

## **MSc Food Technology – A516 (Subject to Approval)**

### **1. Objectives**

This programme is designed to develop the necessary competence for a career in the agri-food sector. Graduates will also be equipped to enter other food-related sectors such as food laboratories and research institutions. Teaching and learning will impart knowledge, skills and values to develop employability and produce lifelong learners who can think and act creatively. Teaching methods will strengthen in-depth, reflective and integrative learning.

Upon completion of this programme, learners will be able to:

- apply scientific principles to develop strategies to control the changes in chemical, physical, microbiological, nutritional and sensory properties of food during manufacture and storage;
- apply analytical methods to assess quality, nutritive value, safety and compliance with food standards;
- discuss the role of food components in health maintenance and disease prevention.
- participate in the development, implementation and maintenance of comprehensive food safety management systems to protect consumer health;
- specify raw food materials characteristics in relation to processing methods;
- apply methods of preservation and processing to control spoilage mechanisms in foods and to produce safe foods;
- describe underlying engineering principles of food processing operations, relate process variables to food quality indicators and monitor these variables to attain end-product specifications;
- apply problem-solving skills and competencies in their work environment;
- demonstrate good oral and written communications skills, ability to work effectively both independently and in a team, and good knowledge of work and human values;
- generate innovative ideas to inspire the development and growth of small and medium food enterprises, and food industries;
- add value to the activities of food organisations to meet customer, regulatory and relevant requirements; and
- prepare their continuing professional development plan towards lifelong learning.

### **2. General Entry Requirements**

Successful completion of an undergraduate degree with

- at least a Second Class or 50%, whichever is applicable or
- a GPA not less than 2.5 out of 4 or equivalent, from a recognised higher education institution

**OR** alternative qualifications acceptable to the University of Mauritius

**3. Programme Requirements**

A Degree in Life Sciences or related fields.

**4. General and Programme Requirements – Special Cases**

The following may be deemed to have satisfied the General and Programme requirements for admission:

- (i) Applicants who do not satisfy any of the requirements as per Regulations 2 and 3 above but submit satisfactory evidence of having passed examinations which are deemed by the Senate to be equivalent to any of those listed.
- (ii) Applicants who do not satisfy any of the requirements as per Regulations 2 and 3 above but who in the opinion of Senate, submit satisfactory evidence of the capacity and attainments requisite to enable them to pursue the programme proposed.

**5. Programme Duration**

	<b>Normal [Year(s)]</b>	<b>Maximum [Years]</b>
Master’s Degree (FT):	1	2
Master’s Degree (PT):	2	4
Postgraduate Diploma (FT):	1	2
Postgraduate Diploma (PT):	2	4

- 6. Credits per Semester (FT):** Minimum 12 credits subject to Regulation 5.  
**Credits per Year (PT):** Minimum 12 credits subject to Regulation 5.

**7. Minimum Credits Required for the Award of**

Master’s Degree: 36  
Postgraduate Diploma: 24

Breakdown as follows:

	<b>Core Taught Modules</b>	<b>Project</b>
Master’s Degree:	27 credits	9 credits

Full time Practical Training must be completed satisfactorily for the award of the degree.

## 8. Assessment

Each taught module will carry 100 marks and will be assessed as follows (unless otherwise specified):

Assessment will be based on written examination of 2 to 3 hour duration carrying a weighting of 70%, and continuous assessment carrying 30% of total marks. Continuous assessment will be based on practical classes in and outside the laboratory, case studies, problem-based learning, visits, student-led seminars, literature-based research and/or assignments, **and shall include at least 1 class test.**

For a student to pass a module, a minimum of 30% should be attained in both the Continuous Assessment and Written Examination, with an overall total of a minimum of 40% in that module.

Written examinations for all the modules, whether taught over one semester or one academic year, will be carried out at the end of the academic year.

Assessment of practical training will be based on the on-site supervisor's evaluation and the student's placement portfolio. For satisfactory completion of the practical training, a minimum of 50% should be attained.

### **Submission Deadlines for Dissertation:**

- First Draft: End of July in the Final year.
- Final Copy: Last working day of August in the Final year.

