - Types of soil structure - Platy - Prismatic - Columnar - Blocky - Granular - Crumb	- Discussion on properties of soil. - Mechanical analysis of soil samples to determine their texture. - Conducting simple experiment to determine the water drainage, infiltration and retention capacity of different soil samples. - Discussion and explanation of soil structure types with the aid of diagrams
3.5 Soil types	- Determine the different soil types. - Describe the properties of the different soil types - Relate the properties of the different soil types to plant growth	- Soil types: clay, loam and sandy soils. - Properties of the different soil types. - Soil properties and plant growth	- Conducting experiment to determine the different soil types and their properties. - Discussion of the properties of different soil types and their effects on plant growth.

TOPIC3: INTRODUCTION TO SOIL SCIENCE (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES	CONTENT	METHODOLOGY
3.6 Soil sampling	• Explain the importance of soil sampling. • Describe the methods of sampling soils. • Sample soils correctly	• Soil sampling - Reasons for sampling soils. - Equipment used in soil sampling - Methods of soil sampling - Procedure for soil sampling - Precautions to take when sampling soils.	• Discussion on the purpose and methods of soil sampling. • Demonstration of the soil sampling procedure.

TOPIC 4: INTRODUCTION TO CROP PRODUCTION**DURATION: 21 PERIODS****GENERAL OBJECTIVE:** The learner should be able to outline the factors that determine the level of crop production.

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
4.1 Factors affecting crop production	• Explain the factors that affect crop production	• Factors that affect crop production:- - Climate (temperature, humidity, wind, distribution of rain, rainfall intensity) - Soils - Knowledge level of the farmer - Markets - Availability and price of inputs - Pests and diseases - Natural hazards - Level of mechanization.	• Discussion of the factors that affect crop production.
4.2 Importance of crops to us	• Explain the ways in which crops are important to us.	• Importance of crops:- - Provision of food to humans and livestock - Medicine - Source of income - Raw materials for industries - Foreign exchange	• Discussion of the ways in which crops are useful to us.
4.3 Classification of crops	• Group crops according to given criteria (i.e life span, the useful part harvested, botanical group, purpose.)	• Groups of crops:- - Cereals - Species - Legumes - Perennials - Field crops - Root crops -Vegetables - Fruits - Medicinal	• Practical work involving learners sorting out crop plant specimen and grouping them according to specified criteria

TERM III

TOPIC 5: INTRODUCTION TO LIVESTOCK PRODUCTION

DURATION: 21 PERIODS

GENERAL OBJECTIVE: Learner should be able to explain the principles that govern livestock production

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
5.1 Importance of livestock	Explain the ways in which livestock are useful to us	- Importance of livestock:- - Provision of food (meat, milk, eggs) - Income -Manure -Hides and skins -Provision of power for farm work	- Discussion of the value of livestock - Observation of various livestock products.
5.2 Factors affecting livestock production	Explain the factors that affect livestock production.	- Factors affecting livestock production:- - Diseases and parasites - Climate -Availability of land/space -Availability of water - Market - Vegetation / pastures	Discussion of the factors that affect livestock production
5.3 Types and breeds of livestock	- Name the different type of livestock. - Describe the different breeds of livestock. - State the purpose for which the different breeds of livestock are kept.	- Types of livestock: poultry, cattle, goats, pigs, sheep, rabbits, fish, bees. - Breeds of poultry, cattle, goats, pigs, sheep and rabbits. - The purpose (s) of keeping the different breed of livestock	- Farm visit to observe the characteristics of different breeds of livestock - Discussion of the purposes of keeping different breeds of cattle.

TOPIC 5: INTRODUCTION TO LIVESTOCK PRODUCTION (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
5.4 Principles of livestock management	• Describe the various livestock management practices carried out on a farm. • Explain the reasons for carrying out the various livestock management practices. • Explain hygiene/ sanitation in the management of livestock.	• Principles of livestock management:- - Feeding - Housing - -Parasite and disease control (hygiene/ sanitation to be emphasized) - breeding • Other management practices - Identification - Dehorning - Castration - Grooming - Docking - De-beaking - Hoof trimming	• Demonstration of the various livestock management practices • Discussion of the importance of the livestock management practices

TOPIC 6:**INTRODUCTION TO FARM MECHANISATION****DURATION: 15 PERIODS****GENERAL OBJECTIVE:** The learner should be able to explain the maintenance and use of farm machines.

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
6.1 Importance of farm machines and equipment	• Explain what is meant by agricultural mechanisation • Give reasons to explain the importance of using machines and equipment in farming	• Agricultural mechanisation. - Meaning and examples of common farm machinery and equipment • Importance of farm machines and equipments:- - increased quantity and quality of products - timeliness of farming operations - efficiency in production - reduced drudgery - saving time	• Brain storming on concept of agricultural mechanisation. • Discussion of the importance of using farm machines and equipments.
6.2 Limitations of using farm machine and equipments	• Explain the limitations of using farm machines and equipments.	• Limitations and challenges of using farm machines and equipments - expensive to buy and maintain . - lack of technical knowledge and skills -difficult terrain and soils -need for large land area - lack of spares	• Discussion of the limitations of using machines and equipment.
6.3 Sources of farm power	• Identify the sources of farm power • Explain the advantages and limitations of the various sources of farm power.	• Sources of farm power:- -human power - animal power -solar power -wind power -electrical power -engine power • Advantages and limitations of farm power sources.	• Discussion of the sources of farm power and their advantages and limitations. • Field visits to observe how the various farm power sources are being harnessed.

TOPIC 6: INTRODUCTION TO FARM MECHANISATION (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
6.4) Types of machines on the farm	- Identify the different types of farm machines and equipments. - State the uses of the farm machines and equipments. - Maintain farm tools and equipments in good working condition.	- Types of machines on a farm: - farm tractors - tractor –drawn implements - animal-drawn implements - produce processing machines - Farm hand tools - Uses of farm machines and tools - Maintenance of farm machines, equipment and tools: - oiling/greasing -sharpening -mending/repairing -replacement of worn-out parts. -proper storage -cleaning -adjusting	- Observation and description of the machines and equipment on a farm. - Discussion of the uses of the machines and equipment on a farm. - Practical work on maintenance of simple farm tools and equipment.

SENIOR TWO TERM I

TOPIC 7: SOIL FERTILITY

DURATION: 21 PERIODS

GENERAL OBJECTIVE: To enable the learner improve and maintain soil fertility for crop growth

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
7.1 Factors that affect soil fertility	- Explain the concept of soil fertility. - Explain the factors that contribute to soil fertility	- Meaning of soil fertility - Factors that contribute to soil fertility: - Soil structure - Soil texture - Water holding capacity - Soil PH - Organic matter - Mineral nutrients - Soil organisms - Soil temperatures	Guided discussion on concept and factors that contribute to soil fertility.
7.2 Ways in which soil loses fertility	- Explain the ways in which the soil loses its fertility. - Identify Nitrogen, Phosphorus, Potassium deficiency symptoms on crops. - Distinguish between poor and good soils for crop production	- Ways in which soil loses fertility - Soil erosion - Continuous cropping - Monoculture - Leaching - Crop removal - Burning - Volatilisation - Immobilization - Signs of poor soils.	- Observation of soils with low productivity and high productivity. - Identification of crops showing nutrient deficiency symptoms.
7.3 Maintenance of soil fertility	Demonstrate appropriate methods of maintaining soil fertility	- Maintenance of soil fertility - Crop rotation - Use of organic manures - Use of inorganic manure and soil amendments e.g. use of lime on acidic soils	Demonstration on use of the soil conservation measures, wind breaks and organic manures.

TOPIC 7: SOIL FERTILITY (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
		- Use of organic mulches - Tillage practices - Soil and water conservation	Practicals on : • Application of manure /fertilizers on infertile soils and observe response • Application of lime on acidic soils • Controlling pests
7.4 Plant Nutrients	• Explain the differences between macro and micro soil nutrients. • Explain the uses of major plant nutrients in plant growth • Explain the deficiency symptoms and effects of excessive plant nutrients. • Identify the sources of soil nutrients. • Explain the nitrogen and carbon cycles and their effects on soil fertility	• Macro nutrients N, P, S, K, Ca, Mg • Micro nutrients; Fe, Cl, Mo, Zn, Bo, Co, Cu. For each macro nutrient consider:- - Uses in a plant - Deficiency symptoms - Effects of excessive nutrients. - Sources • Nitrogen cycle • Carbon cycle	• Guided discussion on the:- - Difference between macro and micro nutrients. - Uses of plant nutrient and their deficiency symptoms. • Observation of crop plants grown in culture solutions • Analysing the nitrogen cycle chart & carbon cycle chart. • Fields visits to study and identify nutrient deficiency symptoms.
7.5 Organic manures	• Distinguish between the different types of organic manures.	• Types of organic manures - Farm Yard Manure -Compost manure -Green manure -Organic mulches	• Observations of different organic manures

TOPIC 7: SOIL FERTILITY (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
	Demonstrate the methods of making different types of manures	- Description of the different types of green manure - Characteristics of green manure - Methods of making manure - Factors affecting quality -Uses/importance of application - Methods of application	• Carry out practicals on preparation of organic manures • Observe and discuss legume plants as a green manure.
7.6 Inorganic manures	- Classify inorganic fertilizers according to major elements supplied and their characteristics - Apply inorganic fertilizers appropriately to crops - Explain the advantages and disadvantages of artificial fertilizers. - Identify the characteristic of a good fertilizer.	• Classification according to: - major elements supplied (N, K, P fertilizers) - the number of major elements contained (straight/simple fertilizer and compound/mixed fertilizer) • Characteristics of N, P, and K fertilizers. • Methods of application • Factors to consider when applying fertilizers • Advantages and disadvantages of artificial fertilizers • Characteristics of a good fertilizers	• Guided discussion on types and use of inorganic fertilizers • Observation of different fertilizers • Demonstration of fertilizer use.

