



Biological Sciences Intensive Major

Accredited by RSB since Sept 2019

Major coordinator: Dr. Moriaki Yasuhara, Associate Professor

Deputy major coordinator: Dr. Gary 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

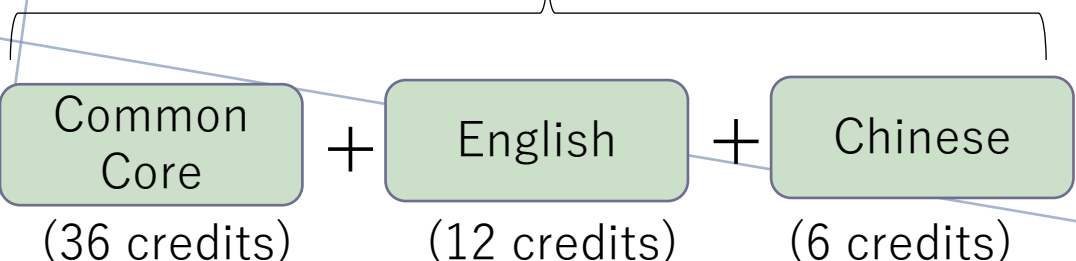
Curriculum Structure for BSc (Intensive Majors) (240 Credits) ~6 credits/course

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%

Bio Sci Intensive Major: 144 credits (60%)

TOP



Each student takes ~10 courses per year

Major in Biological Sciences (Intensive)

Requirement: 144 credits

- 1. Introductory Courses (60 credits)**
- 2. Advanced level courses (42 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)

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)**
- BIOL3406 Reproduction and reproductive biotechnology (6) **(with labs)**
- BIOL3503 Endocrinology: human physiology II (6) **(with labs)**

List II (Plant)

- BIOL3314 Plant structure and evolution (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 Food hygiene and quality control (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

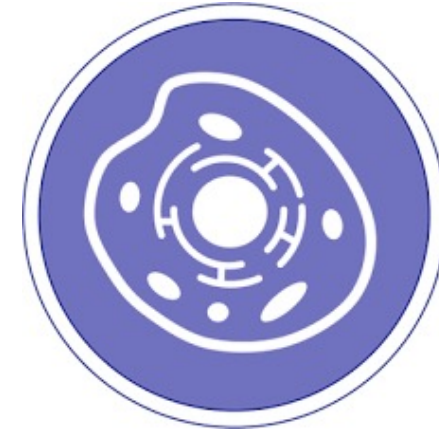
[Pre-requisites: Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Biological Sciences Major]

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

Research Areas for FYP (BIOL4994)



Ecology and Biodiversity



Molecular and Cell Biology

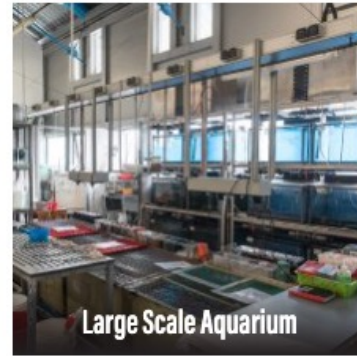


<https://www.biosch.hku.hk/about-us/our-staff/>

Read about 47 faculty members' research & potential FYP

Facilities

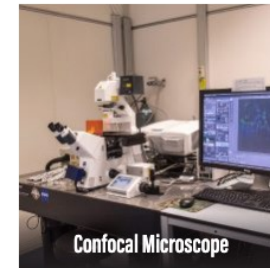
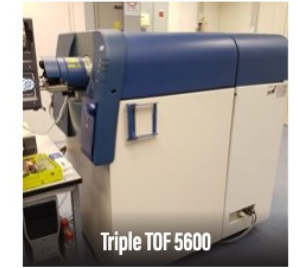
Specialized
Laboratory / Room



Equipment

Major Equipments

Visit
Equipment Booking System
for details



Curriculum for Major in Biological Sciences (non intensive)

Category	Courses	No. of credits	%
University Education	Common core English Chinese	36 12 6	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)**
- BIOL3406 Reproduction and reproductive biotechnology (6)**
- BIOL3503 Endocrinology (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)**

