UNIVERSITI SAINS MALAYSIA

# SCHOOL OF BIOLOGICAL SCIENCES

## COURSE BOOKLET

Bachelor of Applied Science in
**Agrobiology with Honours**

Bachelor of Applied Science in
**Biotechnology with Honours**

Bachelor of Applied Science in
**Entomology and Parasitology with Honours**

Bachelor of Applied Science in
**Environmental Biology with Honours**



ACADEMIC SESSION
**2026/2027**

**Introduction**

We are committed to excellence in research and teaching, driven by a team of research-active members with diverse academic and professional backgrounds. We offer exciting opportunities to students over a wide variety of topics related to Biological Sciences. In the first year, students gain essential fundamental knowledge in key areas such as ecosystems, biodiversity, plant and animal biology as well as microbial and cellular processes.

In four (4) years, upon successful completion of courses in the respective programme, these pathways lead to the award of:

- a Bachelor of Applied Science in Agrobiology with Honours
- a Bachelor of Applied Science in Biotechnology with Honours
- a Bachelor of Applied Science in Entomology and Parasitology with Honours
- a Bachelor of Applied Science in Environmental Biology with Honours

Students are required to undergo an internship programme in the final semester of their programme. This six (6)-month internship programme provides students with invaluable industry and corporate experience, with the possibility of future employment.

Students graduating from the School of Biological Sciences will be equipped with the following knowledge comprising of:

a. The diversity and function of all life on earth.
b. Interactive relationships between organisms and the environment.
c. Preservation of ecosystem and associated functions.
d. Intricate relationships between life forms and their environments.
e. Designing and conducting scientific experiments.
f. Acquiring perceptive and logical flow in scientific writing and communication.

The knowledge acquired by the students will enable them to make informed and educated decisions concerning the current global environmental issues such as pollution, environmental deterioration, biodiversity loss, deforestation, global warming and climate change. Students develop innovative skills and are able to generate and test new ideas**.** This essential knowledge aids students to excel in any career path they choose. The School of Biological Sciences is proud to produce students who can think holistically to live in harmony with nature and ensure a sustainable future.

**Vision**

Centre of excellence for education and research in the field of biological sciences.

**Mission**

1. To provide quality and innovative teaching and learning for its degree programmes.
2. To achieve research excellence.
3. To establish and enhance collaboration with industries for education input and research.
4. To serve society and country by providing the latest knowledge and technology.

There are four (4) areas of specialisation/major:-

1. **Bachelor of Applied Science in Agrobiology with Honours**



**Agrobiology:** The Agrobiology programme encompasses the use of modern biological techniques in the agricultural output system. The main objective of this programme is to explore various approaches in the agriculture system to ensure optimum and economical plant health and yield. Students learn basic entomology and roles of insects in agricultural systems, and an introduction to plant pathology centred on an understanding of plant diseases, disease mechanisms and pathogen interactions. Students are also equipped with basic knowledge in insect pest management strategies to gain an insight into the development of plant disease control methods and management strategies. The ultimate goal of the program is to be able to handle problems related to plant productivity in the development of agriculture-based industry in the country.

2. **Bachelor of Applied Science in Biotechnology with Honours**



**Biotechnology:** Biotechnology, an area of applied biology, involves the practical application of cells or their components in the manufacturing and service industries. Biotechnology is multidisciplinary, involving the integration of knowledge from microbiology, biochemistry, genetics, molecular and structural biology, chemistry as well as chemical and process engineering. The programme aims to provide students with a sound understanding of cellular biology involving microbiology, biochemistry, genetics, molecular biology and some chemical engineering principles. The programme begins with core courses in the sciences, especially biology, to build a strong foundation, followed by an introduction to the various techniques employed in the biotechnological industries and several critical aspects of microbiology. This is followed by several advanced topics of biotechnology that cover animal and plant cell cultures, enzyme technology, chemical engineering principles, bioinformatics, structural biology and an in-depth treatment of genetic engineering.

### 3. Bachelor of Applied Science in Entomology and Parasitology with Honours



**Entomology and Parasitology:** Even in the midst of modernisation, many tropical and temperature countries continue to be affected by vector-borne diseases like malaria, filariasis, dengue/haemorrhagic dengue and other diseases. These issues have brought a high rate of illness and mortality to many tropical nations. The field of Entomology and Parasitology was initiated with the objective of increasing the knowledge and understanding of the biology of insect vectors such as mosquitoes and houseflies and their relationships with the disease parasites or pathogens that they transmit. In this thrust area, students are exposed to the structure and function, life history, ecology and vector and parasite behaviour that will assist in the understanding of disease epidemiology as well as various management strategies. In addition, students specialising in the field will also learn the biology, ecology, behaviour and management of important urban and industrial insect pests such as cockroaches, pest ants, termites, bed bugs and stored product insects that are most relevant to the pest management industries.

