

Diploma in Agriscience and Technology (Part-Time) - A202

1. Objectives

The further development of agriculture and its related industries is challenging and requires appropriate knowledge, skills and technology concepts to keep pace with the latest technological developments in that sector. The objective of this programme is to provide professional training to practising Officers in the public and private agricultural sectors.

This programme aims to equip students with a broad spectrum of scientific, technical and managerial skills needed to meet the new challenges facing the Mauritian Agriculture.

By the end of this programme, the students will have developed knowledge and skills to:

- Acquire scientific, economic and business principles, underpinning crop and animal production
- Demonstrate relevant practical skills in key areas of agricultural production
- Identify technological problems encountered in current crop and livestock production systems
- Carry out project based work independently
- Support research, extension and other technical services in the agricultural sector
- Transfer relevant knowledge, skills and technology concepts to the producers and to support innovation

2. General Entry Requirements

In accordance with General Entry Requirements for Admission to the University for Undergraduate Degrees.

3. Programme Requirements

Two 'A' Level passes including Chemistry

Or

Alternative qualifications such as a recognised University Certificate in Agriculture or Agriculture-related field.

4. Programme Duration

| | Normal (Years) | Maximum (Years) |
|---------|----------------|-----------------|
| Diploma | 3 | 4 |

5. **Credits per Year:** Minimum 18 credits; Maximum 48 credits, subject to Regulation 4.

6. **Minimum Credits required for the Award of the Diploma: 64**

Breakdown as follows:

| | Credits from | | | |
|---------|---------------------|---------|-----------|------|
| | Core Taught Modules | Project | Electives | GEMs |
| Diploma | 58 | 6 | - | - |

Students may exit with a **Certificate** after having earned 30 credits in core modules.

7. Assessment

Each module will be assessed over 100 marks (i.e. expressed as %) with details as follows (unless otherwise specified):

Assessment will be based on a Written Examination of 2 to 3 hours duration, carrying a weighting of 70%, and Continuous Assessment carrying 30% of total marks for AGRI modules. Modules from other Faculties/Departments will carry weighting in the Written Examination and the Continuous Assessment, as specified by the concerned Faculties/Departments. Continuous Assessment will be based on laboratory/field works, and/or assignments including on-the-job assignments, and should include at least 1 class test.

An overall total of 40% for combined Continuous Assessment and Written Examination components would be required to pass a module, without minimum thresholds within the individual Continuous Assessment and Written Examination.

Modules will carry the weightings of 1 or 3 depending on their status (Introductory or Intermediate). Weighting for a particular module is indicated within parentheses in the module code.

Modules will carry credits in the range of 3 to 6. Project will carry 6 credits.

Written examinations for all the AGRI modules will be carried out at the end of the academic year.

8. Important Note

The rules as stipulated in this Programme Structure and Outline Syllabus will replace all other rules and regulations.

9. List of Modules

| Code | Module Name | Hr / Yr L+P | Credits |
|---------------|--|----------------|---------|
| COMS 1010(1) | Communication Skills | DE | 3 |
| CSE 1010e(1) | Introduction To Information Technology | OE | 3 |
| AGRI 1018Y(1) | Agricultural Chemistry and Soil Science | 45+60 | 5 |
| AGRI 1019Y(1) | Crop Science | 45+60 | 5 |
| AGRI 1020Y(1) | Biology and Control of Plant Pests, Diseases, And Weeds | 45+60 | 5 |
| AGRI 1021Y(1) | Introductory Crop Production | 45+60 | 5 |
| AGRI 1022Y(1) | Animal Science | 45+60 | 5 |
| AGRI 1023Y(1) | Animal Production | 45+60 | 5 |
| AGRI 1033Y(3) | Biochemistry I | 30+30 | 3 |
| AGRI 2024Y(3) | Agricultural Engineering and Applications | 45+45 | 4 |
| AGRI 2025Y(3) | Introductory Applied Systems, Economics, Management and Extension | 60+60 | 6 |
| AGRI 2037Y(1) | Data Handling and Statistics | 30+30 | 3 |
| AGRI 3049Y(3) | Principles of Biotechnology | 30+30 | 3 |
| AGRI 3050Y(3) | Introduction to Food Science | 30+30 | 3 |
| AGRI 2000(3) | Project | | 6 |

Total no. of credits: 64

10. Program Plan - Diploma in Agriscience and Technology (Part-Time)

YEAR 1

| Code | Module Name | Hr / Yr L+P | Credits |
|---------------|--|----------------|---------|
| COMS 1010(1) | Communication Skills | DE | 3 |
| CSE 1010e(1) | Introduction to Information Technology | OE | 3 |
| AGRI 1019Y(1) | Crop Science | 45+60 | 5 |
| AGRI 1020Y(1) | Biology and Control of Plant Pests, Diseases, and Weeds | 45+60 | 5 |
| AGRI 1022Y(1) | Animal Science | 45+60 | 5 |
| AGRI 1033Y(3) | Biochemistry I | 30+30 | 3 |

