

# **BSc (Hons) Biotechnology (with 6-months Internship) – Full-Time – (A325E)**

## **1. CONTEXT AND OBJECTIVES**

### **Context**

Biotechnology originates in the 1950's, when the secret of life, DNA was disclosed by two UK researchers, Watson and Crick. The term is now described as a multi-disciplinary science covering a range of disciplines including molecular biology, genetics, biochemistry, analytical chemistry and bioprocess engineering. People's lives have been influenced by biotechnology for centuries as a result of the use of microorganisms to produce food and drinks. The production of antibiotics by the large-scale fermentation of microorganisms in the pharmaceutical industry has revolutionized healthcare. Biotechnological methods are now being applied to provide solutions to various problems such as the use of novel drugs for the cure of cancer, AIDS and other diseases and can also be exploited to provide environment friendly solutions to very difficult problems such as the microbial digestion of wastes for the production of biogas. Biotechnology has also a crucial role to play with respect to food security issues through the use of cell and tissue culture technology for rapid propagation of plants and techniques of molecular diagnosis as well as in human and animal health. The extensive research being undertaken in the field of genomics is set to improve peoples' lives and contribute to a better environment.

### **Objectives**

This BSc Programme has been tailored for students aspiring for a career in the field of Biotechnology and is designed to equip them with the necessary skills and competencies. The programme, additionally offers students the opportunity to undertake a 6-month internship at the end of the third year in organizations relevant to their field of study. The internship aims at enhancing practical and hands-on skills along with the technical know-how that will enable them to contribute to the growing sectors of Biosciences and Biotechnology in Mauritius and engage in the recent possibilities for medical, pharmaceutical and agricultural applications while taking care of ethical and social issues.

### **Career Opportunities**

The curriculum is broad-based and provides an education and training that is highly competitive and amenable for employment within many sectors. It prepares students for a wide range of opportunities in agricultural, clinical, public health and veterinary settings as well as in biotechnological, environmental and food testing or research laboratories. The programme also offers adequate background for specialisation through further studies or research at postgraduate level both locally and overseas.

## **2. LEARNING OUTCOMES**

Upon completion of this programme, graduates should be able to:

- Demonstrate a broad understanding of the concepts and applications of biotechnology;
- Apply their knowledge of the subject in order to solve to various problematic issues;
- Communicate effectively the information and arguments while showing critical analytical skills;
- Use a range of techniques to initiate and undertake the analysis of data and information;
- Show practical competencies and techniques in molecular biology and biotechnology;
- Describe and comment on particular aspects of recent trends in biotechnology; and
- Apply their knowledge and understanding in order to initiate and carry out an extended piece of work or project.

### 3. TEACHING AND LEARNING METHODS

Modules shall be taught over 10 weeks and shall include 3 hours of contact per week, involve 6 hours of self-study per week and 9 hours of other learning activities per week for each semester. The 30 hours of contact shall include class hours, tutorials and practicals.

The programme will be taught through a series of lectures, tutorials, interactive online activities, laboratory practicals, site-visits and student-led seminars. It also includes self-learning activities (e.g. independent learning, individual reading, use of library resources, preparation and synthesis of notes, revisions for exams) and other learning activities (e.g. group work, preparation of reports, case studies, mini-projects). All of these are meant to allow the development of generic and subject-specific competences and achievement of learning outcomes prescribed for this programme of study.

### 4. ENTRY REQUIREMENTS

- **General Requirements**

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

- **Programme (Specific) Requirements**

Credit in Mathematics, Chemistry and/or Biology at 'O' level

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

### 5. PROGRAMME DURATION

	<b>Normal (Years)</b>	<b>Maximum (Years)</b>
<b>Degree</b>	3.5	5.5

### 6. LCCS CREDITS TO BE EARNED: -

**Minimum and Maximum number of LCCS Credits per year:**

Minimum – 12 LCCS Credits per year subject to Section 3.4 of the UoM Regulations

Maximum – 96 LCCS Credits per year subject to Section 3.4 of the UoM Regulations

**Total Number of LCCS Credits required to earn the award is 222**

**Exit Points:**

The student can exit the programme with a Diploma or Certificate, as follows:

	<b>LCCS Credits</b>
Diploma in Biotechnology	120
Certificate in Biotechnology	60

## 7. ASSESSMENT AND DEADLINES

Continuous Assessment : 40%

Examinations : 60%

The achievement of the modules' learning outcomes will be assessed through a variety of methods (e.g. exams, class tests, reports, field visits). Each module will be assessed over 100 marks (*i.e.* expressed as %) unless otherwise specified.

Assessment will be based on a written examination of 2 - 3 hours' duration, carrying a weighting of 60 %, and continuous assessment carrying 40% of total marks. Continuous assessment will be based on class and laboratory activities/field visits/case studies, and /or other assignments, and should include at least 1 class test per module.

An overall total of 40 % for combined continuous assessment and written examination components would be required to pass a module, without minimum thresholds within 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.

Modules will carry LCCS credits in the range of 2 to 12, except for the dissertation and internship which carry 18 LCCS Credits.

The internship of 6 months will be undertaken at the end of Year 3 after the Yearly Examinations and will carry 18 LCCS Credits.

A final year dissertation (8,000 – 12,000 words) should be submitted to the Faculty Registry as per the deadline stated in the latest Regulations for Undergraduate Programmes.

