

College of Science

理學院

Department of Chemistry

化學系



香港城市大學
City University of Hong Kong

Bachelor of Science in Chemistry

理學士(化學)



Student Handbook
2022-2023

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October 2022

INTRODUCTION

This Handbook contains useful information for students enrolled in Bachelor of Science in Chemistry. Students are advised to familiarize themselves with this Handbook so as to obtain a general overview of the Department and its teaching courses. It is, however, intended to be read in conjunction with other official information posted by the Academic Regulations and Records Office, such as the CityU Academic Regulations and the CityU Academic Calendar which are available on the website of the Academic Regulations and Records Office.

THE DEPARTMENT OF CHEMISTRY

The **Department of Chemistry** offers studies and research in fundamental and applied aspects of chemistry, life, molecular and environmental sciences to about 250 undergraduate and 280 postgraduate students. The Department consists of 29 academic staff including renowned scientists, e.g. Fellows of the European Academy of Sciences, Highly Cited Researchers (listed by Clarivate Analytics), etc., as well as about 70 research staff members. The study programmes are designed to help students understand important scientific issues, current technologies and future challenges in light of local, regional and global needs following the outcomes-based teaching and learning framework. An interdisciplinary approach is adopted and an emphasis is placed on the integration of theory with practical classes via hands-on experience. The teaching and research laboratories provide a stimulating environment to do experimental work utilizing state-of-the-art equipment and instruments. Relevant industrial experience in local and international companies and research institutions is included as appropriate. Overseas field trips and exchange studies complement the core study programmes. Students are also encouraged to attend departmental seminars by well-known visiting scientists. The Department also co-supervises about 12 PhD students with the University of Science and Technology, China in our Advanced Laboratory of Environmental Research and Technology in Suzhou.

The Department offers one full-time undergraduate major in Chemistry. This major also has three study streams, namely Comprehensive Chemistry, Cosmetic Chemistry and Forensic Chemistry to provide students with in-depth knowledge in a selected area in Chemistry based on their own interests and future career goals.

In addition, the BSc programme in Chemistry (Comprehensive Chemistry Stream) has been accredited by the Royal Society of Chemistry (RSC). This will upkeep the quality of the programme to an internationally competitive standard and enhance our graduates' employability.

The Department strongly fosters interdisciplinary research and development activities. Acquisitions of equipment highlighted the multidisciplinary nature of experimental and theoretical research. Three NMRs of 300, 400 and 600 MHz are set up for undergraduate & postgraduate teaching and research applications in study of molecular structures, interactions, kinetics and dynamics, as well as biological, synthetic solutions and composites. NMR applications & analysis cover the fields of life science, materials research, pharmaceuticals, biotechnology, chemistry, metabolites, nutritional science and molecular diagnostics, etc. Single Crystal and Powder X-ray Diffraction (XRD) are major tools setup for chemical crystallography, structural biology, quantitative and qualitative analysis on crystallinity, phase orientation, scattering portfolio, etc. An Atomic Force Microscope (AFM) has been setup as a world-leading instrument for direct imaging in air/liquid/vacuum and broad temperature/ humidity control with ultra-high sensitivity, accuracy, and resolution for a wide variety of properties not limit to surface topography, but also a benchmark for surface potential, electrical conductivities,

electromagnetic properties under both ambient and high-vacuum conditions down to atomic-scale.

The two confocal and compound microscopes are fitted with lasers and filters for detecting the emission ranging from the fluorescent to the near infrared spectrum of novel chemicals introduced inside cells and organisms. A metabolomics facility provides support and training on liquid chromatography based analyses of metabolites associated with biological and toxicological interactions. A laser laboratory offers a wide variety of experimental facilities for the spectroscopic studies of the reaction mechanisms, relaxation processes to excited state dynamics of interest in photochemistry, photophysics and photobiology. This laboratory is featured with a wavelength tunable Ti:Sapphire femtosecond laser coupled to the femtosecond transient absorption spectrometer and a nanosecond flash photolysis system equipped with a high power ns-pulsed Nd:YAG laser. Three pieces of equipment have been installed, namely a genome sequencing system, a peptide synthesizer and a DNA/RNA synthesizer for peptides and DNA/RNA research studies.

Staff expertise currently spans from fields of analytical chemistry, green and synthetic chemistry, spectroscopy and catalysis, materials chemistry, computational chemistry to other biological chemistry area e.g. environmental biology and chemistry, biochemistry, cell biology, biosensing, microbiology and bioactive compounds. Current research of the Department focuses on catalyst/new materials design and synthesis, organic electroluminescent devices, photo-responsive and luminescent chemosensing, proteomics and metabolomics, nano-bio interfaces, and sustainable development in the marine ecosystem. CityU's Chemistry has been widely recognized as reflected from various global rankings, e.g. NTU Ranking 2022 by subject – Chemistry (#1 in Hong Kong); ARWU Global Ranking of Academic Subjects 2022 Chemistry (#2 in Hong Kong); QS World University Rankings by Subject 2022– Chemistry (#39 in Asia Pacific). One of the highlights of our research has been the leading role we have played in the State Key Laboratory in Marine Pollution (SKLMP) and the Center of Super-Diamond and Advanced Films (COSDAF).

The Department endeavours to develop close links with both the public and industrial sectors to keep abreast of society needs. Many of the staff research projects and undergraduate/postgraduate research projects are carried out in collaboration with industry partners and government bodies as well as with other local and overseas universities.

With the recruitment of new academic staff members in strategic areas of chemistry discipline, the Department is ready to take up the challenges and conduct cutting edge research in new strategic areas.

MEMBERS OF STAFF

Academic Staff	Name	Tel. No.	E-mail (...@cityu.edu.hk)
Acting Head and Chair Professor Associate Dean (Research and Postgraduate Education) of CSCI Director of SKLMP	Prof Kenneth M Y LEUNG, JP PhD (<i>Glasgow</i>)	3442-7198	chem.head
Associate Head and Associate Professor	Dr K C LAU PhD (<i>UCDavis</i>)	3442-6849	kaichung
Chair Professor Dean of CSCI	Prof C S LEE PhD (<i>HKU</i>)	3442-7826	apcslee
Professor Associate Director of TED	Prof Kenneth K W LO PhD (<i>HKU</i>)	3442-7231	bhkenlo
Visiting Distinguished Professor and Senior Fellow of IAS	Prof Jean-Marie LEHN Nobel Laureate in Chemistry		
Emeritus Professors	Prof T C LAU PhD (<i>HKU</i>)	3442-7811	bhtclau
	Prof Nora F Y TAM, BBS, JP PhD (<i>York, UK</i>), FIBiol, CBiol, MCIWEM	3442-7793	bhntam
Honorary Professors	Prof Paul K S LAM, SBS, JP PhD (<i>Sheffield</i>)		bhpksl
	Prof Zhongfan LIU PhD (<i>Tokyo</i>)		
Chair Professor	Prof Y CHI PhD (<i>Illinois</i>)	3442-9242	yunchi
Lee Shau Kee Chair Professor of Materials Science and Chair Professor	Prof Alex K Y JEN PhD (<i>Pennsylvania</i>)	3442-8451	alexjen
Herman Hu Chair Professor of Nanomaterials	Prof H ZHANG PhD (<i>Peking</i>)	3442-4102	hua.zhang