TOPIC 8:**PRINCIPLES OF CROP PRODUCTION****DURATION: 15 PERIODS****GENERAL OBJECTIVE:** To enable the learner to acquire and use the knowledge and skills of growing crops.

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
8.1 Land clearing	• Explain the purpose of land clearing • Demonstrate the ways of land clearing.	• Purpose of land clearing • Methods of land clearing • Land reclamation including -Irrigation -Drainage	• Practical session on land clearing • Farm visit to see irrigation in practice • Discussion on drainage.
8.2 Seed bed preparation	• Explain the importance of seed bed preparation • Distinguish between primary and secondary tillage. • Demonstrate the various methods of preparing the seed bed. • Explain the advantages and disadvantages of different types of seedbeds.	• Importance of seedbed preparation • Types of tillage - primary tillage - secondary tillage • Methods of preparing seed bed - hand method -ox-cultivation - mechanical method ➤ Advantages and disadvantages of each. • Types of seedbeds - elevated/raised seedbed - sunken seedbed - flat seedbed	• Guided discussion and practical demonstration on methods of tillage and preparation of different types of seedbeds. • Guided discussion on the advantages and disadvantages of different types of seed beds.

TOPIC 8: PRINCIPLES OF CROP PRODUCTION (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
8.3 Planting	• Select good quality seeds from a seed lot and carry out seed dressing. • Apply the recommended planting practices.	• Seed selection and treatment • Planting - Seed rate - Spacing - Planting depth - Planting methods (their advantages and disadvantages)	• Explanation and practical demonstration of selecting planting materials • Demonstration of planting according to recommended spacing and depth
8.4 Field maintenance practices	• Maintain a crop using the recommended field practices • Tell when a crop is ready for harvesting. • Use the right method of harvesting the crop.	• Crop management - Thinning - Gap filling - Weeding - Fertilizer/manure application - Staking - Pruning - Pest and disease control - Harvesting.	• Discussion and practical demonstration of field maintenance practices.
8.5 Post harvest practices	• Process, store and market crop produce after harvesting	• Processing • Storage • Marketing	• Demonstrations and practicals on processing and storage of crop products. • Guided discussion on methods of processing, storing and marketing of crop produce.

TERM II

TOPIC 9: VEGETABLE GROWING

DURATION: 12 PERIODS

GENERAL OBJECTIVE: To enable the learner acquire and use knowledge of growing vegetables profitably

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
9.1 Vegetable Growing	- Explain the importance of vegetable growing. - Classify vegetable crops according to families. - Choose a suitable site for growing vegetables.	- Importance of vegetables. - Classification of vegetables. - Choosing a site for a vegetable garden.	- Guided discussion - Demonstration of how to choose a garden for a chosen vegetable.
9.2 Nursery management	- Construct a good nursery bed. - Plant seeds - Care for seedlings in a nursery i.e. shading, watering, pest and disease control and pricking out.	- Establishing a Nursery - Site selection for a nursery - Nursery bed preparation - Manuring and soil sterilization - Planting in a nursery - Managing a Nursery - Watering - Weeding - Spraying against pests and diseases - Pricking out - Hardening off - Potting if need be.	Practical demonstration of siting, establishing and managing nursery.
9.3 Transplanting	Transplant seedlings	- Transplanting - Timely transplanting - Spacing - Digging planting holes - Manuring/fertilizers application - Lifting seedlings from the nursery - Placing them in the holes and covering with soil - Provision of shade - Watering the seedlings	- Demonstration of transplanting seedlings. - Practicals on transplanting.

TOPIC 9: VEGETABLE GROWING (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
9.4 Field management practices.	• Manage a vegetable crop up to and harvest.	• Field management practices:- - Transplanting - Watering - Pest and disease control - Pruning - Staking - Manuring - Weeding - Harvesting	• Practical demonstration on - Pruning - Staking - Harvesting • Project work on growing vegetables.
9.5 Post-harvest practices.	• Process and store crop produce appropriately.	• Post-harvest practices - Processing - Storage - Marketing	• Practical demonstration of washing tomatoes, sorting and grading, storing, packing. • Market visit to see vegetable marketing
9.6 Vegetable rotation	• Explain the principles of vegetables rotation • Design a good vegetable rotation	• Principles of vegetable rotation - Advantage of vegetables rotation - Examples of possible vegetable rotation.	• Guided discussion • Demonstration of rotation in the school garden.
9.7 Production of various classes of Vegetables. E.G. • Tomatoes • Cabbage • Onion	• Grow vegetables successfully at school and also at home.	For each vegetable crop cover: • Varieties -Plant characteristics -Ecology • Agronomic practices • Processing, storage, marketing	• Guided discussion • Demonstration of the various practices of vegetable growing. • Project work on the growing of vegetable crops.

TOPIC10:**PRODUCTION OF CEREALS AND LEGUMES.****DURATION: 9 PERIODS****GENERAL OBJECTIVE:** To enable the learner acquire and apply the knowledge and skills of growing cereal crops profitability.

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
10.1 Introduction to cereals production	• Explain the importance of cereals • Identify the characteristics of cereal crops	• Importance of cereals • Characteristics of cereals • Examples of cereals	• Guided discussion and practical observation of cereal crop- maize, millet, rice, sorghum
10. 2 Growing of a cereal crop ▪ Maize ▪ Millet ▪ Sorghum	• Explain the importance of the crop • Accurately described the cereal crop using its botanical characteristics • Describe the agronomic practices involved in the growing of the chosen cereal crop	• Importance of the crop • Plant characteristics • Ecological requirements • Methods of propagation • Agronomical practices • Post-harvest practices	• Guided discussion and project work on growing cereal crops
10. 3 Introduction to legume production	• Explain the importance of legumes • Accurately describe the leguminous crop using its botanical characteristics	• Importance of legumes • Characteristics of legumes	• Guided discussion • Observation of legume crops:- beans, peas, ground nuts, soya beans
10.4 Growing of legume crops ▪ Beans ▪ Peas ▪ Ground nuts ▪ Soya ▪ Beans	• Describe the ecological requirements and agronomic practices involved in the growing of the chosen leguminous crops	• Plant characteristics • Ecological requirements • Methods of propagation • Agronomic practices • Post-harvest practices	• Project work on growing legume crops

TOPIC 11:**POULTRY PRODUCTION****DURATION: 15 PERIODS****GENERAL OBJECTIVE:** To enable the learner acquire and utilize knowledge and skills of rearing poultry profitably.

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
11.1 Introduction to poultry keeping.	• Explain the importance of poultry farming. • Outline the problems associated with poultry keeping in Uganda. • State the requirement for starting poultry project. • Identify the parts of a domestic fowl • Distinguish between the different breeds and types of poultry.	• Importance of poultry keeping in Uganda. • Problems associated with poultry keeping in Uganda. • Requirements for starting a poultry project. • Points of a domestic fowl • Types and breeds of domestic fowls.	Guided discussion on the importance of keeping poultry in Uganda. • Group discussion and presentation on problems associated with poultry keeping in Uganda and the requirements for starting a poultry project. • Observation of the parts of a fowl and the breeds of poultry
11.2 Breeding in Poultry.	• Draw and label the male and female reproductive systems of a fowl. • Identify the parts of an egg. • Explain the process of egg formation.	• Reproductive system of a cock. • Reproductive system of a hen • Structure of an egg. • The process of formation of an egg.	• Observation of the parts of the reproductive system of a male and female fowl. • Observation of the parts of an egg. • Guided discussion on the processes of egg formation.
11.3 Incubation of eggs.	• Explain the conditions necessary for proper hatching of eggs. • Explain the criteria used for choosing hatchable eggs. • Describe the methods of incubating eggs. • Identify female and male chicks using their distinguishing characteristics.	• Factors necessary for hatching of eggs. • Selection of eggs for incubation. • Methods of incubation (a) Natural method (mother hen) (a) Artificial incubation • Sexing of day-old chicks	• Guided discussion on conditions necessary for hatching eggs; the criteria used in selecting hatchable eggs and the criteria for identifying female chicks.

