

BSc (Hons) Agriscience and Technology (Minor: AgriFood Marketing) – A314/12

1. Objectives

Economic development and the changing socio-economic pattern of the Mauritian society have led to an increasing demand for agricultural produce of good quality. Agricultural production is now increasingly being characterised by the use of modern technology. It is the Government policy for the future to adopt a technology-based approach to render the local agricultural sector more productive, service-oriented, sustainable and competitive whilst responding to the environmental and ethical standards demanded by society. Government is also striving to democratise economic opportunities and foster wealth creation to improve living standards of all households and all people, particularly the vulnerable ones.

The further development of agriculture and its related industries is challenging and requires appropriate knowledge, skills and technology to keep pace with the latest international technological developments in that sector. This has led to the need for well-trained agricultural scientists who have the technical and practical skills in addition to in-depth knowledge of the science to meet these new challenges facing the Mauritian agriculture. Viewed the increasing complexity of agricultural practice, there is a need for enhanced capacity in technology transfer. This programme fills that requirement.

The programme is designed to develop technology transfer and entrepreneurial skills of students in the area of agriculture and food production and marketing. The development of agro-industries will necessitate increased understanding of marketing issues which should be properly addressed. This course therefore aims at imparting the appropriate skills and knowledge of learners in AgriFood marketing.

On completion of this programme graduates will have developed knowledge and skills to:

- Explain the scientific, economic and business principles underpinning crop and animal production methods in various types of production systems;
- Identify technological problems encountered in current crop and livestock production systems;
- Provide an understanding of the principles and tools available for agribusiness management and development;
- Prepare themselves to serve in the field of Agriculture and Agribusiness in governmental, parastatal or private organisations;
- Promote their ability to serve producer groups in improving their standards of living and managing agricultural enterprises;
- Set up and operate their agricultural enterprise;
- Adopt innovative approaches to agricultural production
- Familiarise themselves with regional and global agricultural policy and strategy and its implications and regional agricultural development.
- Perform as researchers, extensionists, producers, farm managers, sales representatives and educationists.
- Develop strong analytical skills to identify strategic marketing opportunities allowing agribusinesses to gain competitive edge

2. General Entry Requirements

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

3. Programme Requirements

SC: Credit in Mathematics and Chemistry.

2 GCE 'A' Level passes in related approved Science subjects (Mathematics, Physics, Chemistry, Biology, Food Studies, Botany, Zoology, Environmental Studies, Computer Science or Computing).

4. Programme Duration

	Normal (Years)	Maximum (Years)
Degree:	3	5

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

6. **Minimum Credits Required for Award of Undergraduate Degree: 104**

Breakdown as follows:

	Credits from	
	Core Taught Modules	Project
Degree	95	9

The module Practical Training – AGRI 2000 and the module Scientific Communication – AGRI 2100 must be completed satisfactorily for the award of the degree.

Students may exit with a:

- Certificate after having earned 30 credits in core modules.
- Diploma after having earned 60 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 2-3 hour duration, carrying a weighting of 70%, and Continuous Assessment carrying 30% of total marks for AGRI modules. Continuous Assessment will be based on laboratory/field works, and/or assignments, and should include at least 1 class test. Written examinations for all AGRI modules will normally be carried out at the end of the academic year, **except for Module AGRI 3108Y(5) - Entrepreneurship for Agrifood Business, which will carry a weighting of 50% in both exam marks and Continuous Assessment.**

An overall total of 40% for combined Continuous Assessment and Written Examination 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, 3 or 5 depending on their status (Introductory, Intermediate or Advanced). Weighting for a particular module is indicated within parentheses in the module code. Each module will carry credits in the range of 3 to 6. Project – AGRI 3000Y(5) will carry 9 credits.

Assessment of the module AGRI 2000 - Practical Training will be based on the On-site Supervisor's Evaluation and the Student's Portfolio. For satisfactory completion of the Practical Training, a minimum of 40% should be attained.

Assessment of the module AGRI 2100 - Scientific Communication will be based on continuous assessment of students throughout the module and/or submission of a portfolio. The module carries no credits. For satisfactory completion of the module, a minimum of 40% should be attained.

Submission Deadlines for Dissertation:

- First Draft: by last week day of February of the Academic Year.
- Final Copy: three copies of the dissertation (2 spiral-bound copies and 1 copy on electronic storage media) by last week day of March of the Academic Year by 4.00 p.m at latest.

