

Undergraduate Programs

The **Bachelor of Science degree program in Chemistry** provides an excellent general training in analytical thinking and problem solving and prepares students for employment in the areas of chemical science, education and technology or further study in graduate research. The curriculum has been designed to allow students flexibility in determining the extent of their specialization. The graduation requirement is 100 credits of which a minimum of 54 must be in Chemistry itself. In keeping with the philosophy of education at HKUST a broad range of subjects are also covered: Engineering (3 credits), Computer (3 credits), Business and Management (3 credits), Humanities and Social Science (12 credits), Non-chemistry Science (8 credits) and Language (4 credits). This leaves a total of up to 13 more 'Free elective' credits which may be taken in Chemistry itself or any of the above areas to develop a student's special interests. Within Chemistry, 45 credits are devoted to the basic training in analytical, inorganic, organic and physical chemistry and developing modern laboratory techniques and skills. Advanced Chemistry electives are available in a wide range of topics including polymer, advanced materials for electronics and optics, medicinal chemistry, environmental chemistry, computational chemistry and undergraduate research, allowing students to gain hands-on knowledge and access to opportunities in both today's and tomorrow's job markets.

The **Bachelor of Science degree program in Chemistry and Science Education** is intended for students who are interested in becoming teachers of chemistry and sciences in secondary schools after graduation. This is a four-year joint program with the Hong Kong Institute of Education. Roughly six semesters of course works will be done at HKUST and two semesters at the Hong Kong Institute of Education, plus field experience. To complete the program, the students need to earn 139 credits. A total of 41 credits of these are used to satisfy the requirements of a teaching qualification. Program graduates will be granted Registered Teacher Status (RTS) by the Education and Manpower Bureau upon application.

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

Curriculum for BSc in Chemistry

Major Program Requirements

Core courses

CHEM 111	Organic Chemistry I	[3-1-0:4]
CHEM 121	Physical Chemistry I	[3-1-0:4]
CHEM 131	Inorganic Chemistry I	[3-1-0:4]
CHEM 153	Molecular Characterization Laboratory I	[0-2-5:4]
CHEM 155	Synthetic Laboratory I	[0-2-5:4]

Required courses

CHEM 141	Analytical Chemistry	[3-0-0:3]
CHEM 212	Organic Chemistry II	[3-0-0:3]
CHEM 222	Physical Chemistry II	[3-0-0:3]
CHEM 232	Inorganic Chemistry II	[3-0-0:3]
CHEM 244	Analytical Chemistry II	[3-0-0:3]
(1) CHEM 254	Molecular Characterization Laboratory II	[0-2-5:4]
(1) CHEM 256	Synthetic Laboratory II	[0-2-5:4]
CHEM 391	Chemical Information	[1-0-0:1]
CHEM 392	Chemistry Undergraduate Seminar	[0-1-0:1]
(2) COMP 101	Exploring Multimedia and Internet Computing	[2-0-2:3]
(3) MATH 011	Mathematics for Physical Sciences I	[3-1-0:3]
MATH 106	Mathematics for Physical Sciences II	[3-1-0:3]
MATH 150	Introduction to Ordinary Differential Equations	[2-1-0:2]

Elective courses

Elective types		Minimum no. of courses	Minimum total credits
(4) CHEM	Chemistry Elective	3	9
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	
(5) 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:

(6) HLTH 001	Healthy Life Style	[0 credit]
--------------	--------------------	------------

Notes:

- (1) Students may seek departmental approval to replace these two courses with CHEM 398 Undergraduate Research plus a Chemistry elective totaling at least eight credits.
- (2) This course may be replaced by another COMP course upon approval by the Department.
- (3) Students entering with AL Pure Mathematics take a free elective in Fall.
- (4) CHEM 398 and CHEM 399 are two possible electives.
- (5) Of these courses, at least one course in Humanities and one in Social Science are required.
- (6) 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 Chemistry. Students must take additional course(s) and/or elective(s) of higher-than-required credit value to meet this minimum total of 100 credits.

Recommended Pattern of Study for BSc in Chemistry

1st year	Fall	C CHEM 111, CHEM 131 R COMP 101, LANG 108, MATH 011/FREE O HLTH 001	(Total: 14 credits)
	Spring	C CHEM 155 R CHEM 212, CHEM 232, LANG 108, MATH 106 E GEE(H&SS) O HLTH 001	(Total: 17* credits)
2nd year	Fall	C CHEM 121 R CHEM 141, CHEM 256, LANG 208, MATH 150 E GEE(H&SS)	(Total: 17 credits)
	Spring	C CHEM 153 R CHEM 222, CHEM 244, CHEM 391, CHEM 392, LANG 209 E GEE(SB&M), GEE(H&SS)	(Total: 19 credits)
3rd year	Fall	R CHEM 254, LANG 308 E two CHEM, GEE(ENGG), FREE	(Total: 17 credits)
	Spring	E CHEM, GEE(H&SS), three 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.