### 4. Bachelor of Applied Science in Environmental Biology with Honours



**Environmental Biology:** In the Environmental Biology course, students will explore how ecosystems function and how human activities shape the natural world. The course introduces the core principles of environmental biology, including biodiversity, energy flow, nutrient cycling, and population dynamics. Principles of environmental management, sustainable aquaculture, and conservation provide the foundation for an applied approach to environmental issues. In line with national environmental priorities and global Sustainable Development Goals, students will apply scientific reasoning to develop sustainable solutions addressing climate change, habitat degradation, pollution, and biological invasions. Through interactive lectures, hands-on fieldwork, and collaborative discussions, they will gain the skills to critically assess environmental challenges and contribute to a more sustainable future.

**Curriculum and Graduation Structure**

In order to qualify for the Bachelor of Applied Science in Agrobiology / Biotechnology / Entomology and Parasitology / Environmental Biology with Honours

students are required to fulfil the following requirements:

1. Accumulate a total of **126-129** units.
2. Fulfil all credit requirements for each course component (Core, Elective and University).
3. Obtain a minimum CGPA of 2.00 for the Core courses.
4. Obtain a minimum CGPA of 2.00 for the programme.
5. Obtain a minimum grade C for all University courses.

| **Course component** | | **Course code** | **Minimum no. of units required** |
|---|---|---|---|
| **CORE** | Basic<br>• 39 units<br>Required<br>• 36 – 39 units | **T** | 75 – 78 |
| **ELECTIVE** | | **E** | 33 |
| **UNIVERSITY** | | **U** | 18 |
| | | **TOTAL** | **126 – 129** |

**University requirements (18 units)**

Students are required to complete a total of 18 units of the following courses for University requirements. These courses are compulsory for all students and must obtain a **minimum grade C.**

| UNIVERSITY COURSE REQUIREMENTS | | | CREDIT TOTAL | |
|---|---|---|---|---|
| | | | Local Students | International Students |
| **General Studies (MPU)** | | | | |
| U1 | Local Students<br>▪ HFF226 (Philosophy and Current Challenges) (2 credits)<br>▪ SHE102 (Malaysian Nation -State Aspiration (2 credits)<br>▪ WAR122 (Integrity and Anti-Corruption) (2 credits)<br>International Students of Science and Technology<br>▪ SHE103E (Malaysian Citra 1) (2 credits)<br>▪ Malay Language course (2 credits)<br>▪ WAR123E (Integrity and Anti-Corruption) (2 credits) | | 6 | 6 |
| U2 | Local Students<br>▪ LKM400 (Malay Language IV) (2 credits)<br>▪ English Language Course (2 credits)*<br>International Students<br>▪ English Language Course (2 credits)* | | 4 | 2 |
| U3 | Local Students<br>▪ WUS101 (Core Entrepreneurship) (2 credits)<br>International Students<br>▪ SHE104E (Malaysian Citra 2) (2 credits) | | 2 | 2 |
| U4 | Local Students<br>Co-Curricular Courses* | International Students<br>Co-Curricular Courses* | 2 | 2 |
| **Options** | Students can/have to choose any of the following:<br>▪ Co-curricular courses<br>▪ Skill courses/Foreign Language Courses/ Other courses offered by other schools | | 4 | 6 |
| | **CREDIT TOTAL** | | **18** | **18** |

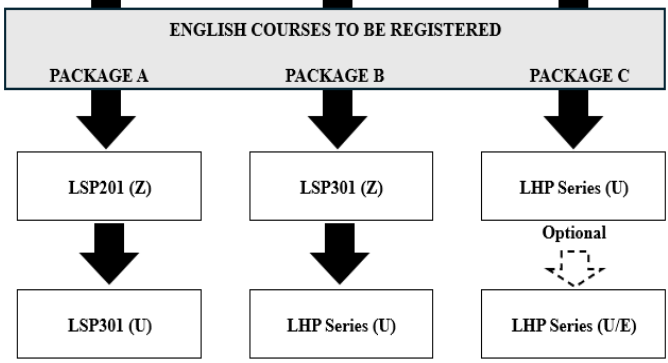
**English Language Course**

**Local and International Students**

All bachelor's degree students must accumulate two (2) units of type U from the English Language courses to fulfil the University requirement for graduation. However, students may be required to take an English Language course as a prerequisite (Z) first based on their English Language qualification and the determined package.

The following chart shows the English Language registration packages for students with MUET, IELTS, TOEFL iBT or PTE:

| Type of Entry Qualification | Result | | |
|---|---|---|---|
| MUET | 3.5 & below | 4.0 – 4.5 | 5.0 & above |
| IELTS | 5.0 & below | 5.5 – 6.5 | 7.0 & above |
| TOEFL iBT | 40 & below | 41 – 79 | 80 & above |
| PTE | 47 & below | 48 – 63 | 64 & above |




Notes:

- Students shall refer to the list of English language courses prescribed by their respective schools, particularly for advanced-level courses that may be required by certain schools.
- Students with qualifications not listed in the chart above will take courses under Package A.
- To obtain units in English Language courses, students have to obtain a minimum grade 'C'.

