



Biological Sciences Intensive Major

Accredited by RSB since Sept 2019

Deputy major coordinator:

Prof Gary Ying Wai Chan, Assistant Professor



Objectives:

- Provide **broad-based yet in depth training** in conventional and modern biology
- Provide a **stimulating learning environment** to explore major biological systems at different levels of biological organization
- Emphasize **core concepts and applied aspects** in biological sciences
- Provide **a wide spectrum of elective courses in a framework**
- Engage students in scientific learning through a wide range of **laboratory and field work**
- Acquire valuable **transferable skills in analysis, organization and communication**

Intensive major structure

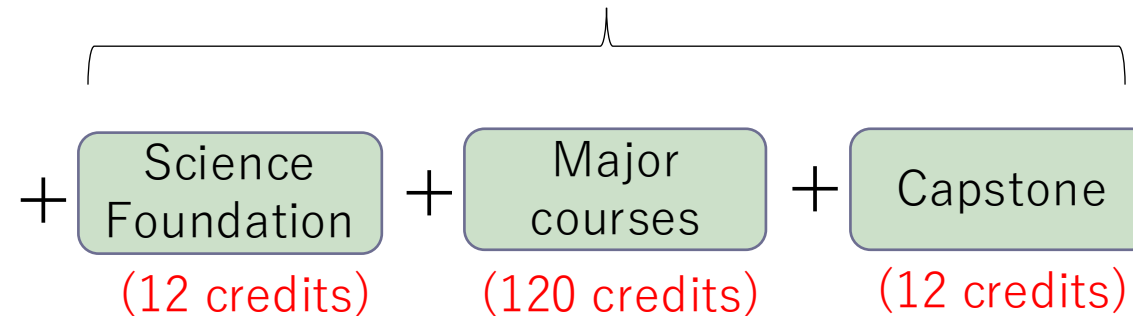
Curriculum Structure for BSc (Intensive Majors) (240 Credits) ~6 credits/course

Spanning over 4 years of full-time study

UNIVERSITY EDUCATION		INTENSIVE SCIENCE MAJOR		MINORS / ELECTIVES
Language Courses Common Core Courses (54 credits) 22.5%	+	Science Foundation Courses Disciplinary Courses Capstone Course (144-150 credits)	+	MINORS / ELECTIVES (36-42 credits) 17.5%

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TOP

Bio Sci Intensive Major: 144 credits (60%)



Each student takes ~10 courses per year

Major in Biological Sciences (Intensive)

Requirement: 144 credits

- 1. Introductory Courses (60 credits)**
- 2. Advanced level courses (72 credits)**
- 3. Capstone requirement (12 credits)**

Major in Biological Sciences (Intensive)

1. Introductory Courses (60 credits)

Science Foundation Courses (12 credits)

- SCNC1111 Scientific method and reasoning
- SCNC1112 Fundamentals of modern science

Disciplinary Courses (48 credits)

- BIOL1110 From molecules to cells
- BIOL1309 Evolutionary diversity (with field work)
- CHEM1042 General chemistry I
- CHEM1043 General chemistry II
- BIOL2102 Biostatistics
- BIOL2103 Biological sciences laboratory course (with labs)
- BIOL2220 Principles of biochemistry (with labs) (or BIOC2600 Basic Biochemistry)
- BIOL2306 Ecology and evolution (with field work)

Major in Biological Sciences (Intensive)

2. Advanced level courses

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

3 disciplinary areas:

- A. Genetics, molecular and cell biology,
- B. Ecology, systematics and evolution
- c. Physiology and organismic biology

A. Genetics, Molecular & Cell biology (at least 2 courses/12 credits)

BIOL3401	Molecular biology (6) (with labs)
BIOL3402	Cell biology and cell technology (6) (with labs)
BIOL3404	Protein structure and function (6)
BIOL3408	Genetics (6) (with labs)
BIOL4416	Stem cells and regenerative biology (6) (with labs)
BIOL4417	'Omics' and systems biology (6) (with labs)

B. Ecology, Systematics and Evolution (at least 2 courses/12 credits)

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

C. Physiology and Organismic Biology (at least one course from each list)

List I (Animal/Human)