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

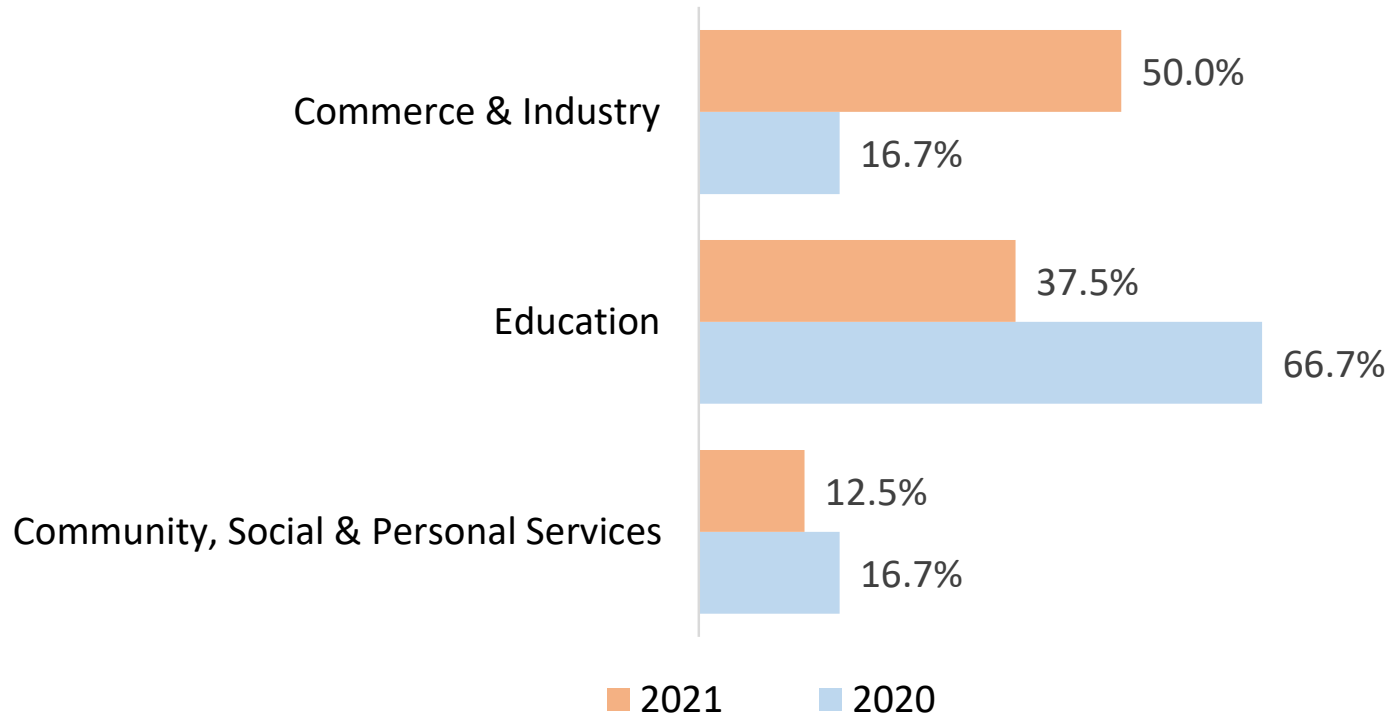
Statistics on graduates (all Biological Sciences major/intensive)

	Biological Sciences				HKU Overall*			
	2021		2020		2021		2020	
No. of graduate	19		14		3856		3662	
No. of respondent	18		12		3387		3219	
Response rate	94.7%		85.7%		87.8%		87.9%	
	No.	%	No.	%	No.	%	No.	%
Employed	10	55.6%	6	50.0%	2476	73.1%	2416	75.1%
Unemployed	-	-	1	8.3%	33	1.0%	32	1.0%
Further studies	6	33.3%	4	33.3%	724	21.4%	686	21.3%
Emigrated/Returned to home country	-	-	-	-	51	1.5%	38	1.2%
Not seeking employment	2	11.1%	1	8.3%	103	3.0%	47	1.5%

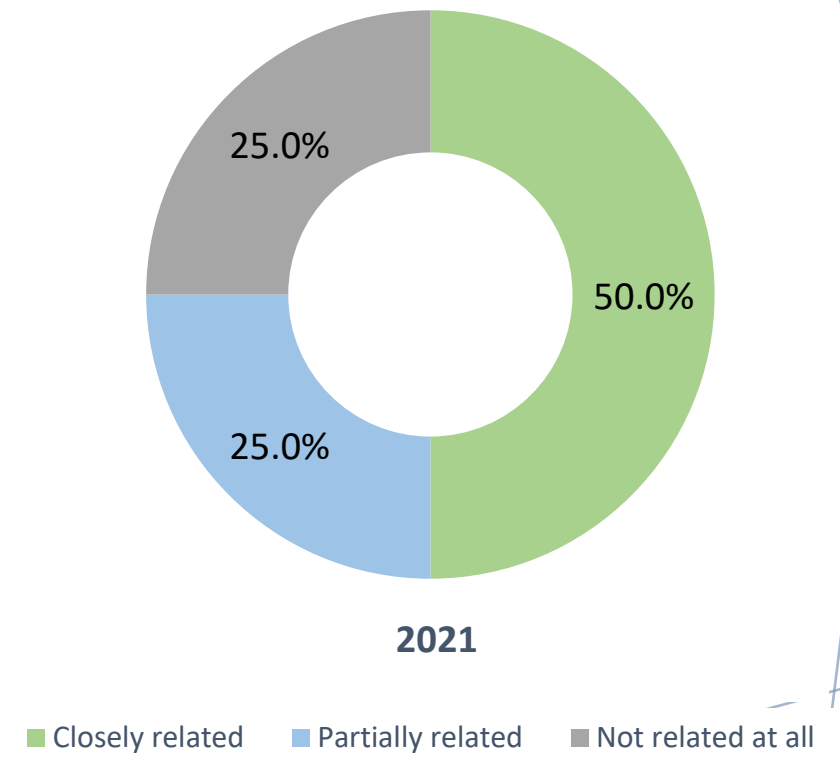
* HKU Overall refers to the related figures of total HKU population which includes MBBS and BDS graduates.