**Core courses (75 – 78 units)**

The Core Courses component is made up of courses of 100, 200, 300 and 400 levels. The courses include Basic Core courses *(Teras Asas)* and Required Core courses *(Teras Wajib)*. Courses in the Basic Core and Required Core groups are compulsory, where students must attain passing grades.

**Basic core courses (39 units)**

All undergraduate students must enrol and attain passing grades for these courses and must obtain a total of **39 units**. The courses are as follows:-

| Year | Semester | Course Code | Course Title | Course Prerequisite | Total Units |
|---|---|---|---|---|---|
| 1 | 1 | KOT122/4 | Organic Chemistry I | | 27 |
| | 1 or 2 | BOI101/3 | Organisms Biodiversity | | |
| | | BOI102/3 | Ecology | | |
| | | BOI103/4 | Principles of Biochemistry | | |
| | | BOI104/4 | Genetics | | |
| | | BOI105/4 | Biostatistics | | |
| | | BOI106/3 | General Microbiology | | |
| | | BOI107/2 | Practical of Biodiversity and Ecology | BOI101/3 | |
| 4 | 2 | BOI420/12 | Industrial Training | | 12 |

**Required core courses (36 - 39 units)**

Required Core courses are those courses offered at Levels 200, 300, and 400 that have been identified according to each specialisation programme, namely **Agrobiology**, **Entomology and Parasitology**, **Biotechnology** and **Environmental Biology.** Students must enrol in all the required core courses that are listed in their respective field of specialisation.

**Research Project (8 units)**

All Biology students are required to register for a research project of 8 units which spans over two semesters. At the end of the second semester, a thesis based on the existing regulations and format must be submitted for examination.

Before a student is allowed to register for the research project in their respective field of specialisation, the student must have achieved these **minimum cumulative unit requirement**.

- Total overall unit = 45 – 77 units
- Total unit for Biology courses = 39 – 54 units

Students who do not register for a research project, with valid reason and approved by the Dean, must substitute the 8 units with BOE 300/4 – Critical Review in Biology (which carries 4 units), while the remaining 4 units are fulfilled by taking elective courses that are suitable with his/her field of specialisation and approved by the Programme Chairman.

## BACHELOR OF APPLIED SCIENCE IN AGROBIOLOGY WITH HONOURS

The Programme Educational Objective is to nurture:

| | |
|---|---|
| PEO1 | graduates who possess comprehensive knowledge, think critically and innovatively, and apply proficient technical skills to solve complex problems in the field of Agrobiology. |
| PEO2 | graduates who are capable of communicating effectively and working collaboratively in diverse settings. |
| PEO3 | graduates who are proficient in digital and numeracy skills and demonstrate responsibility and leadership in their careers. |
| PEO4 | graduates who are committed to self-development, possess an entrepreneurial mindset, and uphold ethics and professionalism in their careers. |

### PROGRAMME LEARNING OUTCOMES (PLO)

Upon the completion of Bachelor of Applied Science in *Agrobiology* with Honours, the students will be able to:

| | |
|---|---|
| PLO1 | acquire and demonstrate comprehensive knowledge and understanding of both fundamental and advanced concepts with the ability to integrate scientific principles, theoretical frameworks, and current developments in the field of Agrobiology. |
| PLO2 | analyze and solve issues critically, creatively, and innovatively employing appropriate techniques, tools, and approaches in matters related to Agrobiology. |
| PLO3 | demonstrate precision and competence in executing technical procedures and integrating practical skills in both laboratory and field environments within Agrobiology. |
| PLO4 | demonstrates constructive interpersonal interactions when engaging with peers, professionals, and communities in addressing issues related to Agrobiology. |
| PLO5 | acquire and apply effective communication skills across various contexts to convey information, ideas, and scientific knowledge in Agrobiology. |
| PLO6 | demonstrate fundamental digital skills for career development by effectively utilizing digital tools, data analysis software, and online platforms to access, manage, and present scientific information across various domains of Agrobiology. |
| PLO7 | demonstrate numeracy skills across various aspects of life by accurately interpreting, analyzing, and presenting scientific data using appropriate quantitative methods particularly in Agrobiology. |
| PLO8 | demonstrate the values of responsibility, teamwork, and leadership when functioning both independently and collaboratively in organizational and personal planning contexts. |
| PLO9 | effectively manage and evaluate current and emerging information, while recognizing the importance of lifelong learning in mastering knowledge and developing knowledge with a commitment for continuous self-improvement in a dynamic global context related to Agrobiology. |
| PLO10 | acquire the foundation of entrepreneurial knowledge and mindset for career development by identifying opportunities and solutions particularly in the context of Agrobiology. |
| PLO11 | consistently apply and uphold ethical principles, integrity, and professional values in understanding, evaluating, and conducting scientific practices within the field of Agrobiology. |