8. Academic Teaching in Case of an Emergency

To ensure minimal disruption of normal academic teaching in case of an emergency (eg. closure of the University for more than 2 weeks), the Moodle e-Learning Platform of VCILT will be used to deliver Teaching and Learning content. Relevant learning resources will be posted on the Platform. Assignments (if any) will be submitted using the online submission box. Arrangements will be made to register students on the Moodle platform at the beginning of the academic year.

9. List of Modules

CORE MODULES

<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u>	<u>Credits</u>
		<u>L+P</u>	
AGRI 1018Y(1)	Agricultural Chemistry and Soil Science	45+60	5
AGRI 1034Y(1)	Animal Production: Principles and Techniques	30+30	3
AGRI 1035Y(1)	Agronomy and Horticultural Crop Production I	45+60	5
AGRI 1074Y(1)	Introductory Agricultural Economics, Management and Extension	60+45	5
AGRI 1047Y(1)	Microbiology and Genetics	60+60	6
AGRI 1064Y(1)	Agrometeorology and Climate Change	45+0	3
AGRI 1071Y(1)	Data Handling and Research Methodology	30+30	3
AGRI 1073Y(1)	Botany and Plant Physiology	60+45	5
AGRI 2026Y(3)	Biotechnology	60+60	6
AGRI 2089Y(3)	Pests, Diseases and Weeds Control	45+60	5
AGRI 2092Y(3)	Animal Production and Science I	60+60	6
AGRI 2112Y(3)	Experimental Designs and Sampling Techniques	30+30	3
AGRI 2115Y(3)	Irrigation and Farm Mechanization	45+45	4
AGRI 2118Y(3)	Science and Technology of Foods	45+30	4
AGRI 2119Y(3)	Agricultural Marketing Principles	45+45	4
AGRI 2120Y(3)	Consumer Behaviour for Agrifood Products	30+30	3
AGRI 2000	Practical Training	-	-
AGRI 2100	Scientific Communication	20+0	-
AGRI 3000Y(5)	Project	-	9
AGRI 3027Y(5)	Animal Production and Health	60+45	5
AGRI 3026Y(5)	Crop Production Technologies	60+45	5
AGRI 3094Y(5)	Advanced Agricultural and Food Marketing Management	45+60	5
AGRI 3095Y(5)	Supply Chain Management and Food Retailing	45+45	4
AGRI 3096Y(5)	Marketing Research in Agrifood Sector	45+30	4
AGRI 3108Y(5)	Entrepreneurship for Agrifood Business	30+0	2
Total Number of Credits = 104			

AGRI 2000 - Practical Training can be done in either Year 1 or Year 2.

AGRI 2100 - Scientific Communication will be done in Semester 2 in Year 2.

10. Programme Plan - BSc (Hons) Agriscience and Technology (Minor: AgriFood Marketing)

YEAR 1

CORE MODULES

<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u>	<u>Credits</u>
		<u>L+P</u>	
AGRI 1018Y(1)	Agricultural Chemistry and Soil Science	45+60	5
AGRI 1034Y(1)	Animal Production: Principles and Techniques	30+30	3
AGRI 1035Y(1)	Agronomy and Horticultural Crop Production I	45+60	5
AGRI 1074Y(1)	Introductory Agricultural Economics, Management and Extension	60+45	5
AGRI 1047Y(1)	Microbiology and Genetics	60+60	6
AGRI 1064Y(1)	Agrometeorology and Climate Change	45+0	3
AGRI 1071Y(1)	Data Handling and Research Methodology	30+30	3
AGRI 1073Y(1)	Botany and Plant Physiology	60+45	5

YEAR 2

CORE MODULES

<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u>	<u>Credits</u>
		<u>L+P</u>	
AGRI 2026Y(3)	Biotechnology	60+60	6
AGRI 2089Y(3)	Pests, Diseases and Weeds Control	45+60	5
AGRI 2092Y(3)	Animal Production and Science I	60+60	6
AGRI 2112Y(3)	Experimental Designs and Sampling Techniques	30+30	3
AGRI 2115Y(3)	Irrigation and Farm Mechanization	45+45	4
AGRI 2118Y(3)	Science and Technology of Foods	45+30	4
AGRI 2119Y(3)	Agricultural Marketing Principles	45+45	4
AGRI 2120Y(3)	Consumer Behaviour for AgriFood Products	30+30	3
AGRI 2000	Practical Training	-	-
AGRI 2100	Scientific Communication	20+0	-

AGRI 2000 - Practical Training can be done in either Year 1 or Year 2.

AGRI 2100 - Scientific Communication will be done in Semester 2 in Year 2.