- BIOL3101 Animal behaviour (6) **(with labs)**
- BIOL3105 Animal physiology and environmental adaptation (6)
- BIOL3205 Human physiology (6)
- BIOL3403 Immunology (6) **(with labs)**
- BIOL3416 Developmental Biology(6) **(with labs)**
- BIOL3503 Endocrinology: human physiology II (6) **(with labs)**

List II (Plant)

- BIOL3414 Plant stress biology and climate change (6)
- ENVS3202 Plant ecophysiology and climate change (6) **(with labs)**
- BIOL4411 Plant and food biotechnology (6) **(with labs)**

List III (Microbiology)

- BIOL3109 Environmental microbiology (6)
- BIOL3203 Food microbiology (6) **(with labs)**
- BIOL3218 Global food safety (6)
- BIOL3508 Microbial physiology and biotechnology (6) **(with labs)**
- BIOL4401 Medical microbiology and applied immunology (6) **(with labs)**

Major in Biological Sciences (Intensive)

3. Capstone requirement (12 credits)

BIOL4994 Biological sciences project (12 credits) – Year long

[Pre-requisites: Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Biological Sciences Major]

(usually in Year 3 2nd semester, summer or Year 4)

Research Areas for FYP (BIOL4994)



Ecology and Biodiversity



Molecular and Cell Biology



<https://www.biosch.hku.hk/about-us/our-staff/>

Read about 40 faculty members' research & potential FYP

Facilities

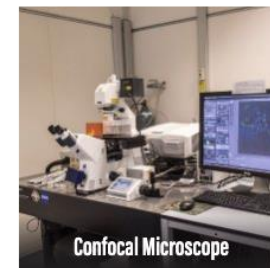
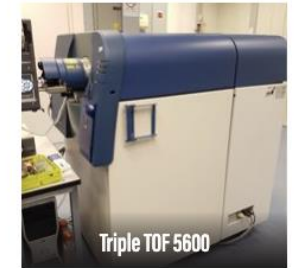
Specialized Laboratory / Room



Equipment

Major Equipments

Visit
Equipment Booking System
for details



Curriculum for Major in Biological Sciences (non intensive)

Category	Courses	No. of credits	%
University Education	University Education	54	22.5
Major	Biological Sciences	96	40
Electives	Free choices or courses leading to a 2 nd major or minor (s)	90	37.5
Total		240	100

- A student usually takes 10 courses (6 credits/course) each year

Major in Biological Sciences (non intensive)

Requirement: 96 credits

- 1. Introductory Courses (48 credits)**
- 2. Advanced level courses (42 credits)**
- 3. Capstone requirement (6 credits)**

Major in Biological Sciences (non intensive)

1. Introductory Courses (48 credits)

Science Foundation Courses (12 credits)

- SCNC1111 Scientific method and reasoning
- SCNC1112 Fundamentals of modern science

Disciplinary Courses (36 credits)

- BIOL1110 From molecules to cells
- BIOL1309 Evolutionary diversity
- BIOL2102 Biostatistics
- BIOL2103 Biological sciences laboratory course
- BIOL2220 Principles of biochemistry (or BIOC2600)
- BIOL2306 Ecology and evolution

Major in Biological Sciences (non intensive)

2. Advanced level courses (42 credits)

STUDENTS WILL GAIN EXPOSURE AND TRAINING IN
THREE DISCIPLINARY AREAS:

- A. GENETICS, MOLECULAR & CELL BIOLOGY,
- B. ECOLOGY, SYSTEMATICS, AND EVOLUTION
- C. PHYSIOLOGY AND ORGANISMIC BIOLOGY

A. Genetics, Molecular & Cell biology (at least 2 courses/12 credits)

- BIOL3401 Molecular biology (6)**
- BIOL3402 Cell biology and cell technology (6)**
- BIOL3404 Protein structure and function (6)**
- BIOL3408 Genetics (6)**

B. Ecology, Systematics and Evolution (at least 2 courses/12 credits)

- BIOL3301 Marine biology (6)**
- BIOL3302 Systematics and phylogenetics (6)**
- BIOL3303 Conservation ecology (6)**
- BIOL3319 Tropical terrestrial ecology (6)**
- BIOL3506 Evolutionary biology (6)**