Professor	Prof Michael C W CHAN PhD (<i>Durham</i>)	3442-9678	mewchan
Associate Professors	Dr S G CHEUNG PhD (<i>HKU</i>)	3442-7749	bhsgche
	Dr Vincent C C KO PhD (<i>HKU</i>)	3442-6958	vinccko
	Dr Richard Y C KONG PhD (<i>Monash</i>)	3442-7794	bhrkong
	Dr Kit C K KWOK PhD (<i>Penn State</i>)	3442-6858	ckkwok42
	Dr Peggy P K LO PhD (<i>McGill</i>)	3442-7840	peggylo
	Dr J D LUO PhD (<i>WHU</i>)	3442-7720	jingdluo
	Dr Andy C K SIU PhD (<i>CUHK</i>)	3442-2272	chiksiu
	Dr H Y SUN PhD (<i>Singapore</i>)	3442-9537	hongysun
	Dr Alex C Y WONG PhD (<i>HKU</i>)	3442-6831	acywong
Dr G Y ZHU PhD (<i>Pittsburgh</i>)	3442-6857	guangzhu	
Assistant Professors	Dr Maria V BABAK PhD (<i>Vienna</i>)	3442-9710	mbabak
	Dr X CHEN PhD (<i>JLU</i>)	3442-7822	xche22
	Dr Z X FAN PhD (<i>NTU</i>)	3442-7817	zhanxi.fan
	Dr Brian C W KOT PhD (<i>PolyU</i>)	3442-7681	briankot

	Dr Z LU PhD (<i>Germany</i>)	3442-7304	zhenpilu
	Dr T H LY PhD (<i>Sungkyunkwan</i>)	3442-9329	thuchly
	Dr Y MATSUDA PhD (<i>Tokyo</i>)	3442-7839	ymatsuda
	Dr Will Y K PENG PhD (<i>Oxford</i>)	3442-7824	ykpeng
	Dr C TAN PhD (<i>Singapore</i>)	3442 9405	chaoltan
	Dr R Q YE PhD (<i>Rice</i>)	3442-9023	ruquanye
	Dr Z L ZHU PhD (<i>HKUST</i>)	3442-4559	zonglzhu
Visiting Assistant Professor	Dr Phoebe Y F RUAN PhD (<i>CityU</i>)	3442-7833	yruan8

Technical Staff

Scientific Officers	Dr Yanny C Y CHAN Dr M K TSE	3442-4090 3442-2435	chiuychan4 manktse
Chief Technical Officer	Ms Helen K Y NG	3442-4080	bhhelen
Senior Technical Officer	Mr Benz C P CHAN	3442-4065	bhbccp
Technical Officers	Mr H H CHAN Mr K W CHAU Mr Michael W L CHIANG Miss Amy M Y CHONG Miss Eunice O T KWOK Mr John H Y LAI Mr K F LAM Mr Kenneth K K LAU Dr Ken S M YIU	3442-4070 3442-7107 3442-2775 3442-4089 3442-4064 3442-4068 3442-7007 3442-4082 3442-6187	bhhhc kawchau bhchiang bhachong otkwok bhjlhy bhkflam bhkenlau kensmyiu
Technician	Mr Ivan K K LO	3442-7115	ivan.lo

Administrative Staff

Executive Officer Is	Miss Grace C M NG Ms Crystal K Y WAN	3442-8411 3442-7402	songrace crystalky.wan
Clerical Officer I	Miss Dora P K YIM	3442-7404	dora.yim
Assistant Officer	Mr Chris C Y MA	3442-7265	chungyma
Office Assistant	Miss Sharon H W TSO	3442-4081	yuenwtso

AREAS OF EXPERTISE

	Expertise
Acting Head	
Prof Kenneth M Y LEUNG	Marine Pollution and Ecotoxicology, Environmental Risk Assessment, Marine Ecology, Biodiversity Conservation and Eco-engineered Shorelines
Associate Head	
Dr K C LAU	Computational Chemistry, Structures, Energetics, and Reactivities of Molecular Species, Theoretical Aspects of Chemical Bonds, Reaction Mechanisms, Potential Energy Surfaces, Developing Theoretical Composite Methods for Accurate Energetic Predictions
Staff	
Dr Maria V BABAK	Drug Discovery, Medicinal Chemistry, <i>In vitro</i> and <i>in vivo</i> Target Identification, Proteomics, Preclinical Development
Prof Michael C W CHAN	Inorganic, Organometallic and Supramolecular Chemistry, Catalysis (design of novel catalysts for polymerization reactions and ‘weak attractive ligand–polymer interactions’), Shape-persistent Luminescent Molecular Frameworks and Polymeric Assemblies
Dr X CHEN	Multi-scale Simulations of Organic and Organic-inorganic Hybrid Materials via Combinations of Quantum-chemistry Approaches, Condensed-matter Physical Models, and Molecular Dynamics Simulations
Dr S G CHEUNG	Microplastic pollution, Marine pollution and ecotoxicology, Ecology and conservation of horseshoe crab, Intertidal ecology
Prof Y CHI	Organometallic Material Chemistry, Organic and Transition-Metal Based Light Emitting Materials for OLEDs, Carrier Transporting Materials for Photovoltaics
Dr Z X FAN	Materials chemistry, Nanoscience, Metal and metal-based nanomaterials, Crystal phase control, Catalysis, Energy conversion

Prof Alex K Y JEN	Utilizing Molecular, Polymeric, and Biomacromolecular Self-assembly to create ordered arrangement of Organic and Inorganic Functional Materials for Energy, Photonics, Opto-electronics, Nanomedicine, and Nanotechnology. Employing the “Molecular Engineering” approach to tailor size, shape, sequence, and functionality of Organic/Hybrid Functional Materials and explore their applications. Organic and hybrid perovskite solar cells and light-emitting diodes, electro-optic materials, and wearable electronics.
Dr Vincent C C KO	Inorganic and Organometallic Chemistry, Mechanochemistry, Photocatalysis, Photophysics, Photochemistry, Luminescent and Stimuli-Responsive Materials, and Time-resolved Spectroscopy
Dr Richard Y C KONG	Gene Expression and Control Mechanisms, Epigenetics, Molecular Toxicology, DNA-Based Diagnostics
Dr Brian C W KOT	Diagnostic Imaging, Postmortem Imaging, Forensic Science, Medicine and Pathology, Conservation Medicine, Environmental Science
Dr Kit C K KWOK	RNA Biology, Chemical Biology, Nucleic Acids, Gene Regulation, G-quadruplex, Aptamer
Prof C S LEE	Biomedical Materials, Nanoscience and Nanotechnology, Organic Light-Emitting Devices (OLEDs), Organic Optoelectronics, Surface Science of Organic Semiconductors and Nanomaterials
Prof Kenneth K W LO	Analytical, Inorganic and Organometallic Chemistry, Photophysics and Photochemistry, Bioconjugation, Biomolecular and Cellular Probes, Imaging Reagents, and Photodynamic Therapeutics
Dr Peggy P K LO	Chemical Biology, DNA Nanotechnology, Synthetic Chemistry, Biomimetics, Biomolecular Sensing, Bioimaging, Drug delivery
Dr Z LU	Organic Chemistry, Organometallic Chemistry, Main Group Chemistry, Catalysis
Dr J D LUO	Organic Materials Chemistry, Organic Nonlinear Optics, Near-infrared Molecular Photonics, Polymer Chemistry, and Materials and Devices for Ultrafast Information Processing and Hybrid Photonics

