

## Undergraduate Programs

The Department offers two undergraduate programs: a three-year program that leads to the BSc degree in Biochemistry, and a four-year joint program with the Hong Kong Institute of Education (HKIEd) that leads to the BSc degree in Biochemistry and Science Education.

**BSc in Biochemistry:** The objectives of the BSc program in Biochemistry are to instruct students in understanding biochemical molecules and processes and to provide training in the methodologies used in laboratory investigation. The program emphasizes both theory and experimentation.

**BSc in Biochemistry and Science Education:** This program aims at training students to become secondary teachers in A-level Biology or Chemistry and in Integrated Science. This four-year program is composed of a three-year program in biochemistry provided by the Hong Kong University of Science and Technology, and a one-year professional teacher education provided by HKIEd. Enrollment into this program is made at the end of the first year of study in the regular BSc in Biochemistry program. Program graduates will be granted Registered Teacher Status (RTS) by the Education and Manpower Bureau upon application. Interested students may also pursue postgraduate study and research in biochemistry and other biological sciences.

- [Curriculum for BSc in Biochemistry](#)
- [Curriculum for BSc in Biochemistry and Science Education](#)
- [Undergraduate Minor Program in Biochemistry](#)

## Curriculum for BSc in Biochemistry

### Major Program Requirements

#### Core courses

BICH	121	Introduction to Biochemistry	[3-0-0:3]
BICH	122	Intermediary Metabolism	[3-0-0:3]
BICH	172	Introductory Biochemical Laboratory	[0-0-6:2]
BICH	182	Biochemical Laboratory Techniques	[1-0-0:1]
BICH	201	Molecular and Cellular Biochemistry I	[3-0-0:3]
BICH	202	Molecular and Cellular Biochemistry II	[3-0-0:3]
BICH	211	Biochemistry of Nucleic Acids	[0-0-6:2]
BICH	221	Principles of Recombinant DNA Technology	[1-0-0:1]

#### Required courses

	BICH	323	Advanced Biochemical Laboratory Techniques	[1-0-0:1]
	BICH	333	Advanced Biochemical Laboratory	[0-0-8:2]
or	BICH	397	Biochemical Research I	[0-0-9:3]
	BICH	366	Biotechnology Seminar	[1-3-0:4]
or	BICH	398	Biochemical Research II	[1-0-9:4]
	BIOL	202	Animal Physiology	[3-0-0:3]
or	BIOL	206	Microbiology	[3-0-0:3]
	BIOL	211	General Genetics	[3-1-0:4]
	BISC	207	Introduction to Biophysics	[3-0-0:3]
or	BISC	215	Biostatistics	[2-1-0:3]
	CHEM	111	Organic Chemistry I	[3-1-0:4]
	CHEM	141	Analytical Chemistry	[3-0-0:3]
	CHEM	154	Organic Chemistry Laboratory	[0-1-3:2]
	CHEM	212	Organic Chemistry II	[3-0-0:3]
	COMP	101	Exploring Multimedia and Internet Computing	[2-0-2:3]
	MATH	005	Fundamental Mathematics	[3-1-0:4]
	MATH	051	Introduction to Differential Calculus	[1-1-0:1]
(1) or	MATH	006	Algebra and Calculus	[3-1-0:4]
or	MATH	001	Calculus I	[3-1-0:4]

#### Elective courses

Elective types		Minimum no. of courses	Minimum total credits
(2) BISC	Biological Science Elective	5	15
(3) FREE	Free Elective	3	9

### General Education Requirements

Electives must be selected from amongst those general education courses that are listed under the section "Designated General Education Courses".

Elective types		Minimum no. of courses	Minimum total credits
GEE(ENGG)	Engineering General Education Elective	1	6
GEE(SB&M)	Business and Management General Education Elective	1	
(4) GEE(H&SS)	Humanities and Social Science General Education Elective	4	12

### Required Courses in English Communication

LANG	108	English for Science Students	[0-2-0:1]
LANG	208	Technical Communication for Science Students I	[0-2-0:1]
LANG	209	Technical Communication for Science Students II	[0-2-0:1]
LANG	308	Technical Communication for Science Students III	[0-2-0:1]

### Other Requirement:

(5) HLTH	001	Healthy Life Style	[0 credit]
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#### Notes:

- (1) Students admitted with a grade D or above in either AL Pure Mathematics or AL Applied Mathematics will replace this course with an approved course in the School of Science or a free elective. Other students should elect one of MATH 001, MATH 006, or MATH 005 plus MATH 051 with respect to their prior mathematics background as follows:

