

BSc (Hons) Agriculture (Specialisation: Aquaculture) - A318 (Under Review)

1. Objectives

Aquaculture or “aquatic agriculture” is the world’s fastest growing food production sector, increasing by 10% per annum over the past decade. Aquaculture is the farming of aquatic animals and plants, including fish, molluscs, crustaceans, corals, amphibians, reptiles and algae. It is a multidisciplinary subject, encompassing areas in animal biology and culture, ecology, oceanography and chemistry.

This programme aims to equip students with a broad spectrum of scientific, technical, managerial and business skills needed to contribute to the development and enhancement of agriculture, particularly aquaculture, in Mauritius. It is in line with Government policy and vision for agricultural diversification, in particular the development of a Seafood Hub for the region. Mauritius has an Exclusive Economic Zone of 1.9 million km², which has the potential to contribute immensely to the national economy.

The scheme of study will also enable successful candidates to pursue higher studies at postgraduate level in specialist aspects of aquaculture.

By the end 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 terrestrial production systems.
- Explain the scientific, economic and business principles underpinning various aquaculture technologies.
- Identify and evaluate appropriate aquaculture technologies.
- Design, plan and carry out research in the field of aquaculture.
- Evaluate the wider consequences of aquaculture activities and promote responsible aquaculture practices.
- Transfer relevant knowledge, skills and technology concepts to producers, and to promote innovation, in the field of aquaculture.

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, Computer Science or Computing).

Preference will be given to candidates holding an 'A' Level in Chemistry, Mathematics, Biology or Physics.

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 the Award of Undergraduate Degree: 111

Breakdown as follows:

	Credits from			
	Core Taught Modules	Project	Electives	GEM
Degree	93	9	3	6

Practical Training and the Scientific Communication module must be completed satisfactorily for the award of the degree.

Students may exit with

- (a) a Certificate after having earned 30 credits in core modules.
- (b) a 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. Modules from other Faculties/Departments/Centres will carry weighting in the Written Examination and the Continuous Assessment as specified by the concerned Faculties/Departments/Centres. Continuous Assessment will be based on laboratory/field works, and/or assignments, and should include at least 1 class test.

An overall total of 40% for combined Continuous Assessment and Written Examination is required to pass a module.

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 3 to 6 credits. Project will carry 9 credits.

Assessment of practical training will be based on supervisor's report and student's report. For satisfactory completion of the practical training, a minimum of 40% should be attained. The practical training will be offered either at the end of year 1 or at the end of year 2, depending on placement opportunities.

Assessment of the Scientific Communication module will be based on continuous assessment of students throughout the module and/or submission of a portfolio. For satisfactory completion of the module, a minimum of 40% should be attained.

Written examinations for all the modules will be carried out at the end of the 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

CORE MODULES

<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u> <u>L+P</u>	<u>Credits</u>
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 1022Y(1)	Animal Science	45+60	5
AGRI 1023Y(1)	Animal Production	45+60	5
AGRI 1035Y(1)	Agronomy & Horticultural Production I	45+60	5
AGRI 2001Y (3)	Food Science and Technology	60+60	6
AGRI 2024Y (3)	Agricultural Engineering and Applications	45+45	4
AGRI 2025Y (3)	Introductory Applied Systems, Economics, Management and Extension	60+60	6
AGRI 2026Y(3)	Biotechnology	60+60	6
AGRI 2033Y(5)	Freshwater and Coastal Ecology	60+45	5
AGRI 2045Y (3)	Statistical Methods for Agricultural Sciences	45+45	4
AGRI 2079Y(5)	Water Quality and Management	60+45	5
AGRI 3042Y (5)	Marine Aquaculture & Technology	60+ 60	6
AGRI 3043Y (5)	Aquaculture Products, Entrepreneurship, & Small Business Management	60+ 60	6
AGRI 3070Y (5)	Freshwater Aquaculture & Technology	60+ 60	6
AGRI 3074Y (5)	Seafood Hub Activities & Technology	45+ 0	3
AGRI 3000Y (5)	Project	-	9
AGRI 3100	Scientific Communication	20 + 20	

ELECTIVES (Choose One from)

<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u> <u>L+P</u>	<u>Credits</u>
AGRI 3045Y (5)	Sustainable Fisheries Management	30+ 30	3
AGRI 3075Y (5)	Oceanography	30+ 30	3
GEM (1)	1 module	-	6

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

AGRI 3100 – Scientific Communication will be done in Semester 1 in Year 3.