Dr T H LY	2D layered materials (Graphene, Transition Metal Dichalcogenides, etc.), Materials Science, Materials Characterization, Devices
Dr Y MATSUDA	Bioorganic Chemistry, Natural Products Chemistry and Biosynthesis, Enzymatic Chemistry
Dr Will Y K PENG	Material Surface Chemistry for the Design of Hetero (Photo) Nanocatalysts and MRI Nanocontrast Agents
Dr Andy C K SIU	Computational Chemistry, Density Functional Theory Molecular Dynamics Studies on the Mechanisms of Chemical Reactions at Finite Temperatures, Dissociation Chemistry of Biomolecular Ions and Nano-sized Particles in the Gas Phase, Homogeneous Catalysis, and Heterogeneous Catalysis on 2D Materials
Dr H Y SUN	Chemical Biology, Fluorescent Probes, Bioimaging, Microarray Screening, Peptides, Biomaterials, Target Identification
Dr C TAN	2D Materials; Electronics; Optoelectronics; Biomaterials; Nanomedicine
Dr Alex C Y WONG	Activation of Alkynes by Transition Metals, Alkyne Cyclization, Metallacycles, Metalated Heterocycles, Organometallic Mechanisms, DFT Calculations, Non-Innocent Ligands, Nano Drug Carriers, Cosmetic Formulations
Dr R Q YE	Material Science, Sustainable Energy Conversions, Electrification, Laser-assisted Materials, Manufacturing, Fluorescent Nanomaterials
Prof H ZHANG	Materials Chemistry, Nanoscience and Nanotechnology, especially phase engineering of nanomaterials (PEN) and controlled epitaxial growth of heterostructures, including the synthesis of ultrathin two-dimensional nanomaterials, novel metallic and semiconducting nanomaterials, novel amorphous nanomaterials, and their hybrid composites for applications in catalysis, clean energy, (opto-)electronic devices, chemical and biosensors, and water remediation.
Dr G Y ZHU	Anticancer Drug Development, Drug Mechanism and Target Validation, Drug Delivery, Chemical Biology, Photoactivatable Drugs

Dr Z L ZHU

Materials Chemistry and Physical Chemistry, Material
Design and Synthesis, their physical properties and device
performance for optoelectronics application

I. BSC MAJOR PROGRAMME MANAGEMENT TEAM

Major Leader	Prof Kenneth Lo (Chairperson)
Deputy Major Leader	Dr Y K Peng
Subject Leader	Prof Kenneth Lo
First Year Tutor	Dr Alex Wong
Second Year Tutor	Dr Hongyan Sun
Third Year Tutor	Dr Peggy Lo
Fourth Year Tutor	Dr Andy Siu
Admission Tutor	Dr K C Lau
Deputy Admission Tutor	Dr Peggy Lo
Project Coordinator	Dr G Y Zhu
Timetabling Officer	Dr K C Lau

II. MODE OF ATTENDANCE AND DURATION

Normally 4 years full-time (FT)
for Advanced Standing I : 3 years
for Advanced Standing II : 2 years

III. AIMS

The aims of the degree programme in the Department of Chemistry are to train and produce graduates who are suitably educated to pursue a developing career in one or more of the following areas: analytical chemistry, environmental chemistry, inorganic chemistry, organic chemistry and physical chemistry and to meet local and regional requirements in the industrial, commercial, government or education sectors.

IV. SPECIFIC MAJOR INTENDED LEARNING OUTCOMES

On completion of the major, Chemistry graduates will be able to:

Describe the general chemical principles appropriate to the study of chemistry.

- Explain the important aspects of chemical terminology, nomenclature, convention and units.
- Describe the structure and properties of atoms, ions, molecules and materials.
- Apply the principles of thermodynamics and kinetics to chemistry.
- Apply the principles and procedures used in chemical analysis and characterization.

Competently perform a wide range of laboratory and technical procedures in chemistry.

- Handle chemicals in a professional manner, through knowledge and adherence to chemical safety legislation.
- Operate laboratory procedures in synthetic and analytical chemistry.
- Evaluate experimental data through testing hypotheses, defining problems and creating innovative and practical solutions.
- Communicate and cooperate with other personnel and participate as an effective team member.

Critically evaluate experiments in chemistry as reported in the literature and synthesize information in a constructive manner.

- Demonstrate the ability in oral and written presentations and recognize the limitations inherent in hypotheses.
- Develop strategies for creating, updating, maintaining and enhancing knowledge in chemistry.

Identify, analyze and reflect upon the responsibilities of chemists by applying chemical knowledge to society, commerce and the environment.

- Apply knowledge of synthetic chemistry for the discovery and design of compounds with new and interesting properties.
- Apply the concepts and principles of chemical analysis to environmental, industrial, biological and food sciences.
- Apply chemical knowledge to address ethical and social issues in the work environment.

V. STRUCTURE AND ASSESSMENT OF PROGRAMME (For Normative 4-year Degree)

Period of Study

The BSc programme is operated under the Credit Unit System. The major comprises **120-144** credit units to be undertaken normally within four academic years. Each academic year comprises two 13-week semesters, Semester A and Semester B with an end of semester examination. Each course offered in a major may require a student to attend between 2 and 8 hours of classes per week, either as lectures, tutorials and/or practicals.