<i>Prior mathematics background</i>	<i>Course to be elected</i>
Grade E in AL Pure Mathematics or AL Applied Mathematics; and/or a passing grade in HKCEE Additional Mathematics, AS Mathematics and Statistics, and/or AS Applied Mathematics	MATH 001
A passing grade in HKCEE Additional Mathematics; and without a passing grade in AL Pure Mathematics, AL/AS Applied Mathematics, or AS Mathematics and Statistics	MATH 006; or MATH 001
Grade B or above in HKCEE Mathematics; and/or a passing grade in HKCEE Additional Mathematics; and without a passing grade in AL Pure Mathematics, AL/AS Applied Mathematics, or AS Mathematics and Statistics	MATH 006
Grade C or below in HKCEE Mathematics; and without a passing grade in HKCEE Additional Mathematics, AL Pure Mathematics, AL/AS Applied Mathematics, or AS Mathematics and Statistics	MATH 005 (Fall) plus MATH 051 (Winter)

- (2) Students have to elect at least five courses from the following BISC courses: BISC 319/338/354/355/358/362/363/376/395 from Biochemistry and BISC 300/306/309/314/315/317/336 from Biology.
- (3) a) First year students may take BISC 105 as their free elective.  
 b) BIOL 222 and BIOL 226 are recommended electives.  
 c) 000- or 100- level biochemistry and biological science courses (BICH/BISC) taken in second or upper year cannot be used to fulfill the FREE elective requirement.
- (4) Of these courses, at least one course in Humanities and one in Social Science are required.
- (5) Students are required to take and pass this course in their first year of study. Details of the course and its requirements are announced on the course website <http://www.ab.ust.hk/sao/HLTH001> managed by the Student Affairs Office.

A minimum of 100 credits is required for the BSc program in Biochemistry. For students who are required to take MATH 005 and 051, the minimum total credits required is 101 credits.

### Recommended Pattern of Study for BSc in Biochemistry

1st year	Fall	C BICH 121 R CHEM 111, COMP 101, LANG 108, MATH 001/005^/006 O HLTH 001	(Total: 14 credits)
	Winter	R MATH 051#	(Total: 1 credit)
	Spring	C BICH 122, BICH 172, BICH 182 R CHEM 212, LANG 108 E GEE(ENGG), GEE(H&SS), FREE O HLTH 001	(Total: 19* credits)
2nd year	Fall	C BICH 201, BICH 211, BICH 221 R BIOL 211, BISC 207/BISC 215, CHEM 141, CHEM 154, LANG 208	(Total: 19 credits)
	Spring	C BICH 202 R BIOL 202/206, LANG 209 E GEE(SB&M), GEE(H&SS), FREE	(Total: 16 credits)
3rd year	Fall	R BICH 397 or BICH 323 & 333, LANG 308 E three BISC, GEE(H&SS)	(Total: 16 credits)
	Spring	R BICH 366/398 E two BISC, GEE(H&SS), FREE	(Total: 16 credits)

\* LANG 108 is a two-semester course. The course credit will be earned on completion of the course at the end of 1st year Spring.

^ Students who are required to take MATH 005 must take MATH 051 in 1st year Winter.

# Only for students who are required to take MATH 005.

C = core course; R = required course; E = elective course

## Curriculum for BSc in Biochemistry and Science Education

### Major Program Requirements

#### Core courses

BICH	121	Introduction to Biochemistry	[3-0-0:3]
BICH	122	Intermediary Metabolism	[3-0-0:3]
BICH	172	Introductory Biochemical Laboratory	[0-0-6:2]
BICH	182	Biochemical Laboratory Techniques	[1-0-0:1]
BICH	201	Molecular and Cellular Biochemistry I	[3-0-0:3]
BICH	202	Molecular and Cellular Biochemistry II	[3-0-0:3]
BICH	211	Biochemistry of Nucleic Acids	[0-0-6:2]
BICH	221	Principles of Recombinant DNA Technology	[1-0-0:1]