TOPIC 11: POULTRY PRODUCTION (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
11.4 Brooding	- Describe the various systems of brooding chicks. - Distinguish between different types of brooders. - Prepare a brooder for receiving day old chicks. - Participate actively in the management of chicks in a brooder. - Explain the causes of chick mortality.	- Natural brooding - Artificial brooding - Types of brooders. - Preparation of a brooder. - Management of chicks - Feeding of chicks - Housing - Health management - Causes of mortality of chicks in a brooder	- Guided discussion on the various systems of brooding chicks. - Demonstration and a practical session on preparing a brooder. - Demonstration and practical session on feeding, housing and maintenance of hygiene in poultry houses.
11. 5 Rearing of laying birds and Table birds.	- Describe the system of rearing birds and the advantages and disadvantage of each. - Correctly carry out the recommended practices used in rearing laying and table birds.	- Systems of rearing birds. - Advantage and disadvantage of the system - Shelters used - Rearing laying birds:- - Housing - Management of litter - Feeding of laying and table birds - Health management (culling) - Egg collection	- Guided discussion on the systems of rearing laying and table birds. - Demonstration and practical session on feeding, watering, egg collection, culling and health management of laying and table birds. - Projects : - Rearing layers - Rearing table birds
11.6 Digestion in birds	- Identify the parts of the digestive system of a bird. - Describe the process of digestion in a bird. - Distinguish between the different types of feeds given to poultry.	- Feeding in birds. - Digestive system of a chicken - Process of digestion in a bird - Poultry feeds and feeding	- Observation of the parts of the digestive system of a bird. - Observation of the types of feed given to birds.
11. 7 Poultry diseases (new castle, coccidiosis, BWD, typhoid, fowl pox)	- Name the causal organisms of major poultry diseases - Describe the symptoms, prevention and treatment of major poultry diseases.	- Poultry diseases - Identification of sick birds. - Causal organism - Symptoms - Prevention and treatment.	- Guided discussion of symptoms, prevention and treatment of poultry diseases. - Farm Visit to observe signs of sickness in birds.

TOPIC 11: POULTRY PRODUCTION (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
11. 8 Poultry parasites (lice, mite, tape worms, round worms)	- Identify poultry parasites. - Identify the parts of poultry parasites - Describe the life cycles of poultry parasites. - Describe the nature of damage, effect and control of parasites on poultry	- Identification of parasites. - external parasites - internal parasites - parts of the parasites - Life cycles of poultry parasites. - Nature of damage/effects and control measures of poultry parasites	- Observation of different poultry parasites and their parts - Guided discussion of the damage, effects and control of poultry parasites. - Guided discussion on the life cycle of poultry parasites.
11. 9 Vices in poultry.	Explain the types of vices in poultry houses and their prevention	- Vices in poultry. - Types of vices in poultry;- egg eating, toe pecking , feather pecking, cannibalism, vent pecking - Causes of vices in poultry - Preventive measures	- Observation of effect of vices in poultry houses - Discussion of cause, effects and prevention of vices
11. 10 Egg processing.	Handle and process eggs properly and prepare them for marketing.	- Egg processing - Egg handling - Egg candling - Cleaning of eggs - Abnormalities in eggs and their causes - Packaging and storage	Demonstration and practical sessions on handling, candling, packaging and storage of eggs.
11. 11 Grooming of birds.	- Explain the purpose of grooming birds - Groom a bird correctly	- Grooming of birds. - Purpose - Procedure	- Discussion on the objectives of grooming - Demonstration and practical session on grooming of birds
11. 12. Caponisation.	- Explain the importance of caponisation - Explain the methods of caponisation	- Meaning and importance of caponisation. - Methods of caponisation	Discussion on the meaning, objectives and methods of caponisation.

TERM III

TOPIC 12: PIG PRODUCTION

DURATION: 15 PERIODS

GENERAL OBJECTIVE: To enable the learner apply knowledge and skills in raising pigs profitably

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
12.1 Introduction to pig production.	- Explain the importance of pig production. - Identifying challenges associated with pig production. - Identify the points of a pig. - Distinguish between different breeds of pigs.	- Introduction to pig production - Importance - Challenges associated with pig production. - Points of a pig. - Breeds and types of pigs.	- Brain storming on the importance and problems associated with pig production. - Observation and identification of the points of a pig and the characteristics of different breeds of pigs.
12. 2 Breeding pigs.	- Explain the criteria for selection of pigs for breeding. - Describe the different systems of breeding in pigs. - Describe the reproductive system of a boar and a sow. - Identify the signs of heat , pregnancy and farrowing in pigs - Care for a pregnant sow. - Care for pigs when farrowing.	- Selection of pigs for breeding. - Breeding systems. - Reproduction in pigs - Reproductive systems of a boar and a sow. - Signs of heat. - Signs of pregnancy. - Care of a pregnant sow. - Farrowing	- Brainstorming on the criteria for selecting pig breeds. - Guided discussion on the systems of breeding in pigs. - Observation of the reproductive systems, signs of heat and pregnancy in sows. - Practical session on care of pregnant sow and farrowing.
12..3 Management of pigs	- Manage pigs - Care for pigs when farrowing	- Housing of pigs. - Management of ; i) Sow soon after farrowing ii) Boar iii) Litter/piglets iv) Growers	

TOPIC 12: PIG PRODUCTION (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
12.4 Nutrition in pigs	- Identify different pig feeds - Draw and label the digestive system of a pig.	- Feeds and feeding in pigs - Creep feeding - Digestive system of a pig	- Observation and identification of the different types of pig feeds. - Identification of different parts of the digestive system of a pig.
12.5 Pig diseases and parasites	- State causes, symptoms and control measures of pig diseases - Identify a sick pig by looking at the symptoms - Draw and label diagrams of pig parasites - State the effects of parasites on host animals and identify infected hosts. - Administer drugs of controlling/treating pig diseases and parasites.	- Pig diseases - Causal organism - Symptoms - Control measures - Parasites in pigs. - Examples of pig louse, mange, tapeworm, round worm - Anatomy/structure of parasites - Life cycle of the parasites - Effects of parasites on host - Control /Treatment of the Parasites	- Discussion on the symptoms and control of diseases - Observation and identification of some specimen of pig parasites. - Observe pigs infected by some parasites.
12. 6 Record keeping in a pig enterprise	Keep records in a pig enterprise.	- Records - Importance of keeping records - Type of records	- Observe the already prepared pig records in the farm. - Participate practically in recording information in the record sheets.

TOPIC 13:**FARM STRUCTURES****DURATION: 15 PERIODS****GENERAL OBJECTIVE:** To enable the learner acquire and use the knowledge and skills of construction and maintaining farm structures.

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
13.1 Fencing.	• Explain the importance of fencing • Describe the different types of fences and advantages and disadvantages of each. • Protect fencing poles • Participate effectively in construction of a barbed wire fence.	• Importance of farm fencing • Types of fences - Materials used - Advantage and disadvantage of different types of fences • Treatment of fencing poles • Construction of a barbed wire fence	• Guided discussion on importance of fences. • Visiting and observing different types of fences. • Practical demonstration of :- - Treatment of fencing poles. - Constructing a barbed wire fence.
13. 2 Farm buildings.	• Explain qualities of a good building. • Identify the different building materials and state advantages and disadvantages of each. • Estimate quantities of building materials. • Select a site for the various farm buildings.	• Farm buildings - Importance - Types. - Qualities of a good farm building. - Building materials - Parts of a farm building (foundation, walls, roof frame) • Factors considered when siting a farm building • Maintenance of farm buildings	• Observation of different types of buildings in the school and farm. • Discussion of advantages and disadvantages of building materials. • Discussion on the maintenance of buildings. • Observation of buildings to identify parts. • Demonstration and practical session on mixing mortar, concrete; and brick making calculating building materials.

TOPIC 15: FARM STRUCTURES (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
	• Make simple designs of farm buildings • Explain the possible reasons that may cause building to collapse.	• Simple design of buildings - Pigsty - Poultry Houses - Calf pen - Dairy barn - Farm stores - Maize Crib • Causes of collapse of buildings.	• Observation of different types of building designs. • Discussion on causes of failure/collapse of buildings.
13.3 Animal handling lay-outs	• Explain how animal handling lay-outs are used. • Participate in the use of a cattle crush	• Crushes – types • Cattle Dip • Spray race Consider the following for each :- - Purpose - Design - Advantages and limitations - How they are used - Maintenance	• Guided discussion of animal handling structures. • Observation of designs of animal handling structures. • Practical demonstration of how they are used. • Discussion of the advantages and disadvantages of the different animal handling layout.
13.4 Farm water supply	• Explain the importance of water in a farm • Identify water sources. • Practice water storage • Treat water for consumption.	• Farm Water - Importance of water on the farm - Sources of farm water: - springs wells, boreholes, rain and piped water.) - Water storage:- reservoirs, dams, over head tanks - Maintenance of water storage facilities - Distribution of water on the farm - Methods of water treatment.	• Discussion of the importance of and sources of water on the farm. • Observation of water - Storage structures - Distribution system on the farm. • Demonstration of methods of water treatment.

TOPIC 14:**PLANT PROPAGATION****DURATION: 6 PERIODS****GENERAL OBJECTIVE:** To enable the learner to effectively propagate different crops to ensure optimum plant population

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
14. 1Method of plant propagation.	• Explain the term plant propagation. • Give reasons for propagating plants. • Describe the methods of propagating plants • Explain advantages and disadvantages of seed and vegetative propagation	• Plant propagation - Meaning - Importance - Methods • Advantages and disadvantages of seed propagation • Importance of vegetative plant propagation: - Resistance to diseases. - Changing the top of a tree to a desirable one. - Growing more than one type of fruit or flower on one tree. - Allowing the use of stocks with desirable characteristics. - Multiplying clones - Obtaining special plant forms	• Brainstorming on the meaning of plant propagation. • Discussion on the importance of and methods of plant propagation.
14..2 Vegetative plant propagation	• Propagate selected plants.	• Methods of vegetative plant propagation - Budding - Grafting (side, cleft, notch, bark, approach, tongue) - Layering	• Demonstration of budding, grafting and layering.