Total no. of credits : 111

10. Program Plan - BSc (Hons) Agriculture with Specialisation in Aquaculture

CORE MODULES

YEAR 1			
<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u> L+P	<u>Credits</u>
CORE			
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 1022Y(1)	Animal Science	45+60	5
AGRI 1023Y(1)	Animal Production	45+60	5
AGRI 1035Y(1)	Agronomy & Horticultural Production I	45+60	5
YEAR 2			
<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u>	
<u>Credits</u>		L+P	
CORE			
AGRI 2001Y (3)	Food Science and Technology	60+60	6
AGRI 2024Y (3)	Agricultural Engineering and Applications	45+45	4
AGRI 2025Y (3)	Introductory Applied Systems, Economics, Management and Extension	60+60	6
AGRI 2026Y(3)	Biotechnology	60+60	6
AGRI 2033Y(5)	Freshwater and Coastal Ecology	60+45	5
AGRI 2045Y (3)	Statistical Methods for Agricultural Sciences	45+45	4
AGRI 2079Y(5)	Water Quality and Management	60+45	5
YEAR 3			
<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u>	
<u>Credits</u>		L+P	
CORE			
AGRI 3042Y (5)	Marine Aquaculture & Technology	60+ 60	6
AGRI 3043Y (5)	Aquaculture Products, Entrepreneurship, & Small Business Management	60+ 60	6
AGRI 3070Y (5)	Freshwater Aquaculture & Technology	60+ 60	6
AGRI 3074Y (5)	Seafood Hub Activities & Technology	45+ 0	3
AGRI 3000Y (5)	Project	-	9
<u>ELECTIVES (Choose One from)</u>			
<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u> L+P	<u>Credits</u>
AGRI 3045Y (5)	Sustainable Fisheries Management	30+ 30	3
AGRI 3075Y (5)	Oceanography	30+ 30	3
GEM (1)	1 module	-	6

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

AGRI 3100 – Scientific Communication will be done in Semester 1 in Year 3.

Total no. of credits : 111

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 (OE)

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 & 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. New sources of soil amendments : seaweed, raw and transformed wastes from various sources, minerals, etc.

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 & WEEDS

Taxonomy, systematics, 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 and biology-based, genetic, biotechnological and legal methods of pest control. Economics of crop protection. Economics of crop protection. Botanical pesticides and biopesticides. Pest-resistant transgenic crops (GMOs). 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 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 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.

AGRI 2001Y(3) - FOOD SCIENCE AND TECHNOLOGY

Classification, chemical structure and properties of food constituents and food additives. Chemical composition, properties and nutritional value of food commodities. Primary sensory attributes of foods and perception of food quality. Microbial food spoilage. Useful micro-organisms. Incidence and causes of food borne disease. Characteristics of major food-borne disease micro-organisms. Physical, chemical, sensory and microbiological analysis of foods. Types of nutrients and their role in the human body. Planning a balanced diet.

Food laws and standards. Concepts of food quality and safety. Factors which affect quality and safety. Food hazards. Food preservation by heating, chilling, freezing, dehydration, chemicals and ionizing radiation. Packaging materials. Processing of selected food products. Process control, application of principles of food hygiene and relevant codes of practice/guidelines to ensure quality and safety. Traceability. Importance of food safety management throughout the food chain. Comprehensive food safety management systems.

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 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 2033Y(5) - FRESHWATER AND COASTAL ECOLOGY

Characteristics (structure and function) and dynamics of freshwater and coastal/ marine ecosystems. Biotic and abiotic components. Aquatic food webs. Morphological and behavioural adaptations to aquatic habitats. Characteristics (structure and function) and dynamics of wetlands. The Ramsar Convention. Physical, chemical and biological factors affecting productivity. Geochemical cycles. Impact of climate change on freshwater and coastal/ marine ecosystems. Impacts of natural and anthropogenic activities. Ecotoxicology.