#### Required courses

	BICH	323	Advanced Biochemical Laboratory Techniques	[1-0-0:1]
	BICH	333	Advanced Biochemical Laboratory	[0-0-8:2]
or	BICH	398	Biochemical Research II	[1-0-9:4]
(1) or	BICH	366	Biotechnology Seminar	[1-3-0:4]
	BICH	397	Biochemical Research I	[0-0-9:3]
	BIOL	202	Animal Physiology	[3-0-0:3]
	BIOL	211	General Genetics	[3-1-0:4]
	BIOL	216	Ecology	[3-0-0:3]
or	BISC	207	Introduction to Biophysics	[3-0-0:3]
	BISC	215	Biostatistics	[2-1-0:3]
(2)	CHEM	101	Fundamentals of Organic Chemistry	[3-0-0:3]
	CHEM	102	Physical Chemistry: Fundamentals and Applications	[3-0-0:3]
	CHEM	131	Inorganic Chemistry I	[3-1-0:4]
	CHEM	141	Analytical Chemistry	[3-0-0:3]
	CHEM	154	Organic Chemistry Laboratory	[0-1-3:2]
	COMP	101	Exploring Multimedia and Internet Computing	[2-0-2:3]
	MATH	005	Fundamental Mathematics	[3-1-0:4]
	MATH	051	Introduction to Differential Calculus	[1-1-0:1]
(3) or	MATH	006	Algebra and Calculus	[3-1-0:4]
	MATH	001	Calculus I	[3-1-0:4]
(4)	PHYS	111	Physics I	[3-1-2:4]
	PHYS	112	Physics II	[2-0-3:3]
	SCED	213	Foundations and Processes of Learning	[3-0-0:3]
	SCED	214	Managing Diversity in the Classroom	[3-0-0:3]
	SCED	311	Philosophical and Sociological Perspectives in Education	[3-0-0:3]
	SCED	314	Curriculum and Assessment	[3-0-0:3]
	SCED	315	The Professional Teacher in Classroom, School and Community	[3-0-0:3]
	SCED	321	Foundations of Science Education	[3-0-0:3]
	SCED	322	Teaching and Learning Integrated and Applied Science	[3-0-0:3]
	SCED	323	Learning Science in the Community	[3-0-0:3]
	SCED	324	Science, Design and Technology, and Society	[3-0-0:3]
	SCED	325	Field Experience for Science Teaching (I)	[2 credits]
	SCED	326	Field Experience for Science Teaching (II)	[6 credits]
	SCED	331	Foundation Studies in the Teaching and Learning of Biology	[3-0-0:3]
or	SCED	341	Foundation Studies in the Teaching and Learning of Chemistry	[3-0-0:3]
	SCED	332	Advanced Studies in the Teaching and Learning of Biology	[3-0-0:3]
or	SCED	342	Advanced Studies in the Teaching and Learning of Chemistry	[3-0-0:3]

#### Elective courses

Elective types		Minimum no. of courses	Minimum total credits
(5) BISC	Biological Science Elective	2	6
(6) FREE	Free Elective	2	6

### General Education Requirements

Electives must be selected from amongst those general education courses that are listed under the section "Designated General Education Courses".

Elective types		Minimum no. of courses	Minimum total credits
GEE(ENGG)	Engineering General Education Elective	1	6
GEE(SB&M)	Business and Management General Education Elective	1	
(7) GEE(H&SS)	Humanities and Social Science General Education Elective	4	12

### Required Courses in English Communication

LANG 108	English for Science Students	[0-2-0:1]
LANG 208	Technical Communication for Science Students I	[0-2-0:1]
LANG 209	Technical Communication for Science Students II	[0-2-0:1]
LANG 308	Technical Communication for Science Students III	[0-2-0:1]

### Other Requirement:

(8) HLTH 001	Healthy Life Style	[0 credit]
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#### Notes:

- (1) Normally, students who elect BICH 366 will need to take BICH 323/333, and those who elect BICH 397 will be required to take BICH 398.
- (2) Students can replace CHEM 101 with CHEM 111 plus CHEM 212.
- (3) Students admitted with a grade D or above in either AL Pure Mathematics or AL Applied Mathematics will replace this course with an approved course in the School of Science or a free elective. Other students should elect one of MATH 001, MATH 006, or MATH 005 plus MATH 051 with respect to their prior mathematics background as follows:

<i>Prior mathematics background</i>	<i>Course to be elected</i>
Grade E in AL Pure Mathematics or AL Applied Mathematics; and/or a passing grade in HKCEE Additional Mathematics, AS Mathematics and Statistics, and/or AS Applied Mathematics	MATH 001
A passing grade in HKCEE Additional Mathematics; and without a passing grade in AL Pure Mathematics, AL/AS Applied Mathematics, or AS Mathematics and Statistics	MATH 006; or MATH 001
Grade B or above in HKCEE Mathematics; and/or a passing grade in HKCEE Additional Mathematics; and without a passing grade in AL Pure Mathematics, AL/AS Applied Mathematics, or AS Mathematics and Statistics	MATH 006
Grade C or below in HKCEE Mathematics; and without a passing grade in HKCEE Additional Mathematics, AL Pure Mathematics, AL/AS Applied Mathematics, or AS Mathematics and Statistics	MATH 005 (Fall) plus MATH 051 (Winter)