SENIOR THREE TERM I

TOPIC 15: SOIL AND WATER CONSERVATION

DURATION: 6 PERIODS

GENERAL OBJECTIVE: To enable the learner conserve soil and water to sustain high crop production

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
15.1 Soil Erosion	• Explain the term soil erosion • Describe the causes, agents and effects of soil erosion	• Soil erosion - Meaning - Causes - Agents - Types - Effects	• Brainstorming on the definition of soil erosion • Field visits to eroded sites to identify the causes and agents of erosion and to describe the effects of erosion.
15.2 Soil and water conservation	• Explain the meaning of soil conservation and water conservation • State the importance of soil and water conservation • Describe the methods of soil and water conservation • Carry out simple soil and water conservation measures	• Soil conservation and water conservation. - Meaning - Importance - Methods of soil and water conservation; terracing, cut-off drains, diversion channel, grassed water ways, contour ridges, crop rotation, strip cropping, mulching, planting trees, bunds, contour ploughing, mulching, windbreaks.	• Brain storming on meaning of soil and water conservation. • Discussion on importance of soil and water conservation. • Field visits to observe and describe soil and water conservation structures. • Construction of simple soil and water conservation structures.

TOPIC 16: SOIL AND WATER CONSERVATION (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
15.3 Trees in soil and water conservation	• Explain the ways in which trees contribute to soil and water conservation • Raise tree seedlings • Plant trees in selected areas to control erosion and conserve water	• Importance of trees in soil and water conservation - Windbreaks - Roots hold soil in place - Leaves decompose to provide organic matter that holds soil particles together. - Vegetation cover reduces the impact of rain drops, improves absorption of water by soil and consequently the speed of water/surface of run-off. • Growing trees for soil and water conservation - Selecting suitable local tree species for soil and water conservation - Raising tree seedlings - Planting and care of trees	• Discussion on the role of tree in conserving soil and water. • Raising tree seedlings. • Planting tree. • Managing trees in the field.

TOPIC 16: WEEDS AND THEIR CONTROL**DURATION: 6 PERIODS****GENERAL OBJECTIVE: To enable the learner effectively control weeds**

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
16.1 Economic importance of weeds	• Explain what is meant by the term weed. • Explain the ways in which weeds are important to us.	• What is meant by the term weed? • Economic importance of weeds. - Advantage of weeds - Disadvantages of weeds	• Brainstorming • Discussion on advantages and disadvantages of weeds.
16. 2 Classification of weeds	• Identify and classify common weeds.	• Classification of weeds - Annual and perennial - Broad-leaved and narrow leaved. - Terrestrial and aquatic - Grasses, sedges, herbaceous, woody	• Collecting weed specimens, identifying and classifying them. • Preserving weeds.
16.3 Adaptation of weeds to the environment	• Explain the ways in which weeds are adapted to the environment for survival.	• Adaptation of weeds to the environment:- - Production of many seeds. - Efficient dispersal mechanisms. - Resistance to disease and pests. - Dormancy of seeds in unfavorable conditions. - Hardiness i.e. surviving in less fertile soils and little moisture.	• Discussion of the weed adaptation mechanisms. • Observation of weed specimens to identify and describe the features by which they survive.
16.4 Control of weeds.	• Describe measures taken to control weeds. • Carry out measures to control weeds.	• Weed control methods - Cultural - Mechanical - Chemical - Biological - Integrated weed management	• Discussion of the weed control methods. • Demonstration of the methods of weed control • Practicing the methods of weed control

TOPIC 17:**CROP PESTS AND THEIR CONTROL****DURATION: 6 PERIODS****GENERAL OBJECTIVE:** To enable the learner effectively control crop pests

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
17.1 Importance of pests in crop production	• Explain the term pest • Explain the ways in which pests affect crop production	• Meaning of the term pest. • Importance of pests in crop production - Lower quality and quantity of yield. - Increased cost of production - Making harvesting difficult - Transmission of diseases	• Brainstorming and explanation • Discussion on importance of crop pests. • Observation of crop plants/ parts and products damaged by pests.
17. 2 Damage caused by pests.	• Describe the types of damage caused by pests on crop plants and their products.	• Pest damage - Biting and chewing plant parts - Sucking plant sap - Boring into plant parts - Distorting plant parts.	• Observation of various types of damage on crop plants and products and describing them.
17. 3 Classification of pests.	• Identify and classify crop pests.	• Classification of crop pests: - Regular and irregular - Minor and major - Chewing and sucking - Field and storage pests.	• Discussion on the ways of classifying pests. • Observation of pest specimens to identify features used to classify them.
17.4 Control of pests.	• Describe and carry out measures used to control crop pests.	• Pest control methods. - Cultural - Physical - Chemical - Biological - Integrated pest management	• Discussion of the methods of pest control. • Demonstration of pest control methods. • Practicing pest control methods.

TOPIC 18: CROP DISEASES AND THEIR CONTROL**DURATION: 6 PERIODS****GENERAL OBJECTIVE: To enable the learner effectively control crop diseases**

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
18.1 Definition of crop disease	• Explain the meaning of the term disease	• Meaning of the term crop disease.	• Brainstorming
18. 2 Importance of diseases in crop production	• Explain the effects of plant diseases on crop production.	• Importance of diseases in crop production - Lowering quantity and quality of yield.	• Discussion of the effects of diseases on crop production. • Observation of effects of diseases on crops and products.
18. 3 General symptoms of crop diseases	• Describe the symptoms of crop diseases	• General symptoms of diseases - wilt - smuts - rusts - spots - chlorosis - streaks - rosette - mottles - mosaics - wrinkles - cankers	• Observation and description of disease symptoms on crop plants
18. 4 Classification of crop diseases	• Identify and classify crop diseases according to their casual agents.	• Classification of crop diseases - viral - bacterial - fungal	• Observation of disease symptoms to identify the causal organisms.
18. 5 Spread of crop diseases	• Describe the ways in which crop diseases are spread.	• Spread of crop diseases: - vectors - contact - wind - tools & equipment - water - planting materials - soil	• Discussion on the ways in which diseases spread .
18. 6 Control of crop diseases	• Describe and practise methods used to control crop diseases.	• Crop disease control measures - cultural - chemical - integrated	• Discussion of disease control measures • Practicing the control of diseases.

TOPIC 19:**ROOT CROPS****DURATION: 6 PERIODS****GENERAL OBJECTIVES:** To enable the learner grow root crops

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
19.1 Importance of root crops	• Explain ways in which root crops are important to us.	• Importance of root crops:- - Source of food - Source of animal feeds - Source of income - Source of raw materials for industry	• Discussion on the importance of root crops
19.2 Common root crops in Uganda	• Identify the common root crops grown in Uganda	• Common root crops:- - Cassava - Sweet potatoes - Coco yams - Irish potatoes	• Observing root crops and describing their characteristics.
19.3 Growing root crops	• Describe the stages in the growing of root crops • Grow root crops	• Growing root crops:- - Field preparation - Selection of planting materials - Planting - Spacing and seed rate - Field practices (weeding, manure/fertilizer application, pests and disease control, pruning, mulching and thinning) - Harvesting - Processing - Storage - Marketing	• Demonstration of the practices in growing root crops. • Carrying out root crop growing practices.

TOPIC 20:**FIELD CROPS****DURATION: 6 PERIODS****GENERAL OBJECTIVES:** To enable the learner grow field crops profitably

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
20.1 Importance of field crops	• Explain the ways in which field crops are important to us.	• Importance of field crops:- - Source of food - Source of animal feeds - Source of income - Source of raw materials for industry	• Discussion on the importance of keeping cattle.
20. 2 Common field crops in Uganda	• Identify common field crops grown in Uganda	• Common field crops in Uganda - Cotton - Sunflower - Tobacco - Simsim	• Observing field crops describing their characteristics
20. 3 Growing field crops	• Describe the stages in the growing of field crops • Grow field crops	• Growing field crops:- - Field preparation - Selection of planting materials - Planting - Spacing and seed rate - Field practices (weeding, manure/fertilizer application, pests and disease control, pruning, mulching thinning) - Harvesting - Processing - Storage - Marketing	• Demonstration of agronomic practices in growing field crops • Carrying out field crop growing practices

TERM III

TOPIC 21: CATTLE PRODUCTION

DURATION: 21 PERIODS

GENERAL OBJECTIVE: To enable the learner manage cattle profitably.