YEAR 3

CORE MODULES

<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u>	<u>Credits</u>
		<u>L+P</u>	
AGRI 3000Y(5)	Project	-	9
AGRI 3027Y(5)	Animal Production and Health	60+45	5
AGRI 3026Y(5)	Crop Production Technologies	60+45	5
AGRI 3094Y(5)	Advanced Agricultural and Food Marketing Management	45+60	5
AGRI 3095Y(5)	Supply Chain Management and Food Retailing	45+45	4

AGRI 3096Y(5)	Marketing Research in Agrifood Sector	45+30	4
AGRI 3108Y(5)	Entrepreneurship for Agrifood Business	30+0	2

Total Number of Credits = 104

11. Outline Syllabus

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

Agrochemicals, their properties, metabolism, and mode of action. Chemistry of fertilisers: straight, complex, compound mixed, blended fertilisers. Fertiliser solutions. Foliar fertilisers. Manures, municipal sewage, compost.

Chemistry of agrochemicals: 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 1034Y(1) - ANIMAL PRODUCTION: PRINCIPLES AND TECHNIQUES

Fundamentals of animal management and production: nutrition; feeds and feeding; reproduction and breeding; animal welfare and health; housing and equipment; animal-environment interactions.

Introduction to farm animal industries, breeds of animal, their products and by-products: matching production of quality and safe food with protection and care of the environment.

Fundamental skills of animal husbandry: rationing; weighing and tagging; usage of preventive and diagnostic equipment; evaluation of body condition score; use and development of performance records. Evaluation of Animal behaviour. Animal housing evaluation.

AGRI 1035Y(1) - AGRONOMY AND HORTICULTURAL CROP PRODUCTION I

Principles of field crop agronomy. Crop-environment interactions. Cropping systems. Crop propagation. Plant Nutrition. Nutrient deficiency symptoms and their corrections. Nutrient requirements and fertiliser recommendations for specific crops / cropping systems.

Applied crop physiology. Husbandry and production of economically important horticultural crops. Field operations and techniques in crop production. Organic production systems.

AGRI 1074Y(1) - INTRODUCTORY AGRICULTURAL ECONOMICS, MANAGEMENT AND EXTENSION

Agricultural economics: demand and supply; principles of production economics; Neoclassical Theory of Farm Production; Management Concepts and Framework of Management. Farm and Agribusiness Planning. Risk and Uncertainty in Agriculture. Agricultural and food policies. Structure and organisation of local agricultural institutions. Regional Trade. Introduction to agricultural extension. Agricultural extension: principles, programmes and management; Participatory Research Approach. Farming Systems Research.

AGRI 1047Y(1) - MICROBIOLOGY AND GENETICS

Microbiology diversity, structure, functions and economic significance. Microbial physiology. Growth and Survival. Control of microorganisms. Basic procedures and techniques in microbiological analysis.

Mendelian Inheritance. Linkage and chromosome mapping. Sex linked and extra-nuclear inheritance. Quantitative and population genetics. Objectives of plant breeding. Selection techniques. Breeding of selected crops. Legislative framework. Methods of crop improvement. Genetic variation and manipulation of variability.

AGRI 1064Y (1) - AGROMETEOROLOGY AND CLIMATE CHANGE

Economic significance and importance of weather. Radiation and surface energy balance: earth's atmosphere; atmospheric energy; atmospheric moisture and precipitation; atmospheric motion. Soil and its heat balance. Topoclimate and mesoclimate, representative observation, and their dependence on topography. Agrometeorology management at microscale and topocscale.

Global climatic change and variability and its effect on agriculture: weather hazards affecting agricultural output. Weather patterns over Mauritius. Use of weather data in agriculture. Basic instrumentation in agrometeorology. Seminar-based learning. Problem-solving and case studies on climate change mitigation and adaptation.

AGRI 1071Y(1) - DATA HANDLING AND RESEARCH METHODOLOGY

Introducing statistics. Levels of measurements. Collection, organisation and presentation of numerical data. Averages and measures of variation and skewness. Probability distributions. Point and interval estimation. Hypothesis testing. Analysis of categorical data. Correlation and Regression Analysis. Introduction to research methodology. Elements of scientific and technical writing. Data entry and analysis using EXCEL and MINITAB.

AGRI 1073 Y(1) - BOTANY AND PLANT PHYSIOLOGY

Classification, identification, morphology, ecology and uses of economically important crops. Plant Biodiversity. Environmental influences on crop growth and development. Vegetative and reproductive growth. Plant water relationships. Plant growth substances. Growth kinetics. Plant growth analysis. Yield determination and crop productivity. Seed physiology. Light and plant development: photomorphogenesis and photoperiodism. Source-sink relationship. Photosynthate partitioning in relation to yield. Senescence. Water and plant mineral uptake. Problem-solving and case-studies. Stress physiology.

