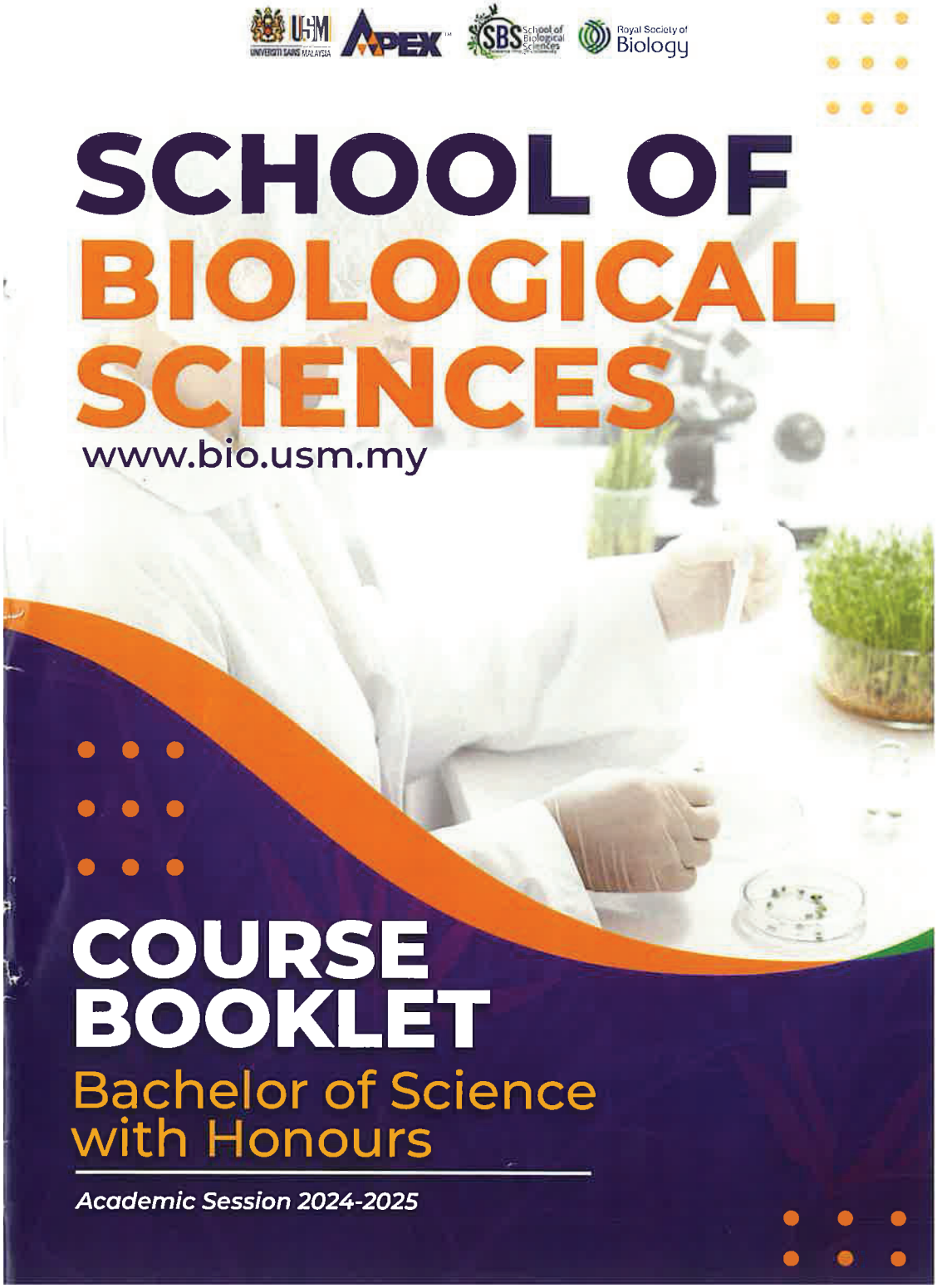
SCHOOL OF BIOLOGICAL SCIENCES

www.bio.usm.my



COURSE BOOKLET

Bachelor of Science with Honours

Academic Session 2024-2025

Introduction

Excellence in research and teaching is our aspiration, which is driven by research-active staff from diverse academic and research backgrounds. We offer exciting opportunities to students over a wide variety of topics related to Biological Sciences. Students are exposed to essential fundamental knowledge on the ecosystem, biodiversity, plants, animals, microbial and cellular processes in the first year. Towards the end of the first year, students can choose to specialise in either Microbiology or Animal and Plant Biodiversity leading to a Bachelor of Science (Honours) (Biology) degree in four (4) years. Students are also required to take an internship programme in the last semester of their 4th year. These six (6) months internship programme will provide students with valuable industry and corporate exposures.

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

1. The diversity of life forms and the reasons for this.
2. The intricate relationships between life forms and their environments.
3. Role of all life forms in maintaining the delicate balance of our ecosystem.
4. Good Laboratory Practices and usage of common and advanced laboratory equipment.
5. Ability to design and implement scientific experiments.
6. Ability to write reports and make scientific presentations.

The knowledge acquired by the students will enable them to make wise decisions with respect to the current global environmental issues such as pollution, environmental deterioration, biodiversity loss, deforestation, global warming and climate change. In addition, the students also develop innovative skills and are able to generate and test new ideas. Students with this essential knowledge will excel in any career path that they choose. The School of Biological Sciences is proud to produce students who can think holistically to ensure a sustainable tomorrow.