**Required core courses**

| Course Code | Course Title | Semester | Course Prerequisite | |
|---|---|---|---|---|
| **Required Core – Level 200 = 19 units** | | | | |
| BDT204/3 | Plant Tissue Culture | 1 & 2 | BOI101/3 | (S) |
| BDT212/4 | Plant Physiology and Development | 2 | BOI101/3 | (S) |
| BET212/4 | Insect Biology and Systematics | 1 | BOI101/3 | (S) |
| BGT211/3 | Plant Pathology | 1 | BOI101/3 | (S) |
| BGT212/2 | Practical In Plant Pathology | 1 | BGT211/3 | (C) |
| BGT213/3 | Soil Science and Environment | 1 | BOI102/3 | (S) |
| **Required Core - Level 300 = 15 Units** | | | | |
| BGT300/8<br>or<br>*BOE300/4 | Research Project in Agrobiology<br><br>Critical Review in Biology | 1 & 2<br><br>1 & 2 | Must have achieved: -<br>i. Total overall unit = 45-77 units<br>ii. Total unit for Biology course 39 – 54 units | |
| BGT314/4 | Tropical Plant Disease Management | 1 | BGT211/3<br>BGT212/2 | (S)<br>(S) |
| BGT325/3 | Horticultural Science | 2 | BDT212/4 | (S) |
| **Required Core - Level 400 = 5 Units** | | | | |
| BGT416/3 | Agriculture, Forest and Stored Product Pests | 1 | BET212/4 | (S) |
| BGT417/2 | Plant Breeding | 1 | BDT204/3 | (S) |
| * Requires 4 more units from Elective courses | | | | |
| BDT327/4 | Genetics and Genomics of Plant and Animal | 2 | BOI101/4<br>BOI104/4 | (S)<br>(S) |
| BDT418/3 | Economy Botany | 1 | BOI101/4 | (S) |
| BET419/3 | Integrated Pest Management | 1 | BET212/3 | (S) |
| BGE416/3 | Biology of Vertebrate Pest Animals | 1 | BOI101/4 | (S) |
| BMT327/3 | Soil Microbiology | 2 | BOI106/3 | (S) |
| BMT314/3 | Mycology | 1 | BOI106/3 | (S) |
| BST418/4 | Sustainable Aquaculture | 1 | BOI102/3 | (S) |
| BOE101/3 | Biological Instrumentation | 1 & 2 | BOI103/4 | (S) |
| BOE202/3 | Introduction to Bioinformatics | 1 & 2 | BOI 104/4 | (S) |
| BOE203/3 | Microscopy and Histological Techniques | 1 & 2 | | |
| BOE311/2 | Scientific Communications | 1 & 2 | | |
| Students can choose elective courses from: -<br>i. Major package (33 units); or<br>ii. Major package (17 units) and courses other than major package (16 units); or<br>iii. Major package (17 units) and package courses from other school subjects to prerequisite requirement (16 units). | | | | |

(S) = Course must be taken in sequential order.

(C) = Course must be taken concurrently.

**BACHELOR OF APPLIED SCIENCE IN BIOTECHNOLOGY WITH HONOURS**

The Programme Educational Objective is to nurture:

| | |
|---|---|
| PEO1 | graduates who possess comprehensive knowledge, think critically and innovatively, and apply proficient technical skills to solve complex problems in the field of biotechnology. |
| PEO2 | graduates who are capable of communicating effectively and working collaboratively in diverse settings. |
| PEO3 | graduates who are proficient in digital and numeracy skills and demonstrate responsibility and leadership in their careers. |
| PEO4 | graduates who are committed to self-development, possess an entrepreneurial mindset, and uphold ethics and professionalism in their careers. |

**PROGRAMME LEARNING OUTCOMES (PLO)**

Upon the completion of Bachelor of Applied Science in *Biotechnology* with Honours, the students will be able to:

| | |
|---|---|
| PLO1 | acquire and demonstrate comprehensive knowledge and understanding of both fundamental and advanced concepts with the ability to integrate scientific principles, theoretical frameworks, and current developments in the field of Biotechnology. |
| PLO2 | analyze and solve issues critically, creatively, and innovatively employing appropriate techniques, tools, and approaches in matters related to Biotechnology. |
| PLO3 | demonstrate precision and competence in executing technical procedures and integrating practical skills in both laboratory and field environments within Biotechnology. |
| PLO4 | demonstrates constructive interpersonal interactions when engaging with peers, professionals, and communities in addressing issues related to Biotechnology. |
| PLO5 | acquire and apply effective communication skills across various contexts to convey information, ideas, and scientific knowledge in Biotechnology. |
| PLO6 | demonstrate fundamental digital skills for career development by effectively utilizing digital tools, data analysis software, and online platforms to access, manage, and present scientific information across various domains of Biotechnology. |
| PLO7 | demonstrate numeracy skills across various aspects of life by accurately interpreting, analyzing, and presenting scientific data using appropriate quantitative methods particularly in Biotechnology. |
| PLO8 | demonstrate the values of responsibility, teamwork, and leadership when functioning both independently and collaboratively in organizational and personal planning contexts. |
| PLO9 | effectively manage and evaluate current and emerging information, while recognizing the importance of lifelong learning in mastering knowledge and developing knowledge with a commitment for continuous self-improvement in a dynamic global context related to Biotechnology. |
| PLO10 | acquire the foundation of entrepreneurial knowledge and mindset for career development by identifying opportunities and solutions particularly in the context of Biotechnology. |
| PLO11 | consistently apply and uphold ethical principles, integrity, and professional values in understanding, evaluating, and conducting scientific practices within the field of Biotechnology. |