AGRI 2045Y(3) - STATISTICAL METHODS FOR AGRICULTURAL SCIENCES

Introducing statistics in agriculture. Descriptive statistics – displaying and summarising data. Probability distributions. Point and interval estimation. Hypothesis testing. Analysis of categorical data. Correlation and regression analysis. Design and analysis of experiments: Principles of agricultural experimentation. Analysis of variance. Completely randomized design, Randomized block design, Latin square design. Factorial treatment structure. Non-parametric methods. Data entry and analysis using EXCEL and MINITAB.

Introduction to research methodology. Qualitative and quantitative research. Sampling methods. Questionnaire development, design and administration. Data coding and processing using SPSS. Elements of scientific and technical writing.

AGRI 2079Y(5) - WATER QUALITY AND MANAGEMENT

The hydrological cycle. Water quality, standards and water analysis. Watershed and catchment delineation. Water systems and operations for aquaculture. Processes controlling the chemical composition of seawater and freshwater. Marine and freshwater biogeochemistry. Marine and freshwater physical chemistry and thermodynamics. Chemical equilibrium dynamics. Concepts of mass balance. Eutrophication. Use of radio isotopes in biogeochemistry studies. Chemical equilibrium approach. Acid-base chemistry. Carbonate system, dissolution and precipitation.

Main types, sources and fates of aquatic pollutants. Aquaculture as a source of water pollution: hormones, vitamins, growth regulators, pesticides in water from aquaculture systems. Metal ions in solution. Oxidation-reduction chemistry. Heavy metals, polyaromatic hydrocarbons (PAH), persistent organic pollutants (POP), oil, and agrochemicals in water and soil/sediments. Mechanisms for distribution of stable and radioactive isotopes, gases, trace metals and biochemicals in the world's rivers and oceans. Radiotracer studies. Water pollution and contamination from various sources and their control. Harmful Algal Blooms (HABs). Ecotoxicological effects on living resources and humans. Economic losses due to pollution. Monitoring strategies for water quality assessment. Technologies to prevent or mitigate pollution of the aquatic environment, including minimization of wastewaters, treatment and removal of contaminants. Waste water treatment. Aquatic ecosystem remediation techniques. Polymetallic nodules.

Use of GPS, GIS, remote sensing for surveying and pollution studies.

AGRI 3042Y(5) - MARINE AQUACULTURE & TECHNOLOGY

Taxonomy, morphology, ecology, physiology, growth and development of marine and brackish fish, shellfish, finfish, crustaceans, mollusc, amphibians, corals and algal species. Mariculture of selected species of fish, crustaceans, molluscs, sea cucumbers, sea urchins, corals, algae, microalgae, pearl oysters, edible oysters, mussels and clams, and other economically important species. Genetics and breeding. Nutrition, feeding practices and behaviour. Predators, parasites, bacterial and viral diseases, nutritional and environmental disorders of marine aquaculture species. Health management. Broodstock management, spawning, larval husbandry, nursery, and grow-out. Stock management. Stress management. Environmental effects of mariculture. Impacts of mariculture on genetic diversity. Impact of escapees on natural biodiversity.

Responsible mariculture practices, and code of conduct.

Polyculture.

Design, construction and maintenance of marine aquaculture systems : Still, flow-through, recirculating aquatic culture systems. Application of seine nets, trapnets, gill nets and electroshocking fishing gear. Harvesting and processing. Economics and marketing. National, regional and international maritime laws and regulations. Regional and international conventions.

Use of GPS, GIS, remote sensing for surveying, productivity studies, movement of fish and other aquatic species.

AGRI 3043Y (5) - AQUACULTURE PRODUCTS, ENTREPRENEURSHIP AND SMALL BUSINESS MANAGEMENT

Quality control and fish handling techniques. Processing of aquatic animal and plant products. Comprehensive food safety. Technologies for harvesting (post-harvest handling & processing techniques of aquaculture products). Preservation of product value and quality.

Types of business organisations. Management of agri- and aqua-businesses: Agri- and aqua-business finance. Characteristics of small and medium agri- and aqua-businesses. Public and private organisations facilitating the setting up of an agri- and aqua- business in Mauritius. Setting up of an agri- and aqua-business and development of a business plan. Marketing strategies for an agri- and aqua-business. Case studies. Entrepreneurship: generation of business ideas and innovation. Clustering. International trade and marketing. WTO. Business incubators. Regional opportunities for agri- and aqua- business.