## 8. LIST OF MODULES

Module Code	Module Name	Contact Hours (L*/T*/P*)	Self-Study Hours	Other Learning Hours	LCCS Credits
AGRI 1046Y(1)	Chemistry Fundamentals and Biochemistry	60	120	180	12
AGRI 1048Y(1)	Cell Biology and Biotechnology	60	120	180	12
AGRI 1056Y(1)	Introductory Statistics	30	60	90	6
AGRI 1057Y(1)	Basic Microbiology and Techniques	60	120	180	12
AGRI 1077Y(1)	Biotechniques	30	60	90	6
AGRI 10105Y(1)	Principles of Genetics	30	60	90	6
AGRI 1148Y(1)	Fundamentals of Animal Science	30	60	90	6
AGRI 1149Y(1)	Introduction to Plant Science	30	60	90	6
AGRI 1153(1)	Effective Scientific Communication: Principles and Practice I *	20	40	60	4
AGRI 2009Y(3)	Cell and Tissue Culture	60	120	180	12
AGRI 2066Y(3)	Immunology and Molecular Pathology	40	80	120	8
AGRI 20135Y(3)	Statistical Methods	30	60	90	6
AGRI 20136Y(3)	Computational Biology	60	120	180	12
AGRI 20137Y(3)	Cellular Biochemistry and Human Physiology	40	80	120	8
AGRI 20140Y(3)	Industrial, Marine and Environmental Biotechnology	40	80	120	8
AGRI 20141Y(3)	Molecular Biology and Biotechniques	40	80	120	8
AGRI 2279(1)	Effective Scientific Communication: Principles and Practice II *	10	20	30	2
AGRI 3000Y(5)	Project	0	0	540	18
AGRI 3005Y(5)	GMOs, Biosafety and Bioethics	60	120	180	12
AGRI 30001Y(5)	Genomics and Transcriptomics	40	80	120	8
AGRI 3066Y(5)	Plant Biotechnology	60	120	180	12
AGRI 3067Y(5)	Biotechnology for Medical and Veterinary Applications	60	120	180	12
AGRI 3068Y(5)	Bioinformatics	40	80	120	8
AGRI 4101(1)	Professional Development	10	0	20	0
AGRI 4100(1)	Internship	0	0	540	18
<b>GRAND TOTAL</b>		<b>940</b>	<b>1860</b>	<b>3890</b>	<b>222</b>

Basic module in biology for students who do not have SC level Biology

Module Code	Module Name	Contact Hours (L*/T*/P*)	Self-Study Hours	Other Learning Hours	LCCS Credits
AGRI 1000	Structure and Function of Multicellular Organisms and Ecosystems	30	60	90	0

\* *Semester II Module*

Contact Hours= Lectures, T\* = Tutorials, P\* = Practicals

## 9. PROGRAMME PLAN

### YEAR 1

Code	Module Name	Contact Hours (L*/T*/P*)	LCCS Credits
AGRI 1046Y(1)	Chemistry Fundamentals and Biochemistry	60	12
AGRI 1048Y(1)	Cell Biology and Biotechnology	60	12
AGRI 1056Y(1)	Introductory Statistics	30	6
AGRI 1057Y(1)	Basic Microbiology and Techniques	60	12
AGRI 1077Y(1)	Biotechniques	30	6
AGRI 10105Y(1)	Principles of Genetics	30	6
AGRI 1148Y(1)	Fundamentals of Animal Science	30	6
AGRI 1149Y(1)	Introduction to Plant Science	30	6
AGRI 1153(1)	Effective Scientific Communication: Principles and Practice I *	20	4
<b>Sub Total</b>		<b>350</b>	<b>70</b>

\* Semester II Module

For students who **do not** have Biology at SC level

Code	Module Name	Contact Hours (L*/T*/P*)	LCCS Credits
AGRI 1000	Structure and Function of Multicellular Organisms and Ecosystems <sup>o</sup>	30	0

### YEAR 2

Code	Module Name	Contact Hours (L*/T*/P*)	LCCS Credits
AGRI 2009Y(3)	Cell and Tissue Culture	60	12
AGRI 2066Y(3)	Immunology and Molecular Pathology	40	8
AGRI 20135Y(3)	Statistical Methods	30	6
AGRI 20136Y(3)	Computational Biology	60	12
AGRI 20137Y(3)	Cellular Biochemistry and Human Physiology	40	8
AGRI 20140Y(3)	Industrial, Marine and Environmental Biotechnology	40	8
AGRI 20141Y(3)	Molecular Biology and Biotechniques	40	8
AGRI 2279(1)	Effective Scientific Communication: Principles and Practice II *	10	2
<b>Sub Total</b>		<b>320</b>	<b>64</b>

\* Semester II Module

**YEAR 3**

<b>Code</b>	<b>Module Name</b>	<b>Contact Hours (L*/T*/P*)</b>	<b>LCCS Credits</b>
AGRI 3000Y(5)	Project	0	18
AGRI 3005Y(5)	GMOs, Biosafety and Bioethics	60	12
AGRI 30001Y(5)	Genomics and Transcriptomics	40	8
AGRI 3066Y(5)	Plant Biotechnology	60	12
AGRI 3067Y(5)	Biotechnology for Medical and Veterinary Applications	60	12
AGRI 3068Y(5)	Bioinformatics	40	8
<b>Sub Total</b>		<b>260</b>	<b>70</b>

**YEAR 4**

<b>Code</b>	<b>Module Name</b>	<b>Contact Hours (L*/T*/P*)</b>	<b>LCCS Credits</b>
AGRI 4101(1)	Professional Development	10	0
AGRI 4100(1)	Internship	0	18
<b>Sub Total</b>		<b>10</b>	<b>18</b>
<b>Grand Total</b>		<b>940</b>	<b>222</b>

***\* This programme has been amended as follows:***

*Year Programme was launched: 2019*

*Year programme was revised: 2020*