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
21.1 Importance of cattle keeping	Explain the ways in which cattle keeping is important to us.	- Importance of cattle keeping:- - Food - Power - Income - Hides and skins - Raw materials for industries.	Discussion on the importance of keeping cattle.
21.2 Points of a cow/bull	Identify the parts of a cow and bull	Points of a cow and bull	Observing and identifying the points on a cow/bull.
21.3 Breeds of cattle	Describe the characteristics of the different breeds of cattle.	- Breeds of cattle - Local - Exotic - Crosses	Observing different types and breeds of cattle and describing their characteristics.
21.4 Purpose of keeping cattle breeds	State the purpose for which the different breeds of cattle are kept	- Purposes of keeping the different breeds of cattle: - Dairy - Beef - Dual purposes	Discussion of the purposes for which the different breeds are kept
22.5 Reproduction in cattle	- Describe the male and female reproductive systems in cattle. - Recognize the signs of heat, pregnancy and calving in a cow. - Management of a pregnant cow.	- Reproduction in cattle: - Male reproductive system - Female reproductive system - Signs of heat in females - Process of fertilization and implantation of the embryo - Pregnancy (gestation) - Calving (parturition)	- Observation and description of specimens of the male and female reproductive systems of a cattle. - Observing cows for signs of heat and calving - Aiding a cow during calving.
21.6 Cattle improvement	- Give reasons for improving cattle. - Describe the methods of improving cattle. - Compare and contrast natural mating and artificial insemination in cattle.	- Cattle improvement - Reasons for improvement - Methods of improving cattle (selection and breeding) - Hybrid vigor - Artificial insemination	- Discussion on the reasons for improving cattle and methods of improvement. - Demonstration of artificial insemination of a cow.

21.7 The digestive system of cattle.	Describe the parts of the digestive systems and process of digestion of cattle.	- The digestive system of cattle - Parts of the digestive system of cattle - Digestion	- Observation, description and drawing of the parts of the digestive system. - Discussion on the process of digestion in cattle.
21. 8 Feeding and nutrition in Cattle.	- Explain the nutrient requirements of cattle. - Identify the various types of foodstuff given to cattle. - Outline the principles of feeding cattle. - Explain the meaning of the different terms used in animal nutrition.	- Feeding and nutrition in cattle. - Nutrients required by cattle (carbohydrates, proteins, lipids, vitamins, mineral salts) - Feedstuffs fed to cattle (water, roughages, concentrates, supplements) - Principles of feeding cattle. (time, amount, economic returns, price of feeds, availability of feeds) - Terminologies used in animal nutrition (e.g starch equivalent, production ration, maintenance ration, crude protein, supplementary feeding, dry matter, roughages, concentrates, digestibility, feeding standards)	- Discussion on the nutrient requirements of cattle. - Observation and description of various feedstuffs. - Discussion of the principles of feeding. - Explanation of the terminologies used in animal nutrition. - Feeding cattle.
21..9 Calf rearing	Describe and carry out routine practices carried out in calf rearing.	- Calf rearing - Immediate care after birth - Feeding - Dehorning - Branding - Castration - Parasite and disease control - Housing	- Farm visits to observe demonstrations of calf rearing practices. - Carrying out calf rearing practices.
21.10 Other cattle management practices	- Describe giving reasons the cattle management practices. - Carry out the cattle management practices.	- Management practices:- - Grazing management - Identification (branding, tattooing, ear notching, ear tagging, bellling) - Disease and parasite control (dipping, spraying, hand picking, pyre greasing, de-worming) - Hoof trimming	- Discussion of the cattle management practices. - Demonstration of the cattle management practices.

TOPIC 21: CATTLE PRODUCTION (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
21.11 Diseases and parasites in cattle	- Identify cattle parasites and explain their effects on cattle. - Describe the life cycles of cattle parasites. - Carry out measures to control parasites. - Describe spread, symptoms and control measures of cattle diseases. - Carry out measures to control cattle diseases.	- Meaning of the term parasite - Cattle parasites: - Endo-parasites (liver fluke, tape worms, round worms.) - Ecto - parasites (tick, lice, mites, fleas) - Cattle diseases: - Viral diseases - Bacterial diseases - Protozoan diseases Note: study in detail each of the diseases in relation to causal organism, symptoms, spread and control measures.	- Brainstorming on the meanings of parasite and disease. - Observation of specimens of parasites and describing them - Observation of cattle to identify effect of parasites on them - Discussion on the effects, life cycles, and methods of parasite control. - Practicing methods of controlling parasites. - Discussion on the spread of cattle diseases and control measures. - Observation of sick animals to identify diseases affecting them. - Practicing disease control measures.

TOPIC 22:**PERENNIAL CROPS****(Continues to Term III)****DURATION: 24 PERIODS.****GENERAL OBJECTIVE: To enable the learner acquire knowledge and skills in the production of perennial crops**

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
22.1 Coffee growing.	• Explain and demonstrate correctly the agronomic practices in the growing of coffee.	• Coffee growing - Coffee plant characteristics - Varieties (Arabica, Robusta) - Growth requirements ▪ Coffee nursery management. - Benefit of seed propagation of coffee. - Advantages and disadvantages of vegetative propagation of coffee. - Nursery management practices for seedlings and cuttings. • Agronomic/Field management practices. - Seedbed preparation - Fertilizer application - Transplanting and spacing - Provision of shade - Mulching - Weed control - Pruning - Pest and disease control - Harvesting ▪ Processing - Wet processing - Dry processing	• Demonstration on the practices used in the production of coffee. • Field visit to commercial coffee plantations and processing plants to observe agronomic practices and processing coffee. • Practical exposure on agronomic practices e.g mulching, weed control, fertilizer application, pruning.

TOPIC 22: PERENNIAL CROPS (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learners should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
22. 2 Sugar cane growing	• Identify the characteristics of a sugar cane plant. • Explain the growth requirement for sugar cane • Explain and demonstrate the agronomic practices involved in the growing of sugar cane. • Discuss processing of sugarcane.	• Sugar cane growing - Plant characteristics - Growth requirements - Land preparation ▪ Planting - Selection of planting materials - Treatment of planting materials - Methods of planting - Spacing - Fertilizer application • Other Agronomic practices - Weed control - Pest, Diseases and their control - Harvesting • Post Harvesting - Processing: product and bi-products - Marketing	• Demonstration on the agronomic practices involved in the growing of sugar cane. • Field visit to a sugar cane plantation and processing plant • Discussion of plant characteristics and growth requirements

TERM III

TOPIC 23: CROP IMPROVEMENT

DURATION: 6 PERIODS

GENERAL OBJECTIVE: To enable the learner select good planting materials for better crop yields.

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
23.1 Importance of crop improvement. 23.2 Methods of crop improvement	- Explain what is meant by crop improvement. - Explain the importance and describe the methods of crop improvement. - Carry out simple crop breeding techniques.	- Meaning of crop improvement. - Importance of crop improvement - Increased yield - Improving quality - Increasing disease and pest resistance - Improving growth rate. - Adaptation to the environment - Method of crop improvement: - Selection - Breeding (selfing /inbreeding, crossing, hybridization, open pollination to produce synthetic varieties)	- Brainstorming. - Discussion of the objectives of crop improvement. - Visits to a crop breeding centre to observe crop breeding techniques - Demonstration of simple crop breeding techniques by a resource person.

TOPIC 24:**FARM IMPLEMENTS AND EQUIPMENT****DURATION: 9 PERIODS****GENERAL OBJECTIVE:** To enable the learner correctly use and care for farm implements and equipments

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
24.1 Tillage implements	- Identify and use the various tillage implements. - Maintain tillage implements.	- Tillage implement - Primary tillage implements (tractor drawn disc and mould board ploughs and ox-ploughs) - Secondary tillage implements - Advantages and disadvantages of ox-cultivation - Conditions favouring ox-cultivation - Ox-drawn implements.	- Observation of tillage implements - Carrying out maintenance practices on tillage implements
24. 2 Planting equipment	Identify planting equipment, maintain and use them correctly	- Planting equipment - Hand pushed - Animal drawn - Tractor drawn	- Observation of planting equipments - Demonstrating the use of planting equipment. - Practicing the use of planting implements. - Carry out maintenance work on planting equipment.
24. 3 Spraying equipment	Identify, use and maintain spraying equipment	- Spraying equipment - Hand sprayer e.g knapsack - Mechanised sprayer e.g plantector	- Observation of spraying equipment to identify parts. - Demonstration of use of spraying equipment. - Practicing the use of spraying equipment. - Maintaining spraying equipment
24. 4 Harvesting equipment and machines	Identify and use correctly harvesting equipment and machines.	- Harvesting equipment and machines - Cotton picker - Ground nut lifter - Combine harvester - Potato lifter	- Observing harvesting equipment and machines. - Demonstrating use of harvesting equipment. - Practice the use of harvesting equipment.

TOPIC 24: FARM IMPLEMENTS AND EQUIPMENT (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
24. 5) Processing equipment	Identify and use processing equipment	- Processing equipment - Threshers - Winnowers - Mills - Mortar and pestle - Sieves	- Observation of harvesting equipment - Demonstration of use of processing equipment.

TOPIC 25: WORKSHOP TOOLS

DURATION: 6 PERIODS

GENERAL OBJECTIVES: To enable the learner correctly use and care for workshop tools

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
25.1 Workshop tools	Identify and use workshop tools correctly.	- Types of workshop tools and their uses - Metal work - Wood work - Building work	- Observation of workshop tools. - Demonstration of use of workshop tools. - Project work involving metal, wood work and building.
25. 2 Maintenance of workshop tools	Maintain workshop tools in good working condition.	- Maintenance of workshop tools: - Sharpening - Oiling/greasing - Replacing worn out parts - Tightening nuts - Clearing - Proper storage	- Demonstrating workshop tool maintenance practices. - Carrying out maintenance of workshop tools.