Project management and analysis procedures. Origins of EIA. EIA process. Screening and scoping criteria. Environmental issues. Project write-up, project appraisal, feasibility study, viability, IRR, socio-economics and ICZM.

AGRI 3070Y(5) - FRESHWATER AQUACULTURE & TECHNOLOGY

Taxonomy, morphology, ecology, biology, physiology, growth and development of freshwater fish, shellfish, crustacean, mollusc, amphibian and reptile species. Aquaculture of selected species of freshwater edible and ornamental species of fish, shellfish, crustaceans, molluscs (oysters, mussels, clams, snails, etc.), amphibian (frogs) and reptiles (crocodiles, freshwater turtles, etc.). Genetics, breeding and rearing. Nutrition, feeding practices and behaviour. Predators, parasites, bacterial and viral diseases, nutritional and environmental disorders. Health management. Broodstock management, spawning, larval husbandry, nursery, and grow-out. Stock management. Stress management. Environmental effects of aquaculture systems. Impacts of aquaculture on genetic diversity. Impact of escapes on natural biodiversity. Responsible aquaculture practices, and code of conduct.

Design, construction and maintenance of freshwater aquaculture systems : Still, flow-through, recirculating aquatic culture systems. Harvesting and processing.

Aquaponics : concept, principles and practices. Integrated farming. Polyculture

Economics and marketing. National, regional and international regulations and laws. Regional and international conventions.

AGRI 3074Y (5) - SEA FOOD HUB ACTIVITIES AND TECHNOLOGY

Seafood products. Sources and types of sea food products. Concept of a Seafood Hub. Objectives and operations of a Seafood Hub. On board and on shore handling of seafood species. Storage, warehousing, processing and distribution of sea food products. Transshipment and export of fresh, chilled and frozen or value added seafood products. Quality and safety issues. International, regional and national maritime regulations, laws and legislations. Ancillary services in the Seafood Hub. Global trends in Seafood Hub activities.

The Seafood Hub in Mauritius: history, staffing, objectives, activities, operations, and strategy. Future of the Seafood Hub in Mauritius. Regulatory framework, competent authority, auditing, registration, certification, EU directives, requirements of EU and non-EU markets.

ELECTIVES (CHOOSE ONE)

AGRI 3045Y(5) - SUSTAINABLE FISHERIES MANAGEMENT

Characteristics, dynamics, interrelationships and productivity of benthic and pelagic fish species. Fisheries assessment in different aquatic systems. Stock assessment and recruitment. Population and community dynamics. Fisheries habitat. Contaminants in fishes. Toxic species. Species of special concern. Impact of environmental changes and climate changes on marine organisms.

International, regional and national laws and legislations governing fisheries and marine resources. Regional and international conventions.

AGRI 3075Y(5) - PRINCIPLES OF OCEANOGRAPHY

Geography and geology of ocean basins. Coral reefs, estuaries, hydrothermal vents. Bathymetry.

Physical and Chemical oceanography : Dynamics of currents, waves, and tides. Coastal processes. Sedimentological and petrological processes. Water movement and circulation. Coriolis effect and Geostrophic balance. Tides, wind stress, topographic effects, still hydraulics, exchange flow.

Biological Oceanography : Distribution and interactions of marine organisms. Phytoplankton and Zooplankton. Benthic and pelagic organisms.

Local, regional and international maritime laws and regulations. Regional and international conventions.

AGRI 3000Y(5) - 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 will have to submit a dissertation not exceeding 40 pages from “Introduction” to “Conclusion”. Students should demonstrate good practice in using skills and knowledge acquired and follow guidelines as laid down.

AGRI 2000 - PRACTICAL TRAINING

Student is required to undergo a practical training of 6-8 weeks duration during winter vacation either in Year 1 or Year 2. The aim is to expose the student to the real work environment, acquaint him/her of what employers would expect of a graduate. Student is required to submit a report on her/his training placement.

This module does not carry any credit, but training must be completed satisfactorily for the award of the degree.

AGRI 3100 - SCIENTIFIC COMMUNICATION

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.

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