YEAR 2

| Code | Module Name | Hr / Yr L+P | Credits |
|---------------|---|----------------|---------|
| AGRI 1018Y(1) | Agricultural Chemistry and Soil Science | 45+60 | 5 |
| AGRI 1021Y(1) | Introductory Crop Production | 45+60 | 5 |
| AGRI 1023Y(1) | Animal Production | 45+60 | 5 |
| AGRI 2024Y(3) | Agricultural Engineering and Applications | 45+45 | 4 |
| AGRI 2037Y(1) | Data Handling and Statistics | 30+30 | 3 |

YEAR 3

| Code | Module Name | Hr / Yr L+P | Credits |
|---------------|--|----------------|---------|
| AGRI 2025Y(3) | Introductory Applied Systems, Economics, Management and Extension | 60+60 | 6 |
| AGRI 3049Y(3) | Principles of Biotechnology | 30+30 | 3 |
| AGRI 3050Y(3) | Introduction to Food Science | 30+30 | 3 |
| AGRI 2000(3) | Project | | 6 |

Total no. of credits : 64

11. Outline Syllabus

COMS 1010(1) - COMMUNICATION SKILLS (DE)

Theory and models of communication. Effective use of English. Written communication. Oral presentation. Communication flow in organisations. Using media.

CSE 1010e(1) - INTRODUCTION TO INFORMATION TECHNOLOGY

Information Technology and Computers; Stepping in the Computer; Input and Output Devices; Secondary Storage; Programming; Systems Software; Applications Software; Systems Development; Computer Networks; The Internet; Computer Security; Software Utilities; Issues and Trends in IT.

AGRI 1018Y(1) – AGRICULTURAL CHEMISTRY AND SOIL SCIENCE

Agrochemicals, their properties, metabolism, and mode of action. Chemistry of fertilizers: straight, complex, compound mixed, blended fertilizers. Fertiliser solutions. Foliar fertilizers. Manures, municipal sewage, compost. Chemistry of pesticides: Organochlorines, organophosphates, carbamates, pyrethroids, dinitrophenols, phthalimides, substituted ureas, triazines, inorganics, botanical pesticides, bio-pesticides. Analysis of pesticides and fertilisers.

Soil as a natural body. Weathering. Factors and processes in soil formation. Physical, physio-chemical, biological and mineralogical properties of soil. Soil profile. Soil air, water, temperature, soil organic matter and soil organisms. Concepts of soil fertility and land suitability. Soil taxonomy. Soil biology. Soil

amendments. Soil pollution. Heavy metals, Polyaromatic hydrocarbons (PAH), Persistent organic pollutants (POP) in soils. Soil bioremediation.

AGRI 1019Y(1) - CROP SCIENCE

Classification, identification, morphology, ecology and uses of economically important crops. Mendelian Inheritance. Linkage and chromosome mapping. Sex linked and extra-nuclear inheritance. Quantitative and population genetics.

Objectives of plant breeding. Selection techniques. Methods of crop improvement. Genetic variation and manipulation of variability. Breeding of selected crops. Legislative framework.

Environmental influences on crop growth and development. Vegetative and reproductive plant physiology. Plant water relations. Plant growth substances. Plant growth analysis. Yield determination and crop productivity.

AGRI 1020Y(1) - BIOLOGY AND CONTROL OF PLANT PESTS, DISEASES AND WEEDS

Taxonomy, systematic, biology, ecology and economic importance of pests, plant pathogens and weeds affecting crops. Control and management of > pests, diseases and weeds of crop plants. Concept and principles of > IPM. Biological, physical, chemical, cultural, biology-based, genetic, biotechnological and legal methods of pest control. Botanical pesticides and biopesticides. Pest-resistant transgenic crops (GMOs). > Economics of crop protection. Quarantine for plant health and biological control agents; pest-free > areas; Sanitary & phytosanitary issues; the SPS Agreement of the WTO; Pest risk assessment, surveillance and mitigation; Phytosanitary inspection, quarantine treatments and disposal of plants/produce; Standards, certification and legislation. Climate change and crop protection. GIS and Remote Sensing for crop protection.

AGRI 1021Y(1) - INTRODUCTORY CROP PRODUCTION

Principles of agronomy. Crop-environment interactions. Cropping systems. Introduction to crop propagation. Plant nutrition. Nutrient deficiency symptoms and their correction. Nutrient requirements and fertiliser recommendations for specific crops/cropping systems. Commercial fertilisers. Green manuring. Organic manures.

Field crop agronomy. Husbandry and production of economically important crops. Field operations and techniques in crop production.

AGRI 1022Y(1) - ANIMAL SCIENCE

Anatomy of non ruminant and ruminant animals digestive systems. Principles of nutritional physiology and biochemistry. Meeting nutritional objectives of farm animals. Feeds and feed evaluation. Production of compound feeds: quality assurance framework.