C. Physiology and Organismic Biology

(at least one course/6 credits from each list)

List I

- | | |
|-----------------|---------------------------------|
| BIOL3105 | Animal physiology (6) |
| BIOL3205 | Human physiology (6) |
| BIOL3403 | Immunology (6) |
| BIOL3416 | Developmental Biology(6) |
| BIOL3503 | Endocrinology (6) |

List II

- | | |
|-----------------|--|
| BIOL3414 | Plant stress biology and climate change (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) |

Major in Biological Sciences (non intensive)

3. Capstone requirement (6 credits)

[Pre-requisites: Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Biological Sciences Major] (usually by Year 3 2nd semester, summer or Year 4)

One of the following courses:

BIOL3994 Directed studies in biological sciences (6 credits)

BIOL4964 Biological sciences internship (6 credits)

BIOL4994 Biological sciences project (12 credits)

BIOL4964 Biological sciences internship

- At least **160 hours** valuable workplace training

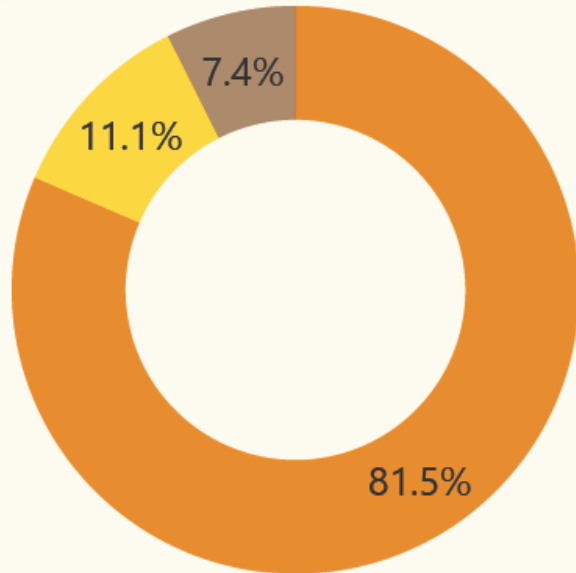
Institutions, organizations and companies offering internship for Major in Biological Sciences in recent years:

- HKU:
 - School of Biological Sciences,
 - School of Biomedical Sciences, Faculty of Medicine,
 - Department of Psychology
- National University of Singapore, Acoustic Research Lab
- Al-Farabi Kazakh National University
- HKSAR Government
 - Agriculture, Fisheries and Conservation Department
 - Leisure and Cultural Services Department
- Prince of Wales Hospital, Department of Obstetrics and Gynaecology
- Ocean Park Hong Kong
- World Wide Fund Hong Kong
- Ecosystems Limited
- Au Law Organic Farm
- Geb Impact Technology Company Ltd
- Tai Pan Bread and Cakes
- Bright Future Pharmaceutical Laboratories
- Avalon Biomedical (Management) Co. Ltd

Learning Outcomes:

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**
2. Equip with sufficient knowledge in **chemistry** for application within a biological context
3. Analyze and interpret **quantitative and qualitative biological data** to provide scientifically based conclusions and/or judgements
4. Tackle biological research problems by **formulating hypothesis and designing experimental investigations**
5. **Communicate effectively and professionally** with scientists, educators, media, and general public in oral and written forms