Academic Structure

Please refer to the web-version of the “Academic Regulations” for guidelines and specific academic regulations under the Credit Unit System. In summary, BSc degree programme is composed of courses which can be classified as “**Major Required Courses**” or “**Major Elective Courses**”. A list of **required** and **elective** courses is shown in Appendix I. Each major is made up of four main components as detailed below:

For Chemistry Major

Degree Requirements	Normative 4-year Degree	Normative 4-year Degree (GREAT Stream)	Advanced Standing I	Advanced Standing II (Senior-year Entry)
Gateway Education Requirement	30 CU	30 CU	21 CU	12 CU
<u>University Requirements</u>				
1. <i>GE English</i>	6 CU	6 CU	6 CU	3 CU
2. <i>Chinese Civilisation – History and Philosophy</i>	3 CU	3 CU	3 CU	Not a compulsory requirement
<u>Distributional Requirements</u>	12 CU	12 CU	6 CU	3 CU
<i>Area 1: Arts and Humanities</i>	<i>(At least one course from each of the three areas)</i>	<i>(At least one course from each of the three areas)</i>	<i>(From two different areas)</i>	
<i>Area 2: Study of Societies, Social and Business Organisations</i>				
<i>Area 3: Science and Technology</i>				
College/School-specified Courses [^] *	9 CU [^]	9 CU [^]	6 CU*	6 CU*
College Requirement	6 CU	13-17 CU	0 CU (6 CU waived)	0 CU (6 CU waived)
Major Requirement	66 CU	55-60 CU	57 CU	45 CU
<u>Required Courses</u>	(Core: 38 Elective: 28)	(Core: 41 Elective: 14-19)	(Core: 38 Elective: 19)	(Core: 38 Elective: 7)
<i>Courses that must be passed to complete a major</i>				
<u>Elective Courses</u>				
<i>Courses chosen from a defined set of courses</i>				
Free Electives	18 CU	18-23 CU	12 CU	3 CU
<i>Any courses which are not included in the above three requirements</i>				
Minimum Credit Units for Graduation	120 CU	120 CU	90 CU	60 CU

^/* College/School-specified courses for fulfilling the Gateway Education requirement

Course Code	Course Title	Level	Credit Units	Remarks
Normative 4-year Degree				
MA1200/ MA1300	Calculus and Basic Linear Algebra I/ Enhanced Calculus and Linear Algebra I	B1	3	
MA1201/ MA1301	Calculus and Basic Linear Algebra II/ Enhanced Calculus and Linear Algebra II	B1	3	
CS1102/ CS1302	Introduction to Computer Studies/ Introduction to Computer Programming	B1	3	
Advanced Standing I				
Any courses not within the Major Requirement (including core courses and electives)				
Advanced Standing II (Senior-year Entry)				
Any courses not within the Major Requirement (including core courses and electives)				

For the stream of Global Research Enrichment and Technopreneurship Programme (GREAT):

Course Code	Course Title	Level	Credit Units	Remarks
MA1200/ MA1300	Calculus and Basic Linear Algebra I/ Enhanced Calculus and Linear Algebra I	B1	3	
MA1201/ MA1301	Calculus and Basic Linear Algebra II/ Enhanced Calculus and Linear Algebra II	B1	3	
CS1302	Introduction to Computer Programming	B1	3	

College Requirement

Course Code	Course Title	Level	Credit Units	Remarks (e.g. College Accreditation, or Exemption requirements, etc.)
Normative 4-year Degree (6 credit units)				
<i>Choose two from the following four science subject areas:</i>				
<i>Biology</i>				
CHEM1200	Discovery in Biology	B1	3	
<i>Chemistry</i>				
CHEM1101/ CHEM1300	Introduction to Chemistry/ Principles of General Chemistry	B1	3	
<i>Mathematics</i>				
MA1501/ MA1502	Coordinate Geometry/ Algebra	B1	3	
<i>Physics</i>				
PHY1101/ PHY1201	Introductory Classical Mechanics/ General Physics I	B1	3	
<i>Compulsory attendance for the following two soft skills courses:</i>				
CSCI1001 CSCI1002	Employability for Scientists Career Lab for Scientists	B1	0	
Advanced Standing I (0 credit unit)				
College Requirements waived.				
Advanced Standing II (Senior-year Entry) (0 credit unit)				
College Requirements waived.				

Note: Students planning to take PHY1201 General Physics I without high school Physics background will be required to take PHY1200 Foundation Physics (a non-credit bearing course in fundamental Physics).

For the stream of Global Research Enrichment and Technopreneurship Programme (GREAT):

Course Code	Course Title	Level	Credit Units	
Research Methodology				
CSCI2002	Workshop on Research Methodology	B2	1	
College Requirements I (6-8 credit units)				
<i>Choose two from the following seven courses:</i>				
<i>Biology</i>				
CHEM3081	Chemical Biology of DNA and RNA	B3	3	

<i>Chemistry</i>				
CHEM2006	Principles of Inorganic Chemistry	B2	4	
CHEM2007	Principles of Organic Chemistry	B2	4	
<i>Mathematics</i>				
MA2172	Applied Statistics for Sciences and Engineering	B2	3	
MA2509	Discrete Mathematics	B2	3	
<i>Physics</i>				
PHY1101	Introductory Classical Mechanics	B1	3	
PHY1202	General Physics II	B1	3	
College Requirements II (6-8 credit units)				
<i>Choose two from the following six courses:</i>				
<i>Biology</i>				
CHEM3017	Molecular Biology	B3	4	
<i>Chemistry</i>				
CHEM2004	Principles of Analytical Chemistry	B2	4	
CHEM2008	Principles of Physical Chemistry	B2	4	
<i>Mathematics</i>				
MA1501	Coordinate Geometry	B1	3	
<i>Physics</i>				
PHY3202	Modern Physics	B3	3	
PHY3204	Wave and Optics	B3	3	

Maximum Credit Unit Limit Permitted under the 4-year Degree Structure

The maximum number of credit units permitted for a degree is as follows:

Normative 4-year Degree: 144 credit units

Advanced Standing I: 114 credit units

Advanced Standing II: 84 credit units

Students who have completed the maximum credit units permitted as mentioned above cannot register for further courses in subsequent semesters/terms except for (a) those pursuing a double major or double degree paying the extra credits exceeding the above maximum credit limit on a self-financed basis; or (b) students who have been granted special permission to exceed the maximum credit limit.

The credits earned from taking LC0200A (3 credit units) and/or LC0200B (3 credit units) and CHIN1001 (3 credit units) will not be counted towards the minimum credit units required for graduation and will not be included in the calculation of cumulative grade point average (CGPA). **However, they will be counted towards the maximum credit units permitted.**

If the credit load exceeds the maximum credit limit (including degree/major requirements + LC0200A, LC0200B and CHIN1001) **for pursuing a minor**, approval must be granted from the Associate Provost (Academic Affairs) via Head and Dean on a very exceptional basis.

Gateway Education Requirements

University Requirements (Required Courses) (9 credit units)

1. Gateway Education English Courses

The GE English consists of **two academic English courses**:

1.1 **University English (3 credit units)**: the course focuses on more general aspects of English rhetoric, composition, argumentation and critical reading and writing.

1.2 **Discipline-specific English (3 credit units)**: the course focuses on more discipline-specific aspects of English.

Students scoring above Level 4 in HKDSE English Language or Grade D in HKALE AS-level Use of English will take two academic English courses:

- University English course: GE1401 University English

- Discipline-specific English course: GE2401 English for Science

Students scoring below Level 4 in HKDSE English Language or Grade D in HKALE AS-level Use of English or students who do not possess an equivalent qualification are required to successfully complete the **English for Academic Purposes (EAP) courses** (LC0200A (3 credit units) and LC0200B (3 credit units)) offered by the Chan Feng Men-ling Chan Shuk-lin Language Centre before they can advance to the GE English courses. Students who have achieved a grade B or above in their overall course results for LC0200A will be permitted to exit the programme at this point. They will achieve 3 credit units and also be considered to have satisfied the pre-requisite for entry to the GE English courses.