## 9. Important Note

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

## 10. List of modules

<b>Code</b>	<b>Module Name</b>	<b>Hrs/Yr L+P</b>	<b>Credits</b>
<b><u>CORE MODULES</u></b>			
AGRI 6000Y(1)	Project	-	9
AGRI 6017Y(1)	Principles of Management & Marketing applied to Food Enterprise/Industry	30+30	3
AGRI 6040Y(1)	Food Chemistry and Analysis	45+45	4
AGRI 6041Y(1)	Human Nutrition and Food Microbiology	45+30	4
AGRI 60XXY(1)	Food Processing	30+45	3
AGRI 6043Y(1)	Fundamentals of Food Process Engineering	30+30	3
AGRI 6044Y(1)	Food Process Engineering	30+30	3
AGRI 60XXY(1)	Food Quality and Safety	45+30	4
AGRI 6046Y(1)	Research Methods and Experimentation for Food Technologists	30+45	3
AGRI 6010	Practical training (3-4 weeks)		

**11. Programme Plan – MSc Food Technology**

**Full-Time:**

<b>YEAR 1</b>			
<b>Code</b>	<b>Module Name</b>	<b>Hrs/Yr L+P</b>	<b>Credits</b>
<b><u>CORE MODULES</u></b>			
AGRI 6000Y(1)	Project	-	9
AGRI 6017Y(1)	Principles of Management & Marketing applied to Food Enterprise/Industry	30+30	3
AGRI 6040Y(1)	Food Chemistry and Analysis	45+45	4
AGRI 6041Y(1)	Human Nutrition and Food Microbiology	45+30	4
AGRI 60XXY(1)	Food Processing	30+45	3
AGRI 6043Y(1)	Fundamentals of Food Process Engineering	30+30	3
AGRI 6044Y(1)	Food Process Engineering	30+30	3
AGRI 60XXY(1)	Food Quality and Safety	45+30	4
AGRI 6046Y(1)	Research Methods and Experimentation for Food Technologists	30+45	3
AGRI 6010	Practical training (3-4 weeks)		

**Part-Time:**

<b>YEAR 1</b>			
<b>Code</b>	<b>Module Name</b>	<b>Hrs/Yr L+P</b>	<b>Credits</b>
<b><u>CORE MODULES</u></b>			
AGRI 6040Y(1)	Food Chemistry and Analysis	45+45	4
AGRI 6041Y(1)	Human Nutrition and Food Microbiology	45+30	4
AGRI 6043Y(1)	Fundamentals of Food Process Engineering	30+30	3
AGRI 6046Y(1)	Research Methods and Experimentation for Food Technologists	30+45	3
AGRI 6010	Practical training (3-4 weeks)		

<b>YEAR 2</b>			
<b>Code</b>	<b>Module Name</b>	<b>Hrs/Yr L+P</b>	<b>Credits</b>
<b><u>CORE MODULES</u></b>			
AGRI 6000Y(1)	Project	-	9
AGRI 6017Y(1)	Principles of Management & Marketing applied to Food Enterprise/Industry	30+30	3
AGRI 60XXY(1)	Food Processing	30+45	3
AGRI 6044Y(1)	Food Process Engineering	30+30	3
AGRI 60XXY(1)	Food Quality and Safety	45+30	4

**Total: 36 credits**

## 12. Outline Syllabus

### CORE MODULES

#### **AGRI 6000Y(1) – PROJECT**

The project provides an opportunity for students to undertake and contribute to a piece of original research work in an area related to food technology, and may include the design and development of a new food product. The project may be industry-based and may address a specific research problem in the food industry. Students are required to design an experiment (or investigation, survey or other means) to test a hypothesis or proposition, to plan and execute the research work, to evaluate the outcomes and draw valid conclusions.

The project work is to start at the end of the first semester of year 1 (for full-time students) or at the beginning of the first semester of year 2 (for part-time students). It is carried out individually under guided supervision. To support the project work, the Faculty has prepared a document which provides project guidelines for MSc degree.

#### **AGRI 6017Y(1) – PRINCIPLES OF MANAGEMENT AND MARKETING APPLIED TO FOOD ENTERPRISE / INDUSTRY**

Fundamentals of management applied to food enterprise/industry. Entrepreneurship and setting up of small/medium food enterprises. Fundamentals of agricultural and food marketing. Value-addition in the food industry. Marketing research for new product development. Business plan development for a small/medium food enterprise. Organization of research and the technology innovation process.