**Required core courses**

| Course Code | Course Title | Semester | Course Prerequisite | |
|---|---|---|---|---|
| **Required Core - Level 200 = 12 Units** | | | | |
| BDT204/3 | Plant Tissue Culture | 1 & 2 | BOI101/3 | (S) |
| BMT210/3 | Microbial Physiology | 1 | BOI101/3<br>BOI103/4<br>BOI106/3 | (S)<br>(S)<br>(S) |
| BMT223/3 | Immunology | 2 | BOI106/3 | (S) |
| BTT211/3 | Techniques in Biotechnology | 1 & 2 | BOI103/4 | (S) |
| **Required Core - Level 300 = 20 Units** | | | | |
| BMT326/3 | Microbial Genetics | 2 | BOI104/4<br>BOI106/3 | (S)<br>(S) |
| BTT300/8 or<br>*BOE 300/4 | Research Project in Biotechnology<br><br>Critical Review in Biology | 1 & 2<br><br>1 & 2 | Must have achieved: -<br>i. Total overall unit = 45-77 units<br>ii. Total unit for Biology course 39 – 54 units | |
| BTT312/3 | Fermentation Technology | 1 | BOI103/4 | (S) |
| BTT313/3 | Genomics | 1 | BOI104/3 | (S) |
| BTT324/3 | Biochemical Engineering | 2 | KOT122/4<br>BOI103/4 | (S)<br>(S) |
| **Required Core - Level 400 = 6 Units** | | | | |
| BET418/3 | Medical and Veterinary Helminthology | 1 | BET211/4 | (S) |
| BET419/3 | Integrated Pest Management | 1 | BET212/3 | (S) |
| * Requires 4 more units from Elective courses | | | | |
| **Elective = 33 Units** | | | | |
| BDT223/4 | Invertebrate & Vertebrate Biology | 1 | BOI101/3 | (S) |
| BEE414/3 | Parasite of Aquatic Animals | 1 | BET211/4 | (S) |
| BGT416/3 | Agriculture, Forest and Store Product Pests | 1 | BET212/4 | (S) |
| BMT223/3 | Immunology | 2 | BOI106/3 | (S) |
| BSE311/3 | Introduction to Geographical Information Systems (GIS) | 1 | BOI102/3<br>BST212/3 | (S) |
| BST212/3 | Tropical Ecosystem | 1 | BOI102/3<br>BOI107/2 | (S)<br>(S) |
| BST315/3 | Invasive Species and Biosecurity | 1 | BOI102/3<br>BOI107/2 | (S)<br>(S) |
| BTT211/3 | Techniques in Biotechnology | 1 & 2 | BOI103/4 | (S) |
| BOE101/3 | Biological Instrumentation | 1 & 2 | BOI103/4 | (S) |
| BOE202/3 | Introduction to Bioinformatics | 1 & 2 | BOI104/4 | (S) |
| BOE203/3 | Microscopy and Histological Techniques | 1 & 2 | | |
| BOE311/2 | Scientific Communication | 1 & 2 | | |
| Students can choose elective courses from: -<br>i. Major package (33 units); or<br>ii. Major package (17 units) and courses other than major package (16 units); or<br>iii. Major package (17 units) and package courses from other school subjects to prerequisite requirement (16 units) | | | | |

(S) = Course must be taken in sequential order.

(C) = Course must be taken concurrently.

**BACHELOR OF APPLIED SCIENCE IN ENTOMOLOGI AND PARASITOLOGY WITH HONOURS**

The Programme Educational Objective is to nurture:

| | |
|---|---|
| PEO1 | graduates who possess comprehensive knowledge, think critically and innovatively, and apply proficient technical skills to solve complex problems in the field of Entomology and Parasitology. |
| PEO2 | graduates who are capable of communicating effectively and working collaboratively in diverse settings. |
| PEO3 | graduates who are proficient in digital and numeracy skills and demonstrate responsibility and leadership in their careers. |
| PEO4 | graduates who are committed to self-development, possess an entrepreneurial mindset, and uphold ethics and professionalism in their careers. |