Our programmes are recognised internationally by the Royal Society of Biology, United Kingdom (https://www.rsb.org.uk/) starting from the Academic Session of 2019/2020 to 2023/2024.

Bachelor of Science in Microbiology / Animal and Plant Biodiversity with Honours

There are two (2) areas of specialisation/major:-



Microbiology: The Microbiology programme is designed to equip students with knowledge on metabolism, growth, genetics, regulation in microorganisms and the various situation where microorganisms are important to humans and other life forms. In the early part of the programme, courses offered will focus on the microbial world, mainly bacteria, fungi, yeast and viruses. Topics will cover the history of the development microbiological, the status of microorganisms in the world of living things and the diversity of microorganisms based on their morphology, fine structures, physiology, biochemistry and growth. Topics including basic methods in the maintenance of microorganisms, cultivation, isolation, enumeration and methods in sterilisation will also be part of the programme.

Subsequently, students will be exposed in detail on various groups of microorganisms and immunology. This will then be followed by discussion on microbial classification and aspects related to microbial physiology, biochemistry and genetics. The characteristics of antigens and human immunological response systems will also be part of the immunology course. Students will also be exposed to several applied courses in microbiology which will enable them to understand the role of microorganisms in the field of industrial & food microbiology, agriculture, medicine and environment.

Curriculum and Graduation Structure

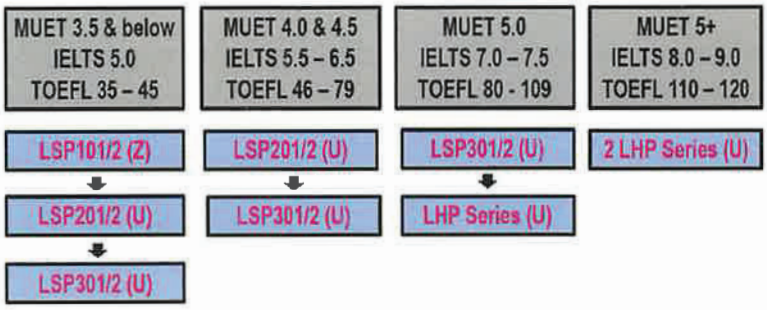
To qualify for the Bachelor of Science in Microbiology / Animal and Plant Biodiversity with Honours students are required to fulfil the following requirements:

1. Accumulate a total of **128** 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 the University courses.

Course Component		Course Code	Units
CORE	Basic • 39 units	T	77
	Required • 38 units		
ELECTIVE		E	33
UNIVERSITY		U	18
		TOTAL	128

*Note:

The English courses reouired are based on MUET/IELTS/TOEFL results Please refer to the list of courses below-



Required Core courses (38 units)

Required Core Courses are those courses offered at Levels 200, 300, and 400 that have been identified according to each specialisation programme, namely **Microbiology, Animal and Plant Biodiversity.** Students must enrol in all 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 Manager.

b. ANIMAL AND PLANT BIODIVERSITY

Course code	Course title	Semester	Course prerequisite	
Required Core - Level 200 = 17 Units				
BDT 204/3	Plant Tissue Culture	2	BOI 101/3	(S)
BDT 211/3	Plant Taxonomy and Phylogenetics	1	BOI 101/3	(S)
BDT 212/4	Plant Physiology and Development	2	BOI 101/3	(S)
BDT 223/4	Invertebrate and Vertebrate Zoology	1	BOI 101/3	(S)
BDT 225/3	Principles of Animal Behaviour	2	BOI 101/3	(S)
Required Core - Level 300 = 15 Units				
BDT 300/8 or *BOE 300/4	Research Project in Animal and Plant Biodiversity Critical Review in Biology	1 & 2 1 & 2	Must have achieved:- i. Total overall unit = 45-77 units ii. Total unit for Biology courses = 39-54 units	
BDT 316/3	Animal Physiology and Development	1	BOI 101/3	(S)
BDT 327/4	Genetics and Genomics of Plants and Animals	2	BOI 101/3 BOI 104/4	(S) (S)
Required Core - Level 400 = 6 Units				
BDT 418/3	Economic Botany	1	BOI 101/3	(S)
BDT 419/3	Principles of Plant - Animal Interaction	1	BOI 101/3	(S)
* requires 4 more units from Elective courses				
Elective = 33 units				
BDE 311/3	Ichthyology	1	BOI 101/3	(S)
BDE 312/3	Fisheries Management	2	BDE 311/3	(S)
BDE 411/3	Wildlife Conservation and Management	1	BST 223/3	(S)
BSE 311/3	Introduction to Geographical Information	1	BOI 102/3 BST 212/3	(S) (S)
BST 212/3	Tropical Ecosystem	1	BOI 102/3 BOI 107/2	(S) (S)
BST 223/3	Population and Community Ecology	2	BOI 102/3	(S)
BST 315/3	Invasive Species and Biosecurity	1	BOI 107/2 BOI 102/3	(S) (S)
BTE 321/2	Animal Cell Culture Technology	2	BOI 103/4	(S)
BOE 101/3	Biological Instrumentation	1 & 2		
BOE 203/3	Microscopy and Histological Techniques	1 & 2		
BOE 202/3	Introduction to Bioinformatics	1 & 2	BOI 104/3	(S)
BOE 311/2	Scientific Communications	1		

Student can choose elective courses from: -

i. Major package (33 units); or
ii. Major package (17 units) and courses other than major package (16 units); or
iii. Major package (17 units) and courses other than major package and /or course from other school subject to prerequisite requirement (16 units).

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