AGRI 2026Y(3) - BIOTECHNOLOGY

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. Glycolysis.

Organisation of genetic material, gene structure, expression and transmission. Control of gene expression. Structure and properties of DNA. DNA replication. Protein synthesis. Principles of gene cloning. Recombinant DNA technology.

Concept and basis of biotechnology. Tissue culture techniques and applications. Application of biotechnology in agriculture and crop improvement.

AGRI 2089Y(3) - PESTS, DISEASES AND WEEDS CONTROL

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 2092Y(3) - ANIMAL PRODUCTION AND SCIENCE 1

Aspects of physiological processes in growth and development, digestion, reproduction, lactation, egg laying. Meat science: carcass composition and quality, pre and post mortem muscle metabolism. Key concepts in thermal balances in farm animals. Livestock and climate change: impacts on grasslands, biodiversity, health.

Digestive physiology and metabolism of end products of digestion. Factors regulating feed intake. Feed evaluation. Feeding standards and their applications. Feed formulation: manual and computerised procedures. Legislative framework for feed manufacture.

Basic principles of qualitative and quantitative genetics. Main selection methods and genetic responses. Concepts of correlated selection response, heterosis and crossbreeding system.

Natural and acquired immunity. Disease causing agents. Major pests and diseases of farm animals and their control. Veterinary Public health and food borne and zoonotic diseases. Disease surveillance and Animal health schemes.

AGRI 2112Y(3) - EXPERIMENTAL DESIGNS AND SAMPLING TECHNIQUES

Design and analysis of experiments. Analysis of variance. Completely randomized design, Randomized block design, Latin square design. Factorial treatment structure. Non-parametric methods. Data entry, analysis and interpretation using EXCEL and MINITAB. Qualitative and quantitative research. Sampling methods. Questionnaire development, design and administration. Data coding and processing using SPSS.

AGRI 2115Y(3) - IRRIGATION AND FARM MECHANIZATION

Basic engineering science relevant to agriculture, soil and water. Soil-water-plant relationships. Soil water movement: Infiltration. Evapotranspiration. Crop water requirements and irrigation scheduling. Irrigation Methods: surface, overhead and subsurface Irrigation. Measurement of Irrigation Water. Water Conservation and Rainwater Harvesting. Agricultural machinery: tractors, tillage implements, mechanical planters and harvesters, rotovators, pesticide sprayers, and fertilizer applicators. Tractor Technology. Farm structures and buildings. Farm roads. Handling and disposal of farm wastes.

AGRI 2118Y(3) - SCIENCE AND TECHNOLOGY OF FOODS

Classification, chemical structure and properties and nutritional value of food commodities. Primary sensory attributes of foods and perception of food quality. Methods for Proximate analysis of foods.

Microbial food spoilage. Useful micro-organisms. Incidence and causes of major food borne microbial diseases. Types of nutrients and their role in the human body. Healthy eating guidelines sustainable diet. Food safety concept from farm to table. Post harvest losses and Postharvest loss reduction technology. Processing of foods of plant and animal origin.

AGRI 2119Y(3) - AGRICULTURAL MARKETING PRINCIPLES

Definitions of Food and Agricultural Marketing; Marketing concept; Marketing Environment; Commodity marketing to value-addition in agricultural products; Marketing functions; Marketing channels and costs; Trends in Consumer Behaviour in Food Sector; Segmentation, Targeting and Positioning; The marketing mix - 4Ps.

AGRI 2120Y(3) - CONSUMER BEHAVIOUR FOR AGRIFOOD PRODUCTS

The importance of understanding customer needs in the agrifood sector; Theories from Psychology, Sociology and Economics to understand consumer behavior; The Stages of the buying process; Participants in the buying process; Motivation research applied to agrifood marketing; Behaviour choice theory. Environmental forces in buying decisions.

AGRI 2100 - SCIENTIFIC COMMUNICATION SKILLS

Avenues of communication in science. Scientific and technical writing. Oral and poster presentations. Ethics of scientific publishing. The dissertation guidelines. Planning and managing the dissertation writing up process – effective literature search and review, introduction, methodology, results, discussion, conclusions, referencing rules and plagiarism.