- (4) The pre-requisite of AS/AL Physics or AL Engineering Science will be waived. Students may take PHYS 002/007, plus PHYS 111/112/126 as replacement of PHYS 111 and PHYS 112.
- (5) Students have to elect at least two 300-level BISC courses. Students with satisfactory academic performance are encouraged to select one more 300-level BISC elective course in the Spring semester of Year 3 and also in the Fall semester of Year 4.
- (6) (a) BIOL 108 (Plant Biology) and BIOL 206 (Microbiology) are the recommended free electives, especially for those who choose Foundation Studies in the Teaching and Learning of Biology and Advanced Studies in the Teaching and Learning of Biology (to qualify for teaching AL Biology).  
(b) 000- or 100-level biochemistry and biological science course (BICH/BISC) taken in second or upper year of study cannot be used to fulfill the FREE elective requirement.
- (7) Of these courses, at least one course in Humanities and one in Social Science are required.
- (8) Students are required to take and pass this course in their first year of study. Details of the course and its requirements are announced on the course website <http://www.ab.ust.hk/sao/HLTH001> managed by the Student Affairs Office.

A minimum of 142 credits is required for the BSc program in Biochemistry and Science Education. For students who are required to take MATH 005 and 051, the minimum total credits required is 143 credits.

**Recommended Pattern of Study for BSc in Biochemistry and Science Education**

1st year	Fall	C BICH 121 R CHEM 101, CHEM 131, COMP 101, LANG 108, MATH 001/005^/006 O HLTH 001	(Total: 17 credits)
	Winter	R MATH 051#	(Total: 1 credit)
	Spring	C BICH 122, BICH 172, BICH 182 R LANG 108 E GEE(ENGG), GEE(H&SS), FREE O HLTH 001	(Total: 16* credits)
2nd year	Fall	C BICH 201, BICH 211, BICH 221 R PHYS 111, CHEM 102, CHEM 141, CHEM 154, LANG 208	(Total: 19 credits)
	Winter	R PHYS 112	(Total: 3 credits)
	Spring	C BICH 202 R BIOL 202, LANG 209, SCED 213, SCED 214 E GEE(SB&M), GEE(H&SS)	(Total: 19 credits)
3rd year	Fall	R SCED 311, SCED 321, SCED 323, SCED 324, SCED 325, SCED 331/341	(Total: 17 credits)
	Spring	R BICH 366/397 E two 300-level BISC, GEE(H&SS), FREE	(Total: 15/16 credits)
4th year	Fall	R BICH 398 or BICH 323 & 333, BIOL 211, BIOL 216, BISC 207/215, LANG 308 E GEE(H&SS)	(Total: 17/18 credits)
	Winter	R SCED 314, SCED 315, SCED 322, SCED 332/342	(Total: 12 <sup>@</sup> credits)
	Spring	R SCED 314, SCED 315, SCED 322, SCED 326, SCED 332/342	(Total 18 <sup>@</sup> credits)

\* LANG 108 is a two-semester course. The course credit will be earned on completion of the course at the end of 1st year Spring.

^ Students who are required to take MATH 005 must take MATH 051 in 1st year Winter.

# Only for students who are required to take MATH 005.

@ Work in SCED 314, SCED 315, SCED 322 and SCED 332/342 commence in 4th year Winter. The course credits will be earned on completion of the course at the end of 4th year Spring.

C = core course; R = required course; E = elective course

## **The Undergraduate Minor Program in Biochemistry**

Except for those studying the BSc programs offered by the Biochemistry Department, any undergraduate students at HKUST with a CGA of 4.50 (C) or above may enroll in the Biochemistry Minor Program. The students must declare their intention to enroll in the minor program no earlier than the first semester of their second year but no later than the last day of the add/drop period in the first semester of their final year of study.

The Biochemistry Minor Program requires a minimum total of eighteen credits taken from the following list of courses:

- (a) Core courses: BICH 121\*, BICH 122\*, BICH 201 and BICH 202;
- (b) One 300-level BISC elective course; and
- (c) One BICH/BIOL/BISC elective course.

000- or 100-level BICH/BIOL/BISC courses taken in the students' second or third year cannot be used to count toward the elective requirements of this minor program.

To graduate with a minor in Biochemistry, the students must be enrolled in the minor program and completed all of its requirements, as well as all the requirements of their major program of study; and have attained an average of at least 3.50 (C-) in courses taken within the minor program.

\* *Students who plan to use BISC 103 to fulfill the GEE(SCIE) requirement must take BISC 103 before taking BICH 121 and BICH 122. The prerequisite for BICH 121 will be waived for students without AL/AS Biology/Chemistry who will have taken BISC 001, BISC 002, BISC 103 or BISC 105.*