Major Title	Major in Biological Sciences (Intensive)
Offered to students admitted to Year 1 in	**2020**

Objectives:

This major is designed for students seeking a broad-based training in conventional and modern biology. Students are guided in a stimulating learning environment to explore major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The curriculum allows students to select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further exposed to three fundamental areas of biological sciences (genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology). Students are engaged in scientific learning through a wide range of laboratory and field work. They will acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major prepares graduates for employment as professionals in a variety of careers or for postgraduate study. The intensive major includes additional coursework and a compulsory capstone research project. It is designed for students with a strong desire to acquire knowledge with sufficient depth and breadth in biological sciences.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

PLO 1 : describe and explain the key concepts in genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology, and to appraise the related ethical and moral issues (by means of coursework, laboratory- and/or research-based learning in the curriculum)

PLO 2 : equip with sufficient knowledge in chemistry for application within a biological context (by means of coursework, laboratory- and/or research-based learning in the curriculum)

PLO 3 : analyze and interpret quantitative and qualitative biological data to provide scientifically based conclusions and/or judgements (by means of coursework, laboratory- and/or research-based learning in the curriculum)

PLO 4 : tackle biological research problems by formulating hypothesis and designing experimental investigations (by means of coursework, laboratory- and/or research-based learning in the curriculum)

PLO 5 : communicate effectively and professionally with scientists, educators, media, and general public in oral and written forms (by means of coursework, laboratory- and/or research-based learning, and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Biological Sciences
Major in Ecology & Biodiversity
Major in Ecology & Biodiversity (Intensive)
Major in Molecular Biology & Biotechnology
Major in Molecular Biology & Biotechnology (Intensive)

Required courses (144 credits)

1. Introductory level courses (60 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111	Scientific method and reasoning (6)	*(Note 1)*
SCNC1112	Fundamentals of modern science (6)	*(Note 1)*

Disciplinary Core Courses (48 credits)

BIOL1110	From molecules to cells (6)	*(Note 1)*
BIOL1309	Evolutionary diversity (6)	*(Note 1)*
CHEM1042	General chemistry I (6)	
CHEM1043	General chemistry II (6)	
BIOL2102	Biostatistics (6)	*(Note 1)*
BIOL2103	Biological sciences laboratory course (6)	*(Note 1)*
BIOL2220	Principles of biochemistry (6)	*Take either BIOL2220 or BIOC2600 to fulfill this 48 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1)*
BIOL2306	Ecology and evolution (6)	*(Note 1)*
BIOC2600	Basic biochemistry (6)	*Take either BIOL2220 or BIOC2600 to fulfill this 48 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1)*

2. Advanced level courses (72 credits)

Disciplinary Electives (72 credits with at least 18 credits of Level 4XXX courses))

(A) Genetics, molecular and cell biology (at least 12 credits selected from area A)

BIOL3401	Molecular biology (6)
BIOL3402	Cell biology and cell technology (6)
BIOL3404	Protein structure and function (6)
BIOL3408	Genetics (6)
BIOL4416	Stem cells and regenerative biology (6)

BIOL4417	'Omics' and systems biology (6)

(B) Ecology, systematics and evolution (at least 12 credits selected from area B)

BIOL3301	Marine biology (6)
BIOL3302	Systematics and phylogenetics (6)
BIOL3303	Conservation biology (6)
BIOL3319	Tropical terrestrial ecology (6)
BIOL3506	Evolutionary biology (6)
BIOL4302	Environmental impact assessment (6)

(C) Physiology and organismic biology (at least 18 credits with 6 credits from each of List I, II & III)

List I

BIOL3101	Animal behaviour (6)
BIOL3105	Animal physiology and environmental adaptation (6)
BIOL3205	Human physiology (6)
BIOL3403	Immunology (6)
BIOL3406	Reproduction and reproductive biotechnology (6)
BIOL3503	Endocrinology: human physiology II (6)

List II

BIOL3314	Plant structure and evolution (6)
ENVS3202	Plant physiology and climate change (6)
BIOL4411	Plant and food biotechnology (6)

List III

BIOL3109	Environmental microbiology (6)
BIOL3203	Food microbiology (6)
BIOL3508	Microbial physiology and biotechnology (6)
BIOL4401	Medical microbiology and applied immunology (6)

3. Capstone requirement (12 credits)

BIOL4994	Biological sciences project (12)

Notes:

1. These are core courses in the regular Biological Sciences Major (96 credits) curriculum.

2. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.