AGRI 2000 - PRACTICAL TRAINING

Students are required to undergo a full-time practical training of 6-8 week duration during the winter vacation, either in year 1 or in year 2. The practical training placement may take place in the various agricultural institutions and industries in the private or public sector. The aim is to contextualise learning within real-life work environments related to your course. Students are required to submit a training placement portfolio. This module does not carry any credit, but training must be completed satisfactorily for the award of the degree.

AGRI 3000Y(5) - PROJECT

Every student will be allocated a research topic related to agrifood marketing. The research work will be carried out under academic supervision. Students should demonstrate good practice in using skills and knowledge acquired during the programme and follow dissertation guidelines as laid down by the Faculty of Agriculture.

AGRI 3027Y(5) - ANIMAL PRODUCTION AND HEALTH

Principles of managing animals in typical production systems for biological and economic sustainability: poultry, pigs; rabbits; deer; goats and sheep; beef and dairy cows and novel species. Best management practices for their efficient and profitable production: nutrition, reproduction and fertility, housing and equipment, waste management technologies.

Food chain management from primary production to consumer use. Trends and current issues related to production and consumption of animal products: meeting the needs of a global market and public concerns.

Prevention and control of farm animal disease. Management of disease risks. Principles of vaccination. Classification and mode of action of the major classes of drugs. Use and control of drugs. Disease control using non chemical methods. Animal health management schemes for various farm animals.

Animal welfare concepts and definition (eg; the five freedom). Specific requirements for the welfare of named ruminants and non-ruminants. Methods for assessing animal welfare status.

AGRI 3026Y(5) - CROP PRODUCTION TECHNOLOGIES

Mechanised vegetable crop production. Plant characteristics for mechanised crop production. Soil conditioning for vegetable production. Seed priming and enhancement. Fluid drilling. Direct sowing for crop establishment. Plug production. Mechanical transplanting. Plastic mulching in horticulture. New trends in vegetable crop production. Good agricultural practices in crop production. Tissue Culture technologies for crop improvement. Fruit production technologies.

Cropping and production of high value horticultural crops in plastic tunnels, shade houses and greenhouses. Types of structures for protected cultivation and their characteristics. Greenhouse design and site considerations. Greenhouses and their operation.

Plant culture in hydroponics. Plant nutrition in Soilless Culture. Hydroponics media. Hydroponics systems. Cropping and production of selected vegetables, fruits and ornamentals in soilless culture systems: water culture systems and substrate culture systems. Hydroponics waste management. Aeroponics.

AGRI 3094Y(5) - ADVANCED AGRICULTURAL AND FOOD MARKETING MANAGEMENT

Nature and Scope of Agrifood Marketing; Marketing strategy, Planning & Control; New product Development; Commodity marketing; Marketing Mix: Product management, branding, packaging; Pricing decisions; Channel management and physical distribution; Analysis of agrifood chain, conflicts in distribution channels, Setting up a National Wholesale market; Technological advances in physical distribution; Marketing communication, promotional mix; Contract farming.

AGRI 3095Y(5) - SUPPLY CHAIN MANAGEMENT AND FOOD RETAILING

The agro-industrial supply chain management; scope and structure of food supply; Understanding and analysis of agrifood chain; food and society; functions of supply chain; success factors for supply chain management; practices of supply chain management in agrifood sector – linking farmers and processors. Agricultural value chain financing. Introduction to Food Retailing; Changes in Food retailing; Internationalization of food retailing.

AGRI 3096Y(5) - MARKETING RESEARCH IN AGRIFOOD SECTOR

The role of marketing research in managerial decision making in agrifood sector, the marketing research process: research proposal, problem formulation, research design, qualitative v/s quantitative research, exploratory research, descriptive research, causal research, primary v/s secondary data, literature review, case studies, focus groups, depth interviews, projective techniques in marketing research, observation techniques, experiments and test markets, questionnaire design, attitude scale measurements, survey methods, sampling theory, marketing research report and presentation. Marketing Research and Marketing Information Systems in the AgriFood Sector.

AGRI 3108Y(5) - ENTREPRENEURSHIP FOR AGRIFOOD BUSINESS

Understanding concepts of entrepreneurship; the entrepreneurial attitude; Creativity techniques, Innovation and Entrepreneurship; the entrepreneurial process; Socio-Economic importance of Entrepreneurship and SME's in agribusiness; the agrifood business environment analysis; Financing a small business-equity financing, loan and agribusiness equipment leasing; challenges for setting up of agribusiness; the family business reasons for success and failure; Business Support in Mauritius-financial and non financial; Setting up a business, the procedural and legal implications in sole proprietorships, private companies, agricultural cooperatives and franchises; The Business Plan-structure and contents; Case studies and Skills Workshops on selected themes.