2. Chinese Civilisation – History and Philosophy (3 credit units)

The course GE1501 Chinese Civilisation – History and Philosophy helps students explore both the past and present issues in Chinese history and philosophy and also their self-identity in the modern world.

Students scoring below Level 4 in HKDSE Chinese Language, or below Grade D in HKALE AS-level Chinese Language and Culture will be required to successfully complete a **Chinese course** (totalling 3 credit units) offered by the School of Continuing and Professional Education (SCOPE) before they can advance to the GE Chinese course.

For the most updated information of the GE Requirements, please visit the website of Programme and Course Catalogue:

https://www.cityu.edu.hk/catalogue/ug/current/catalogue/catalogue_UC.htm?page=B/ge_requirement.htm

Distributional Requirements (12 credit units)

Students are also required to take a minimum of 3 credit units from each of the three areas below:

- | | |
|---------|---|
| Area 1: | Arts and Humanities |
| Area 2: | Study of Societies, Social and Business Organisations |
| Area 3: | Science and Technology |

College/School-specified Courses (9 credit units)

Students of Normative 4-year Degree are required to take College/School-specified courses for 9 credit units.

Students of Advanced Standing I and II are also required to take any courses not within the Major Requirement (including core courses and electives) as College/School-specified courses for 6 credit units.

College Requirement (6 credit units)

Study Load

According to the University regulation, 1 credit unit at CityU is earned by approximately 40-50 hours of student work over a semester, which include lectures, tutorials, laboratory classes as well as private study (i.e. approximately 2 hours of private study for 1 hour of lecture/tutorial).

Change of Home Major

Students may change their home major. To change their home major, students can login AIMS, select “Change of Home Major” under “Study Plan” tab, to submit their change of home major application. Changes of home major become effective only after at least one semester of study in a prior major. Students wishing to change their home major should seek advice from the Major Leader in advance.

For the most updated information, please visit the website of the Academic Regulations and Records Office: <http://www.cityu.edu.hk/arro>.

Student Exchange Programme

The Department offers exchange programmes to students in each academic semester. For details, please contact the Departmental General Office.

Assessment and Progression

Please refer to the web-version of the “Academic Regulations for Undergraduate Degrees” for general guidelines and specific academic regulations. In particular, students should be aware that the assessment of their academic work in the University has two aspects:

1. Students will receive “Grades” for the assessment of courses which will be used to calculate Grade Point Average (GPA):

$$GPA = \frac{\sum_{i=1}^n G_i U_i}{\sum_{i=1}^n U_i}$$

(Where: G is the grade point awarded and U the credit units earned for the *i*th course. The conversion between Grade and Grade Point Awarded is shown on p.20.)

2. The classification of students’ awards will be based on a “Cumulative Grade Point Average (CGPA)”.

Students’ overall performance are measured by two types of GPA, a Semester GPA (SGPA) and a Cumulative GPA (CGPA) which will be calculated at the end of a semester. The difference of SGPA and CGPA is that SGPA will only be calculated based on the courses registered in that particular semester, while CGPA is calculated for all courses taken during enrolment for a specific programme. **CGPA will be used as the award criteria.**

In the calculation of a student’s SGPA and CGPA, grades of P, I, IP, TR, Z, AU, X and WD are not counted, while grades of F are counted. However, the ‘F’ grade will not be counted in student’s CGPA if the ‘F’ grade is recovered by repeating the same course. Students should bear in mind that some courses are only offered in alternate years. Hence, if they failed these courses, they may not be able to repeat them in the following academic year.

Under the Credit Unit System, the ‘D’ grade is equivalent to a grade point of only **1.0**. ‘D’ is a grade that shows a student has sufficient familiarity with the subject matter to enable the student to progress without repeating the course. However, grade ‘D’ will pull down the average grade and this can lead to serious problems. It is therefore advisable for students with a grade of ‘D’ to repeat the course to improve their GPA. However, students should consider and decide carefully as “fail” grade in the second attempt will stand according to the “Academic Regulations for Undergraduate Degrees” of the University.

When a student’s SGPA or CGPA falls below 2.00, the student will be given a warning letter issued by the Head of Department. Students may be advised to reduce their study load in the following semester, or be given an academic warning.

Regarding termination of study, please note the Academic Regulations:

- “1. The University has the right to terminate a student’s study for failure to maintain satisfactory academic progress, as determined by the Examination Board, or to comply with the policies and procedures of the University.**
- 2. The Examination Board may terminate the study of a student under the following circumstances:**
 - (i) The student’s SGPA is below 1.70 for any three enrolled semesters; or**
 - (ii) The student’s academic progress is unsatisfactory and is unable to meet the conditions stipulated by the home academic unit after being put on Academic Probation for one semester.**
- 3. Irrespective of 2 above, the Examination Board may prescribe any other criteria for terminating a student’s study.**
- 4. Notwithstanding 2 and 3 above, students’ studies will be terminated if they fail to pass a required course, or its equivalent/substitute course, after three attempts.**
- 5. For termination of studies due to academic reasons, students may apply for readmission to the University, with admission to any degree study occurring no earlier than one academic year after the termination. Upon readmission after termination of study, students may be given one additional opportunity to pass each required course they have failed in their three previous attempts.”**

Students who have earned 12 credit units or more, achieved a SGPA of 3.70 or above, and not failed any courses at the end of each semester can be recommended for the Dean’s List.

Students may be granted an undergraduate award, only if they have achieved a CGPA of 1.70, or above. The classification and recommendation of conferment of final awards is decided by the Departmental Assessment Panel.

The Assessment Panel is a University body responsible for assigning grades to students for their courses. If students wish an Assessment Panel to take into account illness or some other circumstances that has adversely affected their performance in an examination, or ability to attend an examination, or to complete coursework, they must refer the circumstances of the case to the home academic unit using the “Mitigation Request Related to Assessment” System via AIMS and submit the original of the uploaded supporting document(s) to the home academic unit as soon as possible and no later than 5 working days of the scheduled date for completing the affected examination or assessment.

Award Classification for Undergraduate Degree Programmes

Degrees with Distinction are awarded based on the CGPA ranking for students in the respective departments/schools graduating in the same semester/term. Students who have fulfilled the stipulated graduation requirements and rank in the top 2% will receive a degree with *summa cum laude* (Highest Distinction). Those who rank in the top 7% but not in the top 2% will receive a degree with *magna cum laude* (High Distinction). Those who rank in the top 15% but not in the top 7% will receive a degree with *cum laude* (Distinction).

Repeating Courses to Improve Grades

Unless otherwise specified, students may repeat a course, or an equivalent course, to recover a failure or to improve a course grade of D, subject to the concerned academic unit's course offering schedule and availability. Only two repeat attempts may be permitted. Course grades for all attempts will appear on the student's academic transcript, but only the final grade earned will be included in the calculation of the student's CGPA.