**PROGRAMME LEARNING OUTCOMES (PLO)**

Upon the completion of Bachelor of Applied Science in Honours or *Entomology and Parasitology* with Honours, the students will be able to:

| | |
|---|---|
| PLO1 | acquire and demonstrate comprehensive knowledge and understanding of both fundamental and advanced concepts with the ability to integrate scientific principles, theoretical frameworks, and current developments in the field of Entomology and Parasitology. |
| PLO2 | analyze and solve issues critically, creatively, and innovatively employing appropriate techniques, tools, and approaches in matters related to Entomology and Parasitology. |
| PLO3 | demonstrate precision and competence in executing technical procedures and integrating practical skills in both laboratory and field environments within Entomology and Parasitology. |
| PLO4 | demonstrates constructive interpersonal interactions when engaging with peers, professionals, and communities in addressing issues related to Entomology and Parasitology. |
| PLO5 | acquire and apply effective communication skills across various contexts to convey information, ideas, and scientific knowledge in Entomology and Parasitology. |
| PLO6 | demonstrate fundamental digital skills for career development by effectively utilizing digital tools, data analysis software, and online platforms to access, manage, and present scientific information across various domains of Entomology and Parasitology. |
| PLO7 | demonstrate numeracy skills across various aspects of life by accurately interpreting, analyzing, and presenting scientific data using appropriate quantitative methods particularly in Entomology and Parasitology. |
| PLO8 | demonstrate the values of responsibility, teamwork, and leadership when functioning both independently and collaboratively in organizational and personal planning contexts. |
| PLO9 | effectively manage and evaluate current and emerging information, while recognizing the importance of lifelong learning in mastering knowledge and developing knowledge with a commitment for continuous self-improvement in a dynamic global context related to Entomology and Parasitology. |
| PLO10 | acquire the foundation of entrepreneurial knowledge and mindset for career development by identifying opportunities and solutions particularly in the context of Entomology and Parasitology. |
| PLO11 | consistently apply and uphold ethical principles, integrity, and professional values in understanding, evaluating, and conducting scientific practices within the field of Entomology and Parasitology. |

**Required core courses**

| Course Code | Course Title | Semester | Course Prerequisite | |
|---|---|---|---|---|
| **Required Core - Level 200 = 14 Units** | | | | |
| BET211/4 | Introductory Parasitology | 1 | BOI101/3 | (S) |
| BET212/4 | Insect Biology and Systematics | 1 | BOI101/3 | (S) |
| BET223/3 | Insect Ecology | 2 | BOI101/3 | (S) |
| BET224/3 | Insect Physiology and Biochemistry | 2 | BET212/4 | (S) |
| **Required Core - Level 300 = 18 Units** | | | | |
| BET300/8 or *BOE300/4 | Research Project in Entomology & Parasitology<br>Critical Review in Biology | 1 & 2<br>1 & 2 | Must have achieved: -<br>i. Total overall unit = 45-77 units<br>ii. Total unit for Biology course 39 – 54 units | |
| BET315/4 | Medical and Urban Entomology | 2 | BET212/4 | (S) |
| BET326/3 | Pesticide Science | 1 | BET212/4 | (S) |
| BET327/3 | Medical and Veterinary Protozoology | 2 | BET211/4 | (S) |
| **Required Core - Level 400 = 6 Units** | | | | |
| BET418/3 | Medical and Veterinary Helminthology | 1 | BET211/4 | (S) |
| BET419/3 | Integrated Pest Management | 1 | BET212/3 | (S) |
| * Requires 4 more units from Elective courses | | | | |
| **Elective = 33 Units** | | | | |
| BDT223/4 | Invertebrate & Vertebrate Biology | 1 | BOI101/3 | (S) |
| BEE414/3 | Parasite of Aquatic Animals | 1 | BET211/4 | (S) |
| BGT416/3 | Agriculture, Forest and Store Product Pests | 1 | BET212/4 | (S) |
| BMT223/3 | Immunology | 2 | BOI106/3 | (S) |
| BSE311/3 | Introduction to Geographical Information Systems (GIS) | 1 | BOI102/3<br>BST212/3 | (S) |
| BST212/3 | Tropical Ecosystem | 1 | BOI102/3<br>BOI107/2 | (S)<br>(S) |
| BST315/3 | Invasive Species and Biosecurity | 1 | BOI102/3<br>BOI107/2 | (S)<br>(S) |
| BTT211/3 | Techniques in Biotechnology | 1 & 2 | BOI103/4 | (S) |
| BOE101/3 | Biological Instrumentation | 1 & 2 | BOI103/4 | (S) |
| BOE202/3 | Introduction to Bioinformatics | 1 & 2 | BOI104/4 | (S) |
| BOE203/3 | Microscopy and Histological Techniques | 1 & 2 | | |
| BOE311/2 | Scientific Communication | 1 & 2 | | |
| Students can choose elective courses from: -<br>i. Major package (33 units); or<br>ii. Major package (17 units) and courses other than major package (16 units); or<br>iii. Major package (17 units) and package courses from other school subjects to prerequisite requirement (16 units). | | | | |

(S) = Course must be taken in sequential order.