TOPIC 26: LAND TENURE**DURATION: 3 PERIODS****GENERAL OBJECTIVES:** To enable the learner appreciate the different systems of land ownership in Uganda

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
26.1 Land tenure	• Explain the different land tenure systems and state the advantages and disadvantage of each of the land tenure systems.	• Land tenure - Meaning - Land tenure systems e.g (customary/ communal freehold, leasehold, milo land) - Advantage and disadvantage of each land tenure system	• Brainstorming. • Discussion on the land tenure systems, their advantages and disadvantages.
26. 3 Land fragmentation	• Explain the causes and disadvantage of land fragmentation	• Land fragmentation - Meaning - Causes of land fragmentation - Disadvantage of land fragmentation	• Brainstorming on meaning of land fragmentation. • Discussion on causes and disadvantages of land fragmentation.
26.4 Land consolidation	• Explain the importance and measures that can be taken to consolidate land	• Land consolidation - Meaning - Importance land consolidation. - Measures to consolidate land.	• Brainstorming on meaning of land consolidation. • Discussion on the measures that can be taken to consolidate land.

TOPIC 27:**SETTLEMENTS AND RESETTLEMENT SCHEMES****DURATION: 3 PERIODS**

GENERAL OBJECTIVE: To enable the learner demonstrate an understanding of the need for settlements and re-settlement schemes, their organization and challenges.

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
27.1 Settlements and resettlement schemes	• Explain the reasons for settlements and resettlement schemes • Describe the different settlement schemes	• Settlement and resettlement schemes:- - Meaning - Reason for settling and resettling people with in a country. - Types	• Brainstorming • Discussion on reasons for resettlement and resettlement. • Discussion of settlement schemes with the aid of maps of such schemes
27. 2 Settlement and resettlement policies	• Interpret settlement and re-settlement policies	• Settlement and resettlement policies	• Discussion on policies on settlement and resettlement policies.
27. 3 Organization of settlement and re-settlement schemes	• Describe how settlement and resettlement schemes are organized.	• Organization of settlements and resettlement schemes	• Discussion on organization of settlements and resettlement.

TOPIC 28: FARMING ORGANISATIONS**DURATION: 6 PERIODS****GENERAL OBJECTIVE:** To enable the learner appreciate the importance of farming organizations in promoting agricultural production

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
28.1 Co-operatives	• Explain the importance and principles of the working of cooperatives • State the types and describe the organization of cooperatives.	• Co-operatives - Importance of farming cooperatives - Principles - Organization - Types of cooperatives.	• Discussion on the various aspects of cooperatives. • Field visit to a cooperative society to study its organization and operation in relation to farming.
28. 2 Other organizations	• Identify other organizations that relate to farming and their roles.	• Other organizations - Government extension training centres and research stations. - Farmer' organizations i.e National Farmers Federation - Commercial organizations - Farmers Clubs.	• Discussion on the roles of other organizations in farming. • Field visit to some of the organizations to study their organization and operation in relation to farming.

SENIOR FOUR TERM I

TOPIC 29: GRASSLAND MANAGEMENT

DURATION: 15 PERIODS

GENERAL OBJECTIVE: To enable the learner acquire knowledge and skills of establishing and managing grasslands for feeding livestock

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
29.1 Introduction to grassland management	- Distinguish between natural, improved and planted pastures - Explain the factors that influence the availability of pastures.	- Grasslands - Importance - Types of grasslands (natural, improved and planted pasture/ leys) - Characteristics of a good pasture plants. - Factors influencing availability of pastures.	- Brainstorming on the importance of grasslands - Guided discussion on the characteristics of natural, improved and planted pastures - Observation of the characteristics of a good pasture. - Discussion on the factors influencing of pasture.
29.2 Establishment of pure grass pastures and grass- legume mixed pastures.	- Carry out the recommended agronomic practices involved in the establishment and management of pastures. - Explain the importance of mixed pastures. - Explain the advantages of legumes in pastures.	- Establishment and management of pastures:- - Seedbed preparation - Sowing - Inoculation of legume seeds - Fertilizer application - Weed control - Pest and disease control - Irrigation - Topping/Slashing - Importance of mixed pastures compared to leys - Advantages of legumes in pastures	- Demonstrations and practicals on methods of establishing a pasture and its maintenance - Field tour to observe different types of pastures, how they are used and maintained. - Guided discussion on the importance of mixed pastures and the advantages of legumes in pastures.

TOPIC 29: GRASSLAND MANAGEMENT (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	METHODOLOGY
29. 3 Pasture improvement	• Explain and demonstrate the various practices involved in the improvement of pastures	• Operations involved in pasture improvement:- - Fencing and paddocking of grasslands. - Weed control - Introduction of improved/desirable species - Topping - Application of fertilizers and organic manures - Controlled burning of old pastures - Harrowing - Spot sowing and over-sowing pastures with legumes - Controlled grazing - Pest and disease control.	• Demonstration and practical session on the various operations performed to improve pastures. • Field visit to observe the various practicals in pasture improvement.
29. 4 Grazing management systems	• Explain the different practices used in grazing management.	• Practices in grazing management. - Set stocking/continuous grazing - Rotation grazing - Strip grazing - Zero grazing - Deferred grazing ➤ Advantage and disadvantages • Stocking rates • Carrying capacity	• Guided discussion of the systems of grazing management and their advantages. • Field visit to observe the different systems of grazing management

TOPIC 29: GRASSLAND MANAGEMENT (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
29. 5 Herbage conservation	- Distinguish between hay and silage - Describe the methods of making good quality hay and silage	- Hay - Importance - Procedure of making hay - Factors affecting quality of hay - Silage - Types of silos used - Procedure of making silage - Factors affecting quality of silage	- Observation of hay and silage to identify their characteristics - Demonstration and practical on hay and silage making.
29. 6 Important pasture species (grasses)	Identify common pasture grasses by their local and scientific names	- Pasture grasses - Elephant grass (pennisetum purpureum) - Kikuyu grass (pennisetum clandestinum) - Rhodes grass (chloris gayana) - Guinea grass (Panicum maximum) - Signal grass (Bracharia spp) - Jaragua grass (hyparrhenia rufa) - Star grass (cynodon dactylon) - Nandi grass (seteria spp)	- Observation to identify and note the characteristics of various pastures grasses. - Project to collect and preserve samples of pasture grasses.
29. 7 Important pasture legumes	Identify common pasture legumes by their local and scientific names	- Pasture legumes - Glycine (Glycine wightii) - Stylo (stylosanthes gracilis) - Green leaf desmodium (desmodium intortum) - Sliver leaf desmodium (desmodium uncinatum) - Centro (centrosome pubescens) - Lucerne (medicago sativa) - Clovers (Trifollum spp) - Siratro (Nacroptilium atropurpureum) - Lab lab (lablab spp) - For each study plant characteristics, lifespan, mode of propagation feeding value	- Observation to identify and note the characteristics of various pasture legumes. - Project to collect and preserve samples pasture grasses

TOPIC 30:**FRUIT CROPS****DURATION: 15 PERIODS****GENERAL OBJECTIVE:** To enable the learner acquire knowledge and skills of producing pineapples profitably

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
30.1 Pineapple growing	• Explain the growth requirements for pineapple. • Explain the agronomic practices and demonstrate the skills involved in the growing of pineapple.	▪ Pineapple growing - Plant characteristics - Varieties - Growth requirements ▪ Agronomic practices - Seedbed preparation - Application of fertilizers/organic manures - Planting i.e selection of planting methods, treatment of planting materials, spacing) - Mulching - Weed control - Pest and disease control - Harvesting ▪ Post harvest practices - Processing - Marketing	▪ Guided discussion on the growth requirement for pineapples ▪ Observation and identification of the characteristics of a pineapple plant. ▪ Demonstration and practicals on the agronomic practices for the growing of pineapples.

TOPIC 30: FRUIT CROPS (Contd)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
30. 2 Banana growing	- Identify the varieties and types of banana according to their use and characteristics - Explain the growth requirements for bananas - Explain and demonstrate agronomic practices involved in the planting and management of bananas.	- Banana growing - Plant characteristics - Growth requirements - Varieties of bananas e.g. cooking, beer, dessert, roasting. - Agronomic practices - Seedbed preparation - Selection and preparing suckers for planting. - Planting i.e. spacing, digging planting holes, manuring. - Field practices - Weed control - Fertilizer application - Pruning - Staking - Mulching - Pest and disease control - Growing of wind breaks - Removal of male inflorescence - Harvesting	- Observation and identification of different banana varieties and their characteristics. - Guided discussion on the growth requirement for bananas. - Demonstration and practicals on the agronomic practices used in banana production.

TERM II

TOPIC 31: FARM TRACTORS

DURATION: 18 PERIODS

GENERAL OBJECTIVES: To enable the learner understand the working of a tractor and thereby use and maintain it efficiently.

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
31.1 Introduction to farm tractors	Identify the different types of , uses and parts of tractors	- Types of tractors - wheeled tractors - crawlers - walking tractors - Uses of a farm tractor - Advantages of tractor use - Parts of a tractor	- Field visit to an institution dealing with agricultural mechanization to observe the different types of tractors and their use. - Use of videos, picture and film strips to show the types of tractors, their functioning and use.
31. 2 Tractor Engine	Describe the working of a tractor 4-stroke diesel and petrol engines.	- Types of tractor engine - Diesel engine - Petrol engine - Major parts of the tractor engine (diesel or petrol) - Working of the engine -4 stroke cycle - Differences between a petrol engine and a diesel engine.	Use of models, charts and real objects to show the difference between diesel and petrol engines and their working.