Grading of Courses

Courses are graded according to the following schedule:

Grade	Grade Point	Grade Definitions	
A+	4.3	Excellent	The qualifiers, such as “Excellent”, “Good”, “Fair” etc., define student performance with respect to the achievement of course intended learning outcomes (CILOs).
A	4.0		
A-	3.7		
B+	3.3	Good	
B	3.0		
B-	2.7		
C+	2.3	Fair	
C	2.0		
C-	1.7		
D	1.0	Marginal	
F	0.0	Failure	
P (Pass-fail course only)		Pass	
[Note: A grade with an asterisk (e.g. B+*) is excluded from the calculation of GPA. The credits earned will not be counted toward the minimum credit requirement for graduation but will be counted toward the maximum number of credit units permitted.]			
Operational Grades			
IP	In progress	An IP grade is shown where students will register for the same course in the subsequent semester/term to complete the assessment of the course.	
I	Incomplete	A grade of incomplete may be granted (i) where there are extenuating circumstances that have prevented a student from completing required work, or attending the examination; (ii) at the discretion of the Assessment Panel. Where an “I” grade is assigned, the Assessment Panel may approve a schedule for the completion of work, or a supplementary examination. An alternative grade should be assigned no later than four weeks after the “I” grade is first reported or as soon as practicable thereafter.	

TR	Credit Transfer	Assigned when a student is granted transfer credits for the course.
Z	Exemption	Assigned when a student is exempted from the course.
AU	Audit	An audited grade is assigned when an auditing student has completed the conditions established at registration as an auditor. No assessment is made or grade awarded for auditing.
X	Late Drop	Assigned when a student is permitted to drop the course after the add/drop deadline.
WD	Withdrawn	Assigned when a student has registered for the course in a semester/term and subsequently submitted a notification of withdrawal from the University.

VI. RULES ON ACADEMIC HONESTY

Students must pursue their studies with academic honesty. Academic honesty is central to the conduct of academic work. Students are expected to present their own work, give proper acknowledgement of other's work, and honestly report findings obtained. As part of the University's efforts to educate students about academic honesty, all students are required to complete the Online Tutorial and Quiz on Academic Honesty, and make a Declaration on their understanding of academic honesty.

Plagiarism is a serious offence involving “the use of somebody else's ideas, words, etc. as one's own”. Examples of such acts are copying other students' work in examinations, in tests, or in tasks for coursework assignments, repetition of part or whole sentences / paragraphs / any materials from hard-copy publications or online sites for one's own use **without acknowledgement of the source in one's work.**

Students who commit an act of academic dishonesty which jeopardizes the integrity of the learning and assessment process may be charged with a **major offence** and be liable to disciplinary action.

Students are advised to refer to the section on “Rules on Academic Honesty” on the website of the Office of the Provost for details.

VII. MINIMUM PASSING REQUIREMENT

Starting from Semester A, 2015/16, undergraduate students must satisfy the following minimum passing requirement for courses offered by CHEM:

“A minimum of 40% in both coursework and examination components.”

VIII. IMPORTANT NOTES FOR COURSE REGISTRATION

1. The maximum capacity for laboratory practical session is **48** in view of limited seating available in teaching laboratories.
2. In case of the course(s) oversubscribed, higher priority will be given to final year students to take the course(s).
3. An elective course will be cancelled if **24** students or less register the course.
4. DegreeWorks
 - It is a web-based degree audit and academic advising tool.
 - It matches a student's academic record against the curriculum requirements and helps students learn easily what courses they still need to take to fulfill the requirements of College/School, Gateway Education (GE), major, minor, etc.
 - It provides features that help students plan their studies and communicate with their advisors, for example, “What If”, “Look Ahead”, “Plans” and “Term Calculators” and “Advice Calculators” functions.
 - Students are reminded to make good use of DegreeWorks and review their “Study Plan” in AIMS annually.
 - For details, please visit ARRO's website:
<http://www6.cityu.edu.hk/arro/content.asp?cid=482>.

IX. COURSES AND RESPECTIVE COURSE LEADERS

(Courses offered to students of the Chemistry major)

CHEM1101	Introduction to Chemistry	Dr Andy Siu
CHEM1200	Discovery in Biology	Dr Y Matsuda
CHEM1300	Principles of General Chemistry	Dr Andy Siu
CHEM2003	Biochemistry <i>(BMS2004 Biochemistry is an equivalent course offered to students from 2017/18.)</i>	Dr Kiwon Ban (BMS)
CHEM2004	Principles of Analytical Chemistry	Dr Peggy Lo
CHEM2005	Principles of Environmental Chemistry	Dr G Y Zhu
CHEM2006	Principles of Inorganic Chemistry	Prof Kenneth Lo
CHEM2007	Principles of Organic Chemistry	Dr J D Luo
CHEM2008	Principles of Physical Chemistry	Dr K C Lau
CHEM2073	Entrepreneurship Programme In Chemistry 1	Dr Y K Peng
CHEM2809	Science Versus Crime	Dr Maria Babak
CHEM3012	Genetics <i>(BMS3203 Genetics is an equivalent course offered to students from 2022/23.)</i>	Dr Terrence Lau (BMS)
CHEM3014	Inorganic Chemistry	Dr Alex Wong
CHEM3015	Organic Chemistry	Dr Andy Siu
CHEM3016	Physical Chemistry	Dr K C Lau
CHEM3027	Analytical Chemistry	Prof Kenneth Lo
CHEM3038	Environmental Sampling and Risk Assessment	To be announced
CHEM3042	Directed Studies in Biology/Chemistry/ Environmental Sciences	Prof Kenneth Lo
CHEM3052	Chemistry Beyond the Molecule: Supramolecular Chemistry	Prof Michael Chan
CHEM3053	Computational Chemistry	Dr K C Lau
CHEM3055	Green Chemistry	To be announced
CHEM3081	Chemical Biology of DNA and RNA	Dr C K Kwok

*BMS: Department of Biomedical Sciences

CHEM3082	Graphene: Fundamentals and Emergent Applications	Dr T H Ly
CHEM3083	Cosmetic Chemistry	Dr Alex Wong
CHEM3084	Forensic Imaging	Dr Brian C W Kot
CHEM4021	Environmental Pollution	Prof Kenneth Leung
CHEM4022	Environmental Toxicology	To be announced
CHEM4029	Advanced Analytical Chemistry	To be announced
CHEM4030	Advanced Inorganic Chemistry	Prof Kenneth Lo
CHEM4031	Advanced Organic Chemistry	Dr J D Luo
CHEM4033	Industrial Chemistry	To be announced
CHEM4034	Environmental Control and Waste Treatment	To be announced
CHEM4035	Environmental Measurements	To be announced
CHEM4036	Project	Dr G Y Zhu
CHEM4037	Seminar Series	Dr G Y Zhu
CHEM4041	Selected Topics in Chemistry	Dr H Y Sun
CHEM4043	Food Chemistry	Dr Vincent Ko
CHEM4045	Medicinal Chemistry	Dr G Y Zhu
CHEM4051	Forensic Chemistry	Dr Vincent Ko
CHEM4054	Chemical Bonding and Molecular Spectroscopy	Dr K C Lau
CHEM4084	Crystallography/Solid-state Inorganic Chemistry	Dr Z L Zhu
CHEM4085	Testing and Certification Sciences	To be announced
CHEM4088	Entrepreneurship Programme In Chemistry 2	To be announced
CHEM4089	Techniques and Instrumentation for Chemical Biology	To be announced
CS1102	Introduction to Computer Studies	Dr Howard W H Leung
CS1302	Introduction to Computer Programming	Dr Chung Chan
CS2204	Fundamentals of Internet Applications Development	Dr Zhenjiang Li
CS2360	Java Programming	Dr Zhimeng Yin
CSCI1001	Employability for Scientists	Dr Jon Lo