Avian reproductive systems and the mammary gland structure. Endocrine effects on animal products : milk production, egg production.

Muscle structure and biology. Growth and body composition. Farm animal reproductive systems (male and female). Reproductive physiology (Oestrous cycles, puberty, pregnancy and parturition. Genetic and physiological adaptation to the environment, especially in hot climate.

Principles of meat science: chemical composition. Post mortem muscle chemistry. Effects of pre and post slaughter treatments on carcass /meat quality and hygiene. Carcass appraisal.

An introduction to the basic principles of quantitative and qualitative genetics. Breeding systems of various farm animals.

Disease causing agents. Major pests and diseases of farm animals. The impact of diseases at the animal, enterprises and national and global levels. Spread and transmission of diseases. The immune system: structure and function. Natural and acquired immunity. Food borne diseases. Zoonotic diseases.

AGRI 1023Y(1) - ANIMAL PRODUCTION

Role and importance of animal production systems in agricultural enterprises: poultry, pigs, beef and dairy cattle, deer, sheep, goats rabbits, production potential of novel species. Constraints to animal productivity and production. Public concerns over animal production practices.

Fundamental stockmanship for managing farm animals: rationing; weighing and tagging; usage of preventive and diagnostic equipment; handling and restraining animals, animal's environment; evaluation of body condition score; performance records. Diagnosing farm animal abnormal behaviour. Animal housing evaluation.

AGRI 1033Y(3) – BIOCHEMISTRY I

Structure and functions of cells and organelles; Biomolecules : Polysaccharides, sugars; storage polysaccharides; lipids, classification and properties, biological membranes; proteins, amino acids, covalent and three-D structure of proteins; Enzymes, properties and mechanism of actions, enzyme kinetics; metabolic pathways, thermodynamics. Energy metabolism : pathways respiration and ATP synthesis. Photosynthesis. Nucleic acids and protein synthesis.

AGRI 2024Y(3) – AGRICULTURAL ENGINEERING AND APPLICATIONS

Basic engineering science relevant to agriculture, soil systems and water.

Soil tillage. Agricultural machinery: tractors, rotovators, mechanical planters and harvesters, and fertigators. Tractor Technology. Field mechanization. Pesticide sprayers and fertiliser applicators. Farm roads. Water logging and drainage. Precision agriculture, remote sensing, and GIS.

Irrigation systems: Equipment and operation. Soil moisture and soil moisture characteristic curves. Soil water movement. Infiltration rate. Hydraulic conductivity of soil. Nuclear methods of soil moisture determination. Irrigation systems: surface, overhead irrigation and drip Irrigation. Planning and design of various irrigation systems based on soil-water plant climate relationships. Use and maintenance of irrigation systems.

Farm structures and farm buildings. Waste management technology. Agro-meteorology. Introduction to controlled environment technology.

AGRI 2025Y(3) – INTRODUCTORY APPLIED SYSTEMS, ECONOMICS, MANAGEMENT AND EXTENSION

Introduction to agricultural systems concepts: holistic approach to agriculture; an overview of farming systems in the World with particular reference to the SADC region.

Applied Economics in Agriculture: Introducing microeconomics and macroeconomics theories.

Agriculture and Economic Development: Evolution of the Mauritian agricultural sector from beginnings to present days; challenges facing the Mauritian agricultural sector.

Agricultural management: The framework of farm management; introductory farm budgeting.

Agricultural Marketing: from commodity marketing to value-addition in agricultural products; marketing functions; marketing channels and costs.

Agricultural Extension: introductory concepts and principles; Participatory approach in agricultural research, production & extension.

AGRI 2037Y(1) – DATA HANDLING AND STATISTICS

Introducing statistics in agriculture. Descriptive statistics – displaying and summarising data. Probability distributions. Point and interval estimation. Hypothesis testing. Analysis of categorical data. Regression analysis. Data entry and analysis using EXCEL and SPSS. Introduction to scientific writing.

AGRI 3049Y(3) – PRINCIPLES OF BIOTECHNOLOGY

Concept and basis of biotechnology. Contribution by different disciplines of biology, biochemistry, microbiology, molecular biology and biochemical engineering to biotechnology. Application of biotechnology in agriculture, medicine and environmental science, fermentation technology, enzyme technology, cell and tissue culture technology.

AGRI 3050Y(3) – INTRODUCTION TO FOOD SCIENCE

Food composition; Chemistry of major food constituents. Principles of food preservation. Food processing technologies. Food microbiology: Useful microorganisms, food pathogens, food spoilage and food poisoning. Food safety and quality. Food and Health.

AGRI 2000(3) - PROJECT

This is a very important component of the programme, allowing students to develop high level skills and cognitive abilities. Every student will be allocated a research topic and the research work will be carried out under supervision. The student is required to investigate a topic/problem, plan and execute the research work as well as present and discuss the results. The student will have to submit a dissertation at the end of the final

year. Students should demonstrate good practice in using skills and knowledge acquired and follow guidelines as laid down.

15 August 2011