(C) = Course must be taken concurrently.

**BACHELOR OF APPLIED SCIENCE IN ENVIRONMENTAL BIOLOGY WITH HONOURS**

The Programme Educational Objective is to nurture:

| | |
|---|---|
| PEO1 | graduates who possess comprehensive knowledge, think critically and innovatively, and apply proficient technical skills to solve complex problems in the field of Environmental Biology. |
| PEO2 | graduates who are capable of communicating effectively and working collaboratively in diverse settings |
| PEO3 | graduates who are proficient in digital and numeracy skills and demonstrate responsibility and leadership in their careers. |
| PEO4 | graduates who are committed to self-development, possess an entrepreneurial mindset, and uphold ethics and professionalism in their careers. |

**PROGRAMME LEARNING OUTCOMES (PLO)**

Upon the completion of Bachelor of Applied Science in *Environmental Biology* with Honours, the students will be able to:

| | |
|---|---|
| PLO1 | acquire and demonstrate comprehensive knowledge and understanding of both fundamental and advanced concepts with the ability to integrate scientific principles, theoretical frameworks, and current developments in the field of Environmental Biology. |
| PLO2 | analyze and solve issues critically, creatively, and innovatively employing appropriate techniques, tools, and approaches in matters related to Environmental Biology. |
| PLO3 | demonstrate precision and competence in executing technical procedures and integrating practical skills in both laboratory and field environments within Environmental Biology. |
| PLO4 | demonstrates constructive interpersonal interactions when engaging with peers, professionals, and communities in addressing issues related to Environmental Biology. |
| PLO5 | acquire and apply effective communication skills across various contexts to convey information, ideas, and scientific knowledge in Environmental Biology. |
| PLO6 | demonstrate fundamental digital skills for career development by effectively utilizing digital tools, data analysis software, and online platforms to access, manage, and present scientific information across various domains of Environmental Biology. |
| PLO7 | demonstrate numeracy skills across various aspects of life by accurately interpreting, analyzing, and presenting scientific data using appropriate quantitative methods particularly in Environmental Biology. |
| PLO8 | demonstrate the values of responsibility, teamwork, and leadership when functioning both independently and collaboratively in organizational and personal planning contexts. |
| PLO9 | effectively manage and evaluate current and emerging information, while recognizing the importance of lifelong learning in mastering knowledge and developing knowledge with a commitment for continuous self-improvement in a dynamic global context related to Environmental Biology. |
| PLO10 | acquire the foundation of entrepreneurial knowledge and mindset for career development by identifying opportunities and solutions particularly in the context of Environmental Biology. |
| PLO11 | consistently apply and uphold ethical principles, integrity, and professional values in understanding, evaluating, and conducting scientific practices within the field of Environmental Biology. |

**Required core courses**

| Course Code | Course Title | Semester | Course Prerequisite | |
|---|---|---|---|---|
| **Required Core - Level 200 = 12 Units** | | | | |
| BST211/3 | Limnology and Oceanography | 1 | BOI102/3<br>BOI107/2 | (S)<br>(S) |
| BST212/3 | Tropical Ecosystem | 1 | BOI102/3<br>BOI107/2 | (S)<br>(S) |
| BST223/3 | Population and Community Ecology | 2 | BOI102/3 | (S) |
| BST224/3 | Environmental Pollution | 2 | BOI102/3 | (S) |
| **Required Core - Level 300 = 17 Units** | | | | |
| BST300/8<br>or<br>*BOE300/4 | Research Project in Environmental Biology<br>Critical Review in Biology | 1 & 2<br><br>1 & 2 | Must have achieved: -<br>i. Total overall unit = 45-77 units<br>ii. Total unit for Biology course 39 – 54 units | |
| BST315/3 | Invasive Species and Biosecurity | 1 | BOI102/3<br>BOI107/2 | (S)<br>(S) |
| BST326/3 | Environmental Management | 2 | BST224/3 | (S) |
| BST327/3 | Climate Change in the Tropics | 2 | BOI102/3 | (S) |
| **Required Core - Level 400 = 7 Units** | | | | |
| BST418/4 | Sustainable Aquaculture | 1 | BOI102/3 | (S) |
| BST419/3 | Sustainable Management of Natural Resources | 1 | BOI102/3<br>BST212/3 | (S)<br>(S) |
| * Requires 4 more units from Elective courses | | | | |
| **Elective = 33 Units** | | | | |
| BDE311/3 | Ichthyology | 1 | BOI101/3 | (S) |
| BDE312/3 | Fisheries Management | 2 | BDE311/3 | (S) |
| BDE411/3 | Wildlife Conservation and Management | 1 | BST223/3 | (S) |
| BET211/4 | Introductory Parasitology | 1 | BOI101/3 | (S) |
| BGT213/3 | Soil Science and Environment | 1 | BOI102/3 | (S) |
| BSE311/3 | Introduction to Geographical Information | 1 | BOI102/3<br>BST212/3 | (S)<br>(S) |
| BOE101/3 | Biological Instrumentation | 1 & 2 | BOI103/4 | (S) |
| BOE202/3 | Introduction to Bioinformatic | 1 & 2 | BOI104/3 | (S) |
| BOE203/3 | Microscopy and Histological Techniques | 1 & 2 | | |
| BOE311/2 | Scientific Communications | 1 & 2 | | |
| BGE416/3 | Biology of Vertebrate Pest Animals | 1 | BOI101/3 | (S) |
| BET223/3 | Insect Ecology | 2 | BOI101/3 | (S) |
| BMT315/3 | Environmental Microbiology | 1 | BOI106/3 | (S) |
| Students can choose elective courses from: -<br>i. Major package (33 units); or<br>ii. Major package (17 units) and courses other than major package (16 units); or<br>iii. Major package (17 units) and package courses from other school subjects to prerequisite requirement (16 units). | | | | |