Statistics on Biological Sciences (major/intensive) graduates



- Employed
- Further Studies
- Not seeking employment

BSc - Biological Sciences

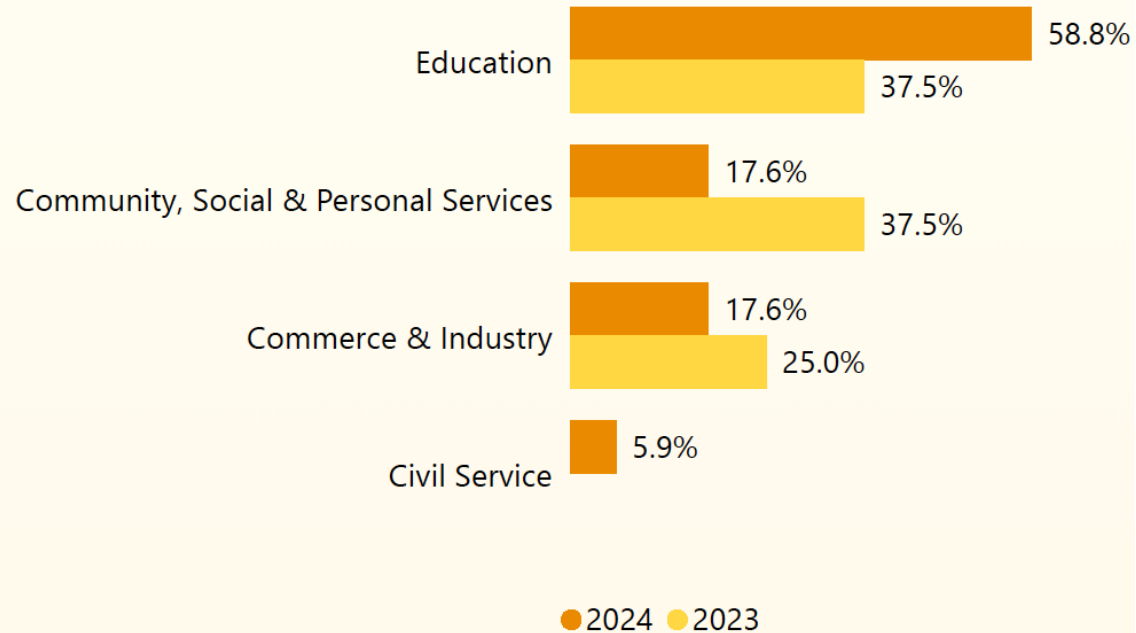
Year	2024		2023	
Employment Situation	No.	%	No.	%
Employed	22	81.5%	10	66.7%
Further Studies	3	11.1%	4	26.7%
Not seeking employment	2	7.4%	1	6.7%
No. of respondent	27	100.0%	15	100.0%

HKU Overall*

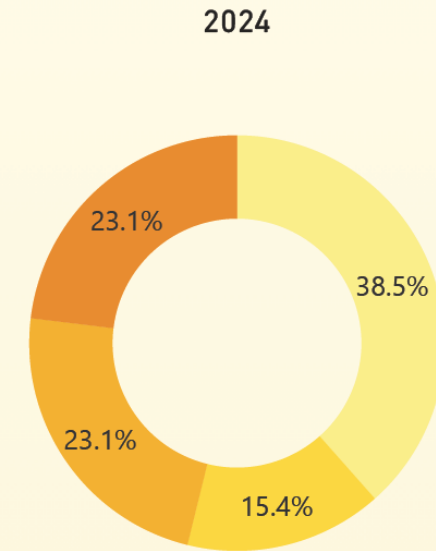
Year	2024		2023	
Employment Situation	No.	%	No.	%
Employed	2272	72.6%	2260	73.7%
Unemployed	29	0.9%	28	0.9%
Further Studies	696	22.2%	693	22.6%
Emigrated / Returned to home country	34	1.1%	28	0.9%
Not seeking employment	98	3.1%	56	1.8%
No. of respondent	3129	100.0%	3065	100.0%

Employment information

Employment Sector



Job Relevancy



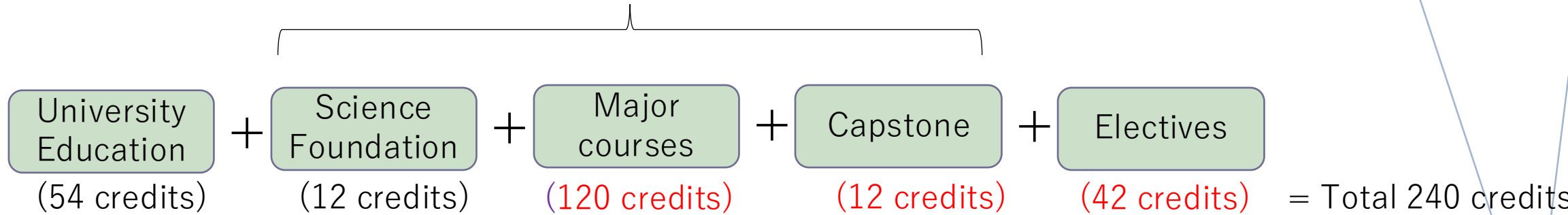
● Closed related ● Partially related - only job nature ● Partially related - only industry ● Not related at all