#### **AGRI 6040Y(1) - FOOD CHEMISTRY AND ANALYSIS**

Classification, chemical structure and properties of major food constituents (water, proteins, lipids, carbohydrates) and minor food constituents (vitamins, minerals, and pigments). Chemical composition and properties of food commodities (milk, meat, seafoods, poultry, eggs, fats, wheat, fruits and vegetables). Classification, chemical structure, properties and applications of food additives. Safety evaluation of food additives. Relevance and significance of the properties of food constituents and food additives for food quality and safety. Developments in food ingredients for improved chemical, biological and functional properties. Primary sensory attributes of foods and perception of food quality.

Qualitative and quantitative methods of food analysis. Control of factors which affect the reliability of analyses. Good Laboratory Practices and quality standards for food laboratories. Sampling plans and methods. Sample preparation. Validated and standard methods of food analysis. Application of physical, chemical, biochemical, immunological, instrumental and sensory methods to determine nutritive value, quality, safety and compliance with food standards. Analysis of selected foods. Structure and content of scientific reports. Recent developments in methods of food analysis including food authentication, detection of Genetically Modified foods and allergens.

#### **AGRI 6041Y(1) - HUMAN NUTRITION AND FOOD MICROBIOLOGY**

Nutritional value of foods. Utilisation of nutrients by the human body. Dietary guidelines and balanced diet. Diet-related diseases. Food sensitivity and intolerances. Effect of processing on nutrients. Functional foods and emergence of the “food-drug interface” concept.

Morphology, structure and function of bacteria, moulds, yeasts and viruses. Factors affecting microbial growth. Microbial food spoilage. Useful micro-organisms. Incidence and causes of

food-borne disease. Characteristics of major food-borne disease micro-organisms. Emerging pathogens. Microbiological criteria for foods. Microbiological examination of foods. New methods and technologies in the detection of micro-organisms.

**AGRI 60XXY(1) - FOOD PROCESSING**

Food preservation by heating, chilling, freezing, dehydration and chemicals. Alternatives to heat processing including ionising radiation, microwave and high pressure processing. Raw materials specifications. Process control and validation of critical process parameters. Food packaging. Manufacture and storage of seafood, animal and plant food products.

**AGRI 6043Y(1) - FUNDAMENTALS OF FOOD PROCESS ENGINEERING**

Engineering principles of food processing operations: Units, Dimensions and System conversions; Thermodynamics; Material, Energy and Momentum balance; Solid and Fluid rheology; Fluid flow.

**AGRI 6044Y(1) - FOOD PROCESS ENGINEERING**

Heat and mass transfer. Heat exchangers. Engineering principles behind selected unit operations used in food processing including refrigeration, freezing, evaporation, dehydration, comminution.

**AGRI 60XXY(1) - FOOD QUALITY AND SAFETY**

Concepts of food quality and safety. Factors which affect food quality and safety. National and International food laws and standards. National food control systems. Importance of food safety management throughout the food chain. Food safety hazards: primary sources, characteristics, adverse health effects, implicated foods and control measures. Risk analysis. Comprehensive food safety management systems. Pre-requisite Programmes (PRPs). Codex general principles of food hygiene. Codex guidelines for the Hazard Analysis Critical Control Point (HACCP) system. Application of the seven HACCP principles to selected food processing operations. HACCP experience of food industries. Principles of quality management. ISO 9001 quality management system standard. ISO 22000 food safety management system standard. Relationship between quality, environment and food safety management.

**AGRI 6046Y (1) - RESEARCH METHODS AND EXPERIMENTATION FOR FOOD TECHNOLOGISTS**

Elements of research methodology. The research process. Review of basic statistical methods. Design and analysis of experiments. Sampling techniques. Questionnaire development, design and administration. Data entry and analysis using MINITAB and SPSS. Inherent and assignable causes of process variation. Development and application of variable and attribute Shewart control charts in food industries. Operation of Codex sampling plans.

**AGRI 6010 - PRACTICAL TRAINING (3-4 WEEKS)**

Students are required to undergo a full-time practical training of 3-4 week duration after year 1 examinations, during the winter vacation (for part-time students) or after semester 1 of year 1, during the summer vacation (for full-time students). The training placement may take place in food industries/research institutions/private or public food laboratories. The aim is to contextualise learning within real-life work environments related to food technology. 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.