TOPIC 31: FARM TRACTOR (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
31. 3 Tractor systems	• Explain the working and maintenance of the different systems of a tractor.	• Fuel system of - Diesel engine - Petrol engine • Cooling system - Air cooling system - Water cooling system • Lubrication system - Splash feed type - Force feed type • Transmission system • Electrical system • Hydraulic system NB: For each system consider - Components - Functions - Care and maintenance practices • Nine (9) servicing points of a tractor	▪ Observation and identification of the parts of the tractor systems. ▪ Explain with the aid of charts how each system works. ▪ Demonstration and practical on the maintenance of the tractor system.

TOPIC 32: GOAT REARING

DURATION: 9 PERIODS

GENERAL OBJECTIVES: To enable the learner acquire knowledge and skills of rearing goats profitably

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
32.1 Introduction to goat rearing	Identify different types and breeds of goats by their characteristics and use.	- Goat rearing - Importance of goats - Breeds and types of goats (meat breeds e.g: mubende , samburu, Somali and Angola ; milk breeds e.g: Toggenburg , sanuen)	- Brainstorming on the importance of goats - Field visit to observe the different breeds of goats.
32. 2 Breeding in goats.	- Explain the criteria for selecting goats for breeding - Identify the signs of heat on goats	- Breeding in goats - Selection of goats for breeding - Sign of heat in a she-goat (nanny) - Timing of breeding.	- Observation of goats on heat to identify the signs of heat. - Guided discussion on the criteria used in selection of breeding goats.
32. 3 Management of goats	- Describe the care of kids after birth, their feeding, housing and weaning. - Describe the different system of grazing goats. - Design and construct a simple house for goats. - Identify and control the common parasites and diseases of goats.	- Care of kids after birth (feeding and housing; weaning) - Feeding of goats (grazing systems-herding, tethering, free range, zero-grazing; supplementary feeding of housed goats) - Housing goats - Health management - Disease; and then control. e.g food & mouth; anthrax, scours, heat water, trypanosomiasis - Parasites; ticks, intestinal worms, lice, scum, massols - Other management practices - Hoof trimming - Disbudding - Castration NB: Give the importance and procedure	Demonstration and practical on goat management practices e.g feeding, grazing, housing, disease and parasite control

TOPIC 33: SHEEP REARING**DURATION: 9 PERIODS****GENERAL OBJECTIVES:** To enable the learner acquire knowledge and skills of rearing sheep profitably

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
33. 1 Introduction to sheep rearing	Identify the breed of sheep according to their characteristics and use.	- Sheep rearing - Importance of - Breeds and types of sheep	- Brainstorming on the importance of sheep - Observation of different breeds of sheep
33. 2 Breeding in sheep	- Explain the criteria used in selection of the breeding stock for sheep - Describe the signs of heat and lambing and the management of the ewe during lambing.	- Breeding in sheep - Traits considered in selection of the ram and ewe - Signs of heat in an ewe - Lambing	- Guided discussion on the selection of breeding stock for sheep - Observation of the signs of heat in ewe and lambing in ewes
33. 3 Management of sheep	- Carryout the recommended practices used in the management of lamb and sheep - Control parasites and diseases in sheep.	- Care of the lamb after birth (feeding, housing and health management) - Weaning - Feeding (flushing in an ewe; steaming up of ewe; grazing systems) - Housing sheep - Health management <u>Diseases</u>: foot rot, lambing sickness, lamb dysentery, mastitis, FMB, contagious abortion <u>Parasites</u>: liver flukes, intestinal worms, ticks. - Other management practices - Docking - Castration - Foot trimming - Shearing/clipping	Demonstration on the skills in the care of lambs and sheep e.g feeding, housing, weaning, flushing, docking, health management; castration,, foot trimming and shearing.

TERM III

TOPIC 34: AGRICULTURAL ECONOMICS

DURATION: 12 PERIODS

GENERAL OBJECTIVES: To enable the learner acquire an understanding of the principles of economics and how they affect agricultural production

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to	CONTENT	TEACHING AND LEARNING STRATEGIES
1. 1 Principle of agricultural economics	- Explain the factors of production in relation to agricultural production - Explain the law of diminishing returns and how it affects profit maximization - Distinguish between various costs of production - Distinguish between risks and uncertainties and how they affect production. - Explain enterprise selection and combination	- Factors of production - Meaning of economics - Factors of production - Production function - The law of diminishing returns. - Profit maximization - Costs of production - Risks and uncertainties - Product combinations - Enterprise selection and combination - Efficiency standard - Specialization and diversification	- Guided discussion on factors of production. - Use of graphs and charts to illustrate the law of diminishing returns and other concepts. - Guided discussion on costs of production, risks and uncertainties, enterprise selection and combination; efficiency standards, specialization and diversification.
34. 2 Price theory	- Demonstrate the relationship between supply, demand and the price of a commodity - Explain the reason for price fluctuation of agricultural commodities and how they can be averted.	- Demand, supply and pricing - Meaning - Law of demand and supply - Prices in agriculture - Importance - Price fluctuation of agricultural products: why prices fluctuate, solutions to causes of price fluctuation.	- Use of graphs to illustrate the relationship between supply and demand. - Guided discussion on supply, demand and price

TOPIC 34: AGRICULTURAL ECONOMICS (Contd.)

SUB TOPIC	SPECIFIC OBJECTIVES The learner should be able to:	CONTENT	TEACHING AND LEARNING STRATEGIES
34. 3 Marketing of agricultural produce	Outline marketing functions and problems of agricultural marketing	- Marketing of agricultural produce - Marketing function - Problems of agricultural marketing - Marketing boards	- Guided discussion on marketing functions. - Group discussion on the problems of agriculture marketing.
34. 4 Budgeting	- Explain the importance of farm budgeting. - Distinguish between the types of budgets namely partial and complete budgets. - Follow the correct procedure in making a farm budget.	- Farm budgeting - Importance - Types - Sources of data for budgeting - Procedure of making a budget - Constraints in budgeting	Teacher guided discussion and explanation on budgeting.
34.5 Agricultural credit.	- Name the types and sources of agricultural credit. - Explain the administration of agricultural credit. - Explain the ways of making agricultural credit effective.	- Agricultural credit - Types: long term, short term, medium term, hard credits, soft credits. - Sources - Interest rates on credit and repayment policies - Ways of making agricultural credit effective.	- Guided discussion on agricultural credit its sources and administration. - Group discussion and presentation on causes, failure to pay back agriculture credit. - Guided discussion on ways of making agricultural credit effective.
34. 6 Population density and its effects on agriculture	Explain the effects of high population density on human welfare and farming.	- Population density - Meaning of - Effects of high population density on farming	Use of National Population records to explain population growth and its effects on the country's economy.

APPENDIX 1

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APPENDIX 2

RESOURCES FOR TEACHING AGRICULTURE

A. Facilities for conducting practicals include:

- A school farm
- An agriculture laboratory
- A lockable cupboard where tools, equipment and materials can be kept.
- A lockable room

B. Teaching learning tools, equipment and materials include:

1. Soil Science

- Soil samples (sands, loams, clays, sub soils, top soil, limey soil, ant hill soil, swamp soil)
- Laboratory equipments (e.g. beakers, measuring cylinders, funnels, filter papers, test tubes, capillary tubes, universal indicator solutions, PH charts, weighing scales, source of heat / bunsen burners, gas, evaporation dishes, soil sieves, litmus papers, soil augers.
- Pit sites / road sides (soil profile)
- Culture solutions
- Soil testing kit
- Farm yard manure, compost manure, green manure, organic mulches
- Artificial fertilizers (NPK, Urea SSP, CAN KCl, KN_3 , NH_4SO_4 , DAP, TSP, DSP)
- Watering can, sprinkler, hose pipe

2. Land preparation

- Slashers, hoes, rakes, pangas, axes, mowers, herbicides, ox-plough, disc plough, harrowers

3. Plant propagation

- Planting materials, grafting knife, tape, chemicals for seed dressing, polyethylene papers, rooting media, rooting hormones (IAA, IBA)

4. Crop Production

- Cereal seeds, legume seeds and other crop seeds of different varieties crops.

5. Equipments

- Ropes, tapes, dibber, secateurs, saws, wheel barrows, digging forks, manure forks, trowels, spacer , hand fork, pick axes, sickles

6. Preserved specimen of crop pests and diseases

7. Samples of diseased crop parts

8. Weeds

- Weed album, weed museum, herbicides, spraying equipment

9. Pastures

- Pasture album, pasture museum, fertilizers, inoculants, conserved pasture (hay bales and silage), molasses and urea.

10. Animal production

- Feeds (e.g. calf pellets, dairy meal, dairy cubes, maize bran, cotton seed cake, fish meal, bone meal, oyster shells, premixes, memorial licks, poultry mashes, grit, blood meal.
- Equipment (e.g. feed troughs, water drinkers, milking buckets, milk strainers, milk cans, strip cup, measuring jags, nose ring, drenching gun, burdizzo, rubber ring elastrator, trocar, canola, halter ropes, dehorning saw, hot iron rod, syringes, thermometer (clinical) rubber rings, branding iron, ear tags and ear tagger, foot trimmer, yoke chain.