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

Curriculum for BSc in Chemistry and Science Education

Major Program Requirements

Core courses

CHEM 111	Organic Chemistry I	[3-1-0:4]
CHEM 121	Physical Chemistry I	[3-1-0:4]
CHEM 131	Inorganic Chemistry I	[3-1-0:4]
CHEM 141	Analytical Chemistry	[3-0-0:3]
CHEM 153	Molecular Characterization Laboratory I	[0-2-5:4]
CHEM 155	Synthetic Laboratory I	[0-2-5:4]

Required courses

CHEM 212	Organic Chemistry II	[3-0-0:3]
CHEM 222	Physical Chemistry II	[3-0-0:3]
CHEM 232	Inorganic Chemistry II	[3-0-0:3]
CHEM 244	Analytical Chemistry II	[3-0-0:3]
(1) COMP 101	Exploring Multimedia and Internet Computing	[2-0-2:3]
(2) MATH 011	Mathematics for Physical Sciences I	[3-1-0:3]
MATH 106	Mathematics for Physical Sciences II	[3-1-0:3]
MATH 150	Introduction to Ordinary Differential Equations	[2-1-0:2]
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 341	Foundation Studies in the Teaching and Learning of Chemistry	[3-0-0:3]
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	
(3) CHEM	Chemistry Elective	1	3
(4) SCIE	Science Elective	7	21
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	
(5) 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:

(6) HLTH 001	Healthy Life Style	[0 credit]
--------------	--------------------	------------

Notes:

- (1) This course may be replaced by another COMP course upon approval by the Department.
- (2) Students entering with AL Pure Mathematics take a FREE/SCIE/GEE elective in Fall of the first year and replace that particular elective with a MATH elective later.
- (3) Students have to elect one Chemistry course at 200-level or above or other relevant courses that are approved by the Department.
- (4) Science elective courses have to be chosen from the following two groups of courses, with a minimum of three courses from each group.
Group A: PHYS 002/007, PHYS 111, PHYS 112, PHYS 126
Group B: BIOL 104, BIOL 108, BIOL 202, BIOL 216
Students without AL Biology background must take BISC 001 as free elective before taking other Biology elective courses.
- (5) Of these courses, at least one course in Humanities and one in Social Science are required.

(6) 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 139 credits is required for the BSc program in Chemistry and Science Education.

Recommended Pattern of Study for BSc in Chemistry and Science Education

1st year	Fall	C CHEM 111, CHEM 131 R COMP 101, LANG 108, MATH 011 O HLTH 001	(Total: 14 credits)
	Spring	C CHEM 155 R CHEM 212, CHEM 232, LANG 108, MATH 106 E GEE(H&SS) O HLTH 001	(Total: 17* credits)
2nd year	Fall	C CHEM 121, CHEM 141 R LANG 208, MATH 150 E GEE(H&SS), SCIE(A), FREE	(Total: 19 credits)
	Spring	C CHEM 153 R CHEM 222, CHEM 244, LANG 209, SCED 213, SCED 214	(Total: 17 credits)
3rd year	Fall	R SCED 311, SCED 321, SCED 323, SCED 324, SCED 325, SCED 341	(Total: 17 credits)
	Spring	E CHEM, two SCIE(A), SCIE(B), GEE(ENGG), GEE(H&SS)	(Total: 18 credits)
4th year	Fall	R LANG 308 E SCIE(A)/(B), two SCIE(B), GEE(SB&M), GEE(H&SS), FREE	(Total: 19 credits)
	Winter	R SCED 314, SCED 315, SCED 322, SCED 342	(Total 12# credits)
	Spring	R SCED 314, SCED 315, SCED 322, SCED 326, SCED 342	(Total: 18# 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.

Work in SCED 314, SCED 315, SCED 322 and SCED 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 Chemistry

Except for those studying the BSc programs in Chemistry, any undergraduate student with a CGA of 4.5 (C) or above may enroll in the Chemistry Minor Program^[1]. 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 Chemistry Minor Program requires a minimum of 18 credits of Chemistry courses, of which

(i) one course must be taken from each of the following areas:

Analytical Chemistry: CHEM 141 (Analytical Chemistry)

Inorganic Chemistry: CHEM 131* (Inorganic Chemistry I)

Organic Chemistry: CHEM 111* (Organic Chemistry I) or
CHEM 101* (Fundamentals of Organic Chemistry)

Physical Chemistry: CHEM 121 (Physical Chemistry I) or
CHEM 102 (Physical Chemistry: Fundamentals and
Applications)

(ii) at least one course must be at the 300-level or above.

To graduate with a minor in Chemistry, 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 3.5 (C-) in courses taken within the minor program.

Notes:

[1] Students entering this minor program should have AL/AS Chemistry or equivalent background.

* Students who plan to use CHEM 100 to fulfill the GEE(SCIE) requirement must take CHEM 100 before taking CHEM 101, CHEM 111 and CHEM 131.