CSCI1002	Career Lab for Scientists	Dr Jon Lo
CSCI2002	Workshop on Research Methodology	Dr Jon Lo
CSCI3001	Grand Challenges in the World	Dr Jon Lo
CSCI4002	Industrial Attachment Scheme for Science Students	Prof Daniel Ho
CSCI4005	Overseas Internship Scheme for Science Students	Prof Yang Ren
CSCI4007	Patent Application and Technopreneurship	Prof Daniel Ho
GE1401	University English	Dr Matthew Sung
GE1501	Chinese Civilisation – History and Philosophy	Dr Lisa L S Chui
GE2401	English for Science	Dr Jack Pun
MA1200	Calculus and Basic Linear Algebra I	To be announced
MA1201	Calculus and Basic Linear Algebra II	To be announced
MA1300	Enhanced Calculus and Linear Algebra I	To be announced
MA1301	Enhanced Calculus and Linear Algebra II	To be announced
MA1501	Coordinate Geometry	To be announced
MA1502	Algebra	To be announced
MA2008	Mathematical and Statistical Laboratory (<i>not offered in 2022/23</i>)	To be announced
MA2172	Applied Statistics for Sciences and Engineering	To be announced
MA2509	Discrete Mathematics	To be announced
MGT2324	Introduction to Entrepreneurship	To be announced
MGT4305	Developing and Presenting a Business Plan	To be announced
PHY1101	Introductory Classical Mechanics	Dr Xin Wang
PHY1201	General Physics I	Prof K S Chan
PHY1202	General Physics II	Prof S T Chu
PHY3202	Modern Physics	Dr Bastien Michon
PHY3204	Wave and Optics	Dr Yu Chai

**Details of individual courses are available on CHEM departmental homepage.

X. SERVICING COURSES AND RESPECTIVE COURSE LEADERS

**Students can choose these servicing courses as "Free Electives".*

CHEM2013	Microbiology	Dr Terrence Lau (BMS)
CHEM2071/ CHEM2071A	Biological Chemistry	Dr H Y Sun
CHEM3017	Molecular Biology	Dr Richard Kong
CHEM3068/ CHEM3068A	General Ecology	Dr S G Cheung
CHEM4039	Environmental Conservation and Resources Management	To be announced
CHEM4078/ CHEM4078A	Aquatic Ecology	Dr S G Cheung
GE1346	The Chemists Kitchen (The Science of Food and Cooking)	Dr Andy Siu
GE1353	Science, Buddhism, and Life	Dr Alex Wong
GE1357	Introduction to Chemistry	Dr Vincent Ko
GE2322	The Nobel Prize: A Discovery Approach to Human Greatness	Dr Maria Babak
GE2333	The Science of Cosmetics	Dr Alex Wong
GE2334	Science Versus Crime	Dr Maria Babak

****Details of individual courses are available on CHEM departmental homepage.**

XI. MAJOR PROGRAMME MANAGEMENT AND STAFF-STUDENT COMMUNICATION

Major Programme Committee and Major Leader

The Major Programme Committee is the departmental body responsible for the overall management, operation and quality assurance of the majors. The Committee consists of academic staff and student members. Two students from each major-year, elected by and from the students studying in each year of the major, are appointed to the Committee on a one-year term. **For 2022/23, the Chairperson of the BSc Major Programme Committee is Prof Kenneth Lo who is also the Major Leader.** The Major Leader reports to the Head of Department and is responsible for the effective operation of the major.

Subject Leader

The Subject Leader is responsible for the development of the curriculum and give academic advice to students in relation to the selection of courses. **For 2022/23, the Subject Leader is Prof Kenneth Lo.**

Joint Staff-Student Consultative Committee (JSSCC)

Student feedback is an important element for the quality assurance process of the major. The JSSCC is established to provide a channel of consultative process between students and staff in the Department. The meetings are conducted in an informal manner and are held once every semester. Students are encouraged to express their views and suggestions on the content, organization and teaching of the majors. The JSSCC is made up of student representatives (two from each major-year) and the Year Tutors. **The Chairperson of the JSSCC for 2022/23 is Dr Alex Wong.**

Academic Staff

If you encounter any difficulties in a particular course, you should consult the academic staff concerned without delay. They can be reached by phone or by email. For any problems relating to laboratory classes, laboratory demonstrators are also available for your assistance.

Year Tutors

In order to cultivate a better relationship between students and academic staff, the Year Tutors, who report to Major Leader, are appointed for organising non-academic activities for the students. Their general duties include making scholarship nominations, liaise with Student Development Services (SDS), and organising industrial placements for students etc. For the current academic year of 2022/23, the Year Tutors and their specific responsibilities are listed below:

First Year Tutor	Second Year Tutor	Third Year Tutor	Fourth Year Tutor
<i>Dr Alex Wong</i>	<i>Dr Hongyan Sun</i>	<i>Dr Peggy Lo</i>	<i>Dr Andy Siu</i>
<ul style="list-style-type: none">• Student Mentoring Scheme Coordinator		<ul style="list-style-type: none">• Orientation Day Coordinator• Student Mentoring Scheme Coordinator (Deputy)	<ul style="list-style-type: none">• Student Exchange Coordinator

Student Mentoring Scheme

City University of Hong Kong is operating a mentoring system for new students to help them to adapt to the learning environment of the University. The Department has joined this system since 1996. We aim to foster a better relationship between the academic staff and students, and to facilitate students' whole personal development so that they can make the best of their university education. Together with one senior student, each academic staff member will mentor a group of Year One students. Students may approach their staff or student mentor at any time, especially on matters relating to their academic programme and learning. Staff and student mentors will organise activities throughout your first year to enhance group dynamics. **The coordinators for the Student Mentoring Scheme 2022/23 are Dr Alex Wong and Dr Peggy Lo (Deputy).**

Biology and Chemistry Society (BCHS)

BCH Society is an organization made up of students of the Department of Chemistry. The missions of the Society are to foster a spirit of unity, to provide welfare to its members, and to promote a sense of belonging to the Department among fellow students. The Society through organizing regular social functions provides a focal point for students' social life in the University, and cultivate a closer relationship between students and staff in the Department. Every year it organizes a series of orientation programmes such as the Orientation Camp at the beginning of Semester A for newcomers to familiarize themselves with the various aspects of the Society and student life. It also organizes many other activities for its members such as the Welfare Sale. Students are encouraged to participate in the activities organized by the Society. You can contact the Society via its e-mail address at "su.bchs@student.cityu.edu.hk". **The Liaison Officer of BCHS for 2022/23 academic year is Dr Vincent Ko.**

Canvas

Canvas is an e-learning platform established for all undergraduate and postgraduate courses which can also be used as a means of communication for staff and students. Through Canvas, students can provide feedback to the Major Leaders or Year Tutors throughout the whole year and thus maintain a continuous dialogue with them.