11. Drugs

- Antibiotics, antiseptics, de-wormers
- Other chemicals (acaricides, insecticide, fungicides, caustic potash)

12. Spraying equipments

- Knapsack sprayer, plantector sprayer, bucket sprayer

13. Engine

- Engine block, piston, piston rings, connecting rod, valves, cranks lift, clip stick, air cleaners, radiator, fan-belt, fan engine oil, grease, carburetor, distributor sparkplugs, battery, oil filters, dynamo, alternators, injectors, injector pump.

14. Workshop tools

- Planes, spoke share, saws, hammers, mallet, pliers, pincers, files, chisels, screws, screw drivers, clamps, vices, spanners, brace, hand drill, try squares, spirit level, oil stones, oil can, greasing gun, trowels, builders, square plumb bob, ropes.

15. Building materials

- Cement, aggregate, sand, timber, iron sheets, paints, bricks, brick moulds, concrete blocks, card board blocks, marrum block, model of a building frame, nails thatching grass, reeds, papyrus

16. Fencing

- Barbed wire, plain wire, wire staples, standardized post, corner post, droppers post, wire strainer, creosote , vanish

APPENDIX 3

1.0 THE SCHOOL FARM

1.1 Purpose

A teaching and learning agricultural unit of the school and the surrounding community to:-

- Provide food items to supplement the normal school diet.
- Provide income to the school.
- Utilize school land that would be redundant.
- Provide facilities, machines, tools, implements, equipments, crops, animals and materials to be used for teaching agriculture practically.

1.2 Qualities of a Good School Farm

- Should have enough land for expansion that can accommodate many projects.
- The farm lay-out should be well planned with access roads, durable fencing, water supply and power.
- Should have well designed and durable structures for various purposes.
- Should be productive and profitable.
- Should be a good resource centre for effective teaching and learning of agriculture in the school and community around.
- Should generate funds to fund its operations.
- Should be sited in the most productive areas of the school.
- Should have a budget and plan of activities.
- Should run a separate bank account from the general school account.
- Should have a variety of well managed enterprises and projects.
- Should have well defined management policies to ensure efficient management.
- Where possible should be sited near enough to ease management and supervision.
- Should demonstrate innovations in farming that are helpful to the learner and community.

APPENDIX 4

MANAGEMENT OF THE SCHOOL FARM

A. Administrative Structure

1. Headmaster

- Oversees the activities of the farm
- Provides the necessary funding and other facilitations to ensure smooth running of school farm activities.
- Is a signatory to the farm account as the accounting officer of the school
- Ensure the security of farm property and products.
- Hires and fires school farm workers.

2. Head of Agriculture Department.

- Carries out planning of farm activities.
- Budgets, requisitions and accounts for funds provided for farm activities.
- Supervises the farm manager
- Chairs farm committee meetings.
- Is a signatory to the school farm account
- Liaises with the school administration and other departments to produce a school programme that allows for practical agricultural activities.

3. Farm Manager

- Participates in planning the activities of the farm.
- Implements the plans made.
- Supervises farm workers and ensures efficient management.
- Keeps, analyzes and uses farm records to plan profitable production.
- Ensures the welfare of farm workers
- Link the school to resource persons e.g. extension workers and veterinary staff that can be used during agricultural lessons to provide agricultural information and demonstrate farming skills.
- Demonstrating farming skills to learners and the community.

4. Assistant Farm Manager(s)

- Responsible for assigned farm projects e.g. piggery, poultry, dairy or crops.
- Supervises the workers in the farm section under his/her control.
- Does any other duties assigned by the farm manager.

B. Starting and Managing a School Farm

Starting:

- Identify a site for the proposed school farm.
- List the possible enterprises
- Design a plan for a school farm
- Select one or two enterprises to start with on a small scale to gain experience
- Budget for the chosen enterprises.
- Requisition for funds
- Construct the relevant structures
- Identify the sources of inputs.
- Recruit workers and managers
- Implement the project plan and keep farm records.
- Identify possible markets for farm products.
- Expand the projects/ enterprises when enough experience has been gained.

Managing:

1. Forming farm management committee made up of:-

- Headteacher.
- Head of Agriculture department (Chairperson).
- Agriculture teachers.
- Farm manager.
- Co-opted non-agriculture teachers.
- Student representative (i.e. Agriculture Prefect).
- Bursar.

2. Formulation of management policies by the committee to cover; - e.g.

- Defining the roles of individuals in farm management.
- Disposal of farm produce.
- Management of funds accruing from farm sales.
- Recruitment and remuneration of workers.
- Welfare of workers
- Acquisition of inputs
- Bearing of risks
- Role of the school farm as a teaching facility.

3. Approval of the management policies by the school administration and board of governors.
4. Implementations of the policies by all individuals concerned.
5. Regular review of policies to suit the prevailing circumstances.

Challenges in Managing the School Farm:

The farm management committee has the task to mitigate the following challenges:

- Unpredictable weather changes e.g. excess rain, droughts and storms.
- Unreliable rainfall.
- Outbreak of livestock disease epidemics and crop diseases.
- Shortage of land for agricultural expansion.
- Poor soils that cannot allow any profitable crop production
- Poor funding.
- Time tabling practical activities on the farm
- Insecurity of farm property.
- Poor attitude of learners, school administrators and parents towards the teaching of agriculture.
- Mismanagement of farm resources, produce and funds.
- Difficulty in marketing farm produce
- Ineffective management of learners' projects during holidays.

APPENDIX 5

ROLES OF STAKE HOLDERS

There are several stakeholders whose contribution is very vital in making the implementation of this “O” level agriculture syllabus a success. Their roles are stipulated below:-

1. Learner - active participation in

- Agriculture lesson assessment.
- Other relevant agriculture activities.
- Choosing, planning and implementing agriculture projects in and outside the school.
- Shows, exhibitions and competitions that promote agriculture.
- Setting up experiments and demonstrations on improved agricultural practices.
- Gathering relevant information and using it to promote agricultural production and productivity.
- Collection of locally available instructional materials.
- Caring for farm tools, equipment, implements and materials.
- Collecting, analyzing, keeping and using farm records.
- Routine school farm activities.
- Agriculture club activities.

2. Agriculture Teacher

- Coordinating with other subjects to ensure running of agriculture and other learning activities.
- Interpret the syllabus correctly.
- Teach the principles and practices of agriculture in a practical manner.
- Assist students in choosing, planning and implementing agricultural projects.
- Effectively demonstrate, supervise and encourage learners during practical activities and projects.
- Prepare adequate schemes of work and lesson plans.
- Plan for timely acquisition of materials and equipments for learners’ practical activities and projects.
- Organise exhibitions, shows and competition and field days for the benefit of learners and the community.
- Assess learners’ performance in theory and practicals.
- Supervise storage, proper use and maintenance of farm tools, implements and equipment in the school.
- Act as a role model to the learners and community in demonstrating that agriculture is profitable and honourable.
- Contribute actively in the development and management of the school farm.
- Set up experimental and demonstration plots.
- Give career guidance to the learners in relation to agriculture.
- Plan appropriately for agricultural activities, study tours and seminars.

3. School Administration

- Budget for and provide the necessary financial support for agricultural activities in the school.
- Timely release funds for agricultural activities in the school
- Provide land for agricultural activities.
- Giving moral and material support for agriculture programmes in the school.
- Monitor agricultural programmes in the school to ensure effective teaching.
- Recruit qualified and competent agriculture staff and supervise them.
- Support capacity building of agriculture teachers.
- Relate well with the community to support Agriculture programmes in the school.
- Assist the agriculture department in developing farm structures and projects to more efficient and productive levels for the benefit of teaching and learning and the welfare of learners.

4. Parents

- Provide opportunities for their children to practice at home the agriculture knowledge and skills they have learnt at school.
- Give financial, material and moral support to the school to enable it engage in agricultural activities.
- Participate in agricultural shows, exhibitions and field days organized by the school.

5. Board of Governors

- Formulate and monitor policies that support agricultural programmes in the school.
- Approve budgets for agricultural programmes in the school.

6. Agricultural organizations

They include farmers' organizations, agro- industries, research institutions, agricultural colleges, commercial farms and agricultural extension services.

- Demonstrate improved agricultural practices to learners and teachers.
- Provide information and resource materials relating to modern methods of farming.
- Teach learners as resource persons.
- Permit learners on study tours in their institutions.
- Integrate schools in their agricultural programmes and projects.

7. Civil Community

Including local leaders, local government and community around the school, religious organizations and NGOs,

- Avail community resources for the teaching of agriculture in school e.g fish ponds, dip tanks, breeding bulls.
- Involve agriculture teachers in community agricultural projects
- Ensure security of the school farm.
- Provide land for a school farm.
- Provide market for agricultural produce from the farm
- Provide funds and other resources to support school agricultural activities.

8. Ministry of Education and Sports

- Formulate and implement policies that support agricultural education in schools.
- Finance agriculture activities in schools.
- Train enough and competent teachers to implement agricultural programmes in schools.
- Provide an effective system of periodic monitoring and evaluation of agricultural education in schools.
- Provide appropriate teaching and learning materials for schools