Employment information

Employment Sector



Job Relevancy

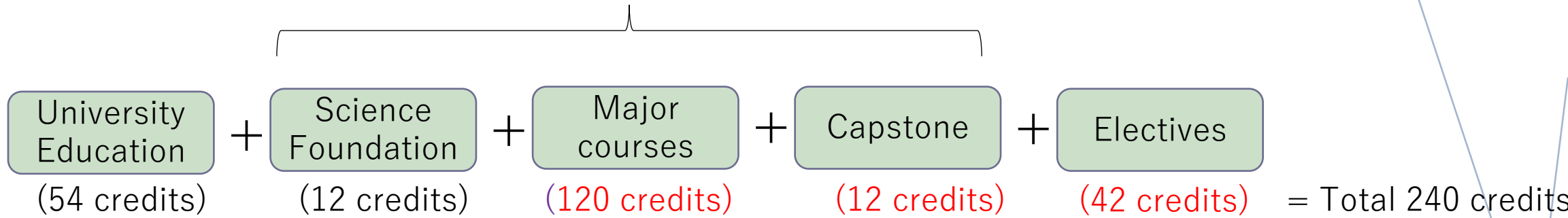


Major in Biological Sciences (Intensive)

22.5%

Intensive Major: 144 credits (60%)

17.5%

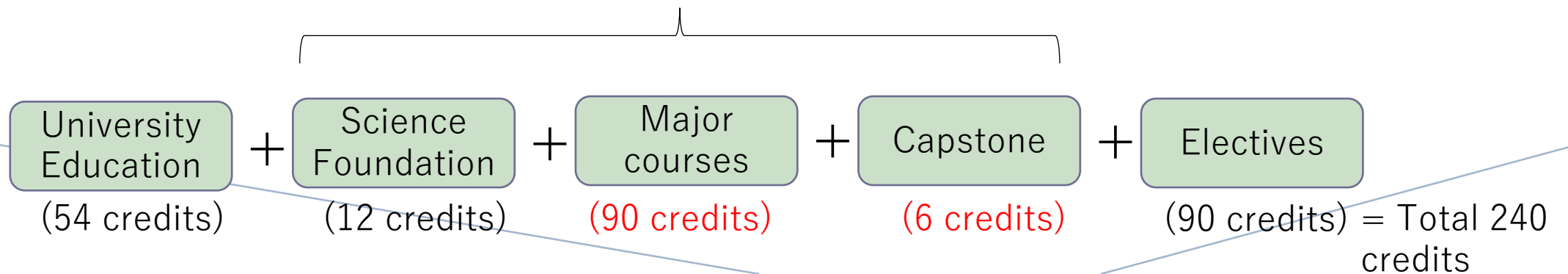


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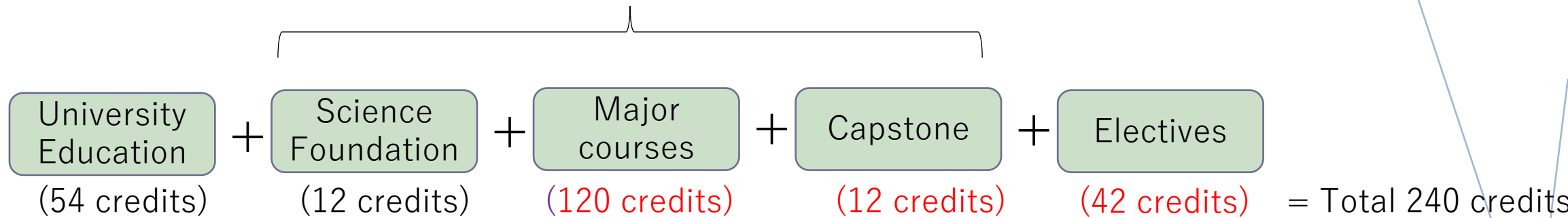


Major in Biological Sciences (Intensive)

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