Major in Biological Sciences (Intensive)

22.5%

Intensive Major: 144 credits (60%)

17.5%

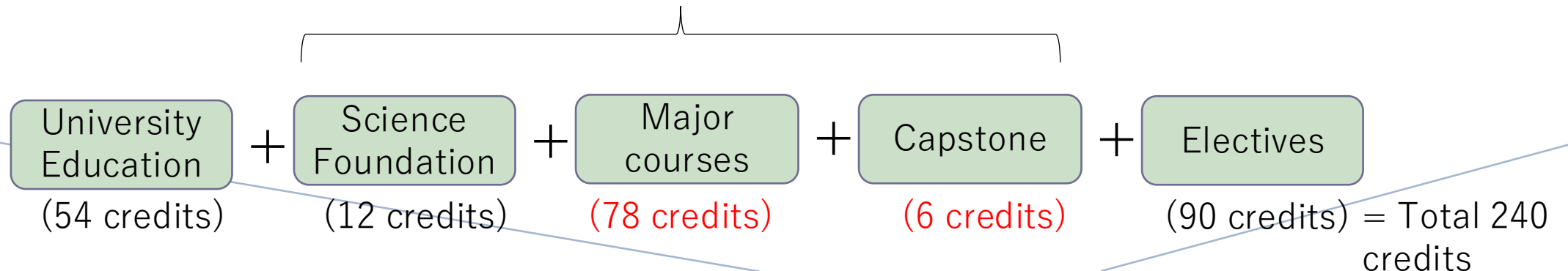


Major in Biological Sciences

22.5%

Bio Sci Major: 96 credits (40%)

37.5%

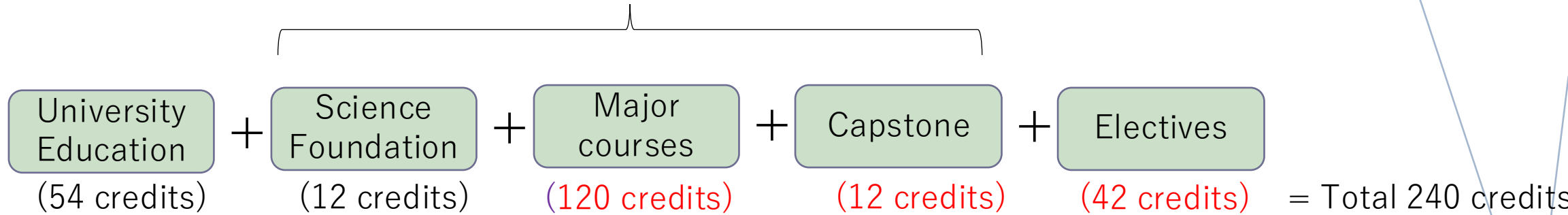


Major in Biological Sciences (Intensive)

22.5%

Intensive Major: 144 credits (60%)

17.5%



Key features of the intensive major:

- Two additional introductory level courses: CHEM1042 and CHEM1043 (General Chemistry I & II)
- Five additional advanced level courses
- More disciplinary electives available for selection:
 - BIOL4416 Stem cells and regenerative biology
 - BIOL4417 Omics and systems biology
 - BIOL4302 Environmental impact assessment
 - BIOL3101 Animal behavior
- Capstone requirement: BIOL4994 Biological Sciences Project (12 credits)
- Accreditation by the Royal Society of Biology (UK) since 2019

- RSB accreditation/intensive major
- Doctor of Veterinary Medicine (DVM) at University of Melbourne (UoMelb): Please note, SBS students are eligible to apply for DVM
- Science Master Class: BS(Intensive): committed to the BScMRes
- Exchange programme: students can apply for exchange programme (Worldwide Exchange <https://intlaffairs.hku.hk/hku-worldwide-student-exchange> for one semester in Y3 & Y4 OR Faculty Exchange <https://www.scifac.hku.hk/current/ug/el/exchange>)