(S) = Course must be taken in sequential order.

(C) = Course must be taken concurrently.

**Proposed Curriculum Structure, Bachelor of Applied Science in Agrobiology / Biotechnology / Entomology and Parasitology / Environmental Biology with Honours**

| Year | Sem | Required Core (36-39 units) | | | | Elective & Open Elective (33 units) | | University (18 units) | Total Units |
|---|---|---|---|---|---|---|---|---|---|
| | | Agrobiology (39 units) | Biotechnology (38 units) | Entomology & Parasitology (38 units) | Environmental Biology (36 units) | | | | |
| 1 | 1 | BOI 104/4<br>BOI 105/4<br>BOI 106/3<br>KOT 122/4 | BOI 104/4<br>BOI 105/4<br>BOI 106/3<br>KOT 122/4 | BOI 101/3<br>BOI 102/3<br>BOI 103/4<br>BOI 107/2<br>KOT122/4 | BOI 101/3<br>BOI 102/3<br>BOI 103/4<br>BOI 107/2<br>KOT122/4 | ELECTIVE | OPEN ELECTIVE | WUS101/2 *(Local student)*<br>SHE103E/2 *(International student)* | 18 - 20 |
| | 2 | BOI 101/3<br>BOI 102/3<br>BOI 103/4<br>BOI 107/2 | BOI 101/3<br>BOI 102/3<br>BOI 103/4<br>BOI 107/2 | BOI 104/4<br>BOI 105/4<br>BOI 106/3 | BOI 104/4<br>BOI 105/4<br>BOI 106/3 | | | WAR/2122/2<br>SHE102/2 *(Local student)*<br>SHE104E/2<br>WAR123E/2 *(International student)* | 16 - 18 |
| 2 | 1 | BET 212/4<br>BGT 211/3<br>BGT 212/2<br>BGT 213/3 | BMT 210/3<br>BTT 211/3 | BET 211/4<br>BET 212/4 | BST 211/3<br>BST 212/3 | | | HFF226/2 *(Local student)*<br>LKM100/2 *(International student)*<br>Co-Curriculum/ Option /Language subject (1-2 unit) | 17 - 18 |
| | 2 | BDT 204/3<br>BDT 212/4 | BMT 223/3<br>BDT 204/3 | BET 223/3<br>BET 224/3 | BST 223/3<br>BST 224/3 | | | ENGLISH/2 *(Local student)*<br>LKM100/2 *(International student)*<br>Co-Curriculum/ Option /Language subject (1-2 unit) | 16 |
| 3 | 1 | BGT 300/4<br>BGT 314/4 | BTT 300/4<br>BTT 312/3<br>BTT 313/3 | BET 300/4<br>BET 326/3 | BST 300/4<br>BST 315/3 | | | LKM400/2 *(Local student)*<br>Co-Curriculum/ Option /Language subject (1-2 unit)<br>Co-Curriculum/ Option /Language subject (1-2 unit) | 17 - 16 |
| | 2 | BGT 300/4<br>BGT 325/3 | BTT 300/4<br>BMT 326/3<br>BTT 324/3 | BET 300/4<br>BET 315/4<br>BET 327/3 | BST 300/4<br>BST 326/3<br>BST 327/3 | | | ENGLISH/2 *(International student)*<br>Co-Curriculum/ Option /Language subject (1-2 unit)<br>Co-Curriculum/ Option /Language subject (1-2 unit) | 15 – 16 |
| 4 | 1 | BGT 416/3<br>BGT 417/2 | BTT 415/3<br>BTT 416/3 | BET 418/3<br>BET 419/3 | BST 418/4<br>BST 419/3 | | | Co-Curriculum/ Option /Language subject (1-2 unit)<br>Co-Curriculum/ Option /Language subject (1-2 unit) | 15 – 16 |
| | 2 | BOI420/12 | BOI420/12 | BOI420/12 | BOI420/12 | | | | 12 |
| **TOTAL** | | **78** | **77** | **77** | **75** | **17** | **16** | **18** | |



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