Wiki Site for CHEM students

A special channel has been created to facilitate our communication with students. The link can be found under “Related Links” on the homepage of the CHEM website. The Wiki Site is the main platform to provide important news and announcements for CHEM students’ attention. Please check the Wiki Site on a regular basis.

Student Development Services (SDS)

The SDS of the CityU has many student-centred services that every CityU student can participate in. It provides support and assistance to students in the following ways:

- Attain an all-round development
- Enrich campus life
- Make career plans and choices
- Solve personal problems
- Enhance physical and mental well-being
- Seek financial assistance
- Apply for scholarship
- Solicit welfare provisions

For details, please visit its website at “<http://www.cityu.edu.hk/sds>”.

Do make use of this opportunity to enrich your university life!

Appendix I : Major

&

Appendix II : Recommended Study Plan

BSc in Chemistry

For Students admitted to the major in 2022/23 (Normative 4-year Degree)

1. Gateway Education Requirements (30 credit units)

University Requirements (Required Courses) (9 credit units): Students must satisfy the following requirements before graduation.

- GE English (6 credit units)**

Course Code	Course Title	Level	Credit Units	Sem	Remarks (e.g. College Accreditation, or Exemption requirements, etc.)
GE1401	University English	B1	3	A/B	
GE2401	English for Science	B2	3	A/B	

Students who are required to take English for Academic Purposes 1 & 2 (LC0200A and LC0200B) must successfully complete 6 credit units before studying GE1401 and GE2401. Students have achieved a B grade or above in their overall course result for LC0200A will be permitted to exit the programme at this point and proceed to the GE English courses.

- Chinese Civilisation – History and Philosophy (3 credit units)**

Course Code	Course Title	Level	Credit Units	Sem	Remarks (e.g. College Accreditation, or Exemption requirements, etc.)
GE1501	Chinese Civilisation – History and Philosophy	B1	3	B	

Students scoring below Level 4 in HKDSE Chinese Language, or below Grade D in HKALE AS-level Chinese Language and Culture are also required to take a 3-credit unit Chinese course (CHIN1001).

- Distributional Requirements (12 credit units)**

Students are required to take a minimum of 3 credit units from each of the three areas below:

Area 1 : Arts and Humanities

Area 2 : Study of Societies, Social and Business Organisations

Area 3 : Science and Technology

- College/School-specified courses for fulfilling the Gateway Education requirement (9 credit units)**

Course Code	Course Title	Level	Credit Units	Remarks
MA1200 / MA1300	Calculus and Basic Linear Algebra I/ Enhanced Calculus and Linear Algebra I	B1	3	
MA1201 / MA1301	Calculus and Basic Linear Algebra II/ Enhanced Calculus and Linear Algebra II	B1	3	
CS1102 / CS1302	Introduction to Computer Studies/ Introduction to Computer Programming	B1	3	

For the stream of Global Research Enrichment and Technopreneurship Programme (GREAT):

Course Code	Course Title	Level	Credit Units	Remarks
MA1200 / MA1300	Calculus and Basic Linear Algebra I/ Enhanced Calculus and Linear Algebra I	B1	3	
MA1201 / MA1301	Calculus and Basic Linear Algebra II/ Enhanced Calculus and Linear Algebra II	B1	3	
CS1302	Introduction to Computer Programming	B1	3	

2. College Requirement (6 credit units)

Course Code	Course Title	Level	Credit Units	Sem	Remarks (e.g. College Accreditation, or Exemption requirements, etc.)
<i>Choose two from the following four science subject areas:</i>					
<i>Biology</i>					
CHEM1200	Discovery in Biology	B1	3	A/B	
<i>Chemistry</i>					
CHEM1101/ CHEM1300	Introduction to Chemistry/ Principles of General Chemistry	B1	3	B A/B	
<i>Mathematics</i>					
MA1501/ MA1502	Coordinate Geometry/ Algebra	B1	3	B A	
<i>Physics</i>					
PHY1101/ PHY1201	Introductory Classical Mechanics/ General Physics I	B1	3	A A/B	
<i>Compulsory attendance for the following two soft skills courses:</i>					
CSCI1001 CSCI1002	Employability for Scientists Career Lab for Scientists	B1	0	A B	

Note: Students planning to take PHY1201 General Physics I without high school Physics background will be required to take PHY1200 Foundation Physics (a non-credit bearing course in fundamental Physics).

For the stream of Global Research Enrichment and Technopreneurship Programme (GREAT) (13 – 17 credit units):

Course Code	Course Title	Level	Credit Units	Sem	Remarks (e.g. College Accreditation, or Exemption requirements, etc.)
Research Methodology					
CSCI2002	Workshop on Research Methodology	B2	1	B	
College Requirements I (6-8 credit units)					
<i>Choose two from the following seven courses:</i>					
<i>Biology</i>					
CHEM3081	Chemical Biology of DNA and RNA	B3	3	A	
<i>Chemistry</i>					

CHEM2006	Principles of Inorganic Chemistry	B2	4	A	
CHEM2007	Principles of Organic Chemistry	B2	4	A	
<i>Mathematics</i>					
MA2172	Applied Statistics for Sciences and Engineering	B2	3	A	
MA2509	Discrete Mathematics	B2	3	A	
<i>Physics</i>					
PHY1101	Introductory Classical Mechanics	B1	3	A	
PHY1202	General Physics II	B1	3	A	
College Requirements II (6-8 credit units)					
<i>Choose two from the following seven courses:</i>					
<i>Biology</i>					
CHEM3017	Molecular Biology	B3	4	B	
<i>Chemistry</i>					
CHEM2004	Principles of Analytical Chemistry	B2	4	B	
CHEM2008	Principles of Physical Chemistry	B2	4	B	
<i>Mathematics</i>					
MA1501	Coordinate Geometry	B1	3	B	
<i>Physics</i>					
PHY3202	Modern Physics	B3	3	B	
PHY3204	Wave and Optics	B3	3	B	

3. Major Requirement (66 credit units)

Core Courses (38 credit units)

- Students must take ALL the required courses in the following list.

Course Code	Course Title	Level	Credit Units	Sem	Remarks (e.g. College Accreditation, or Exemption requirements, etc.)
MA2172	Applied Statistics for Sciences and Engineering	B2	3	A	
CHEM2004	Principles of Analytical Chemistry	B2	4	B	
CHEM2006	Principles of Inorganic Chemistry	B2	4	A	
CHEM2007	Principles of Organic Chemistry	B2	4	A	
CHEM2008	Principles of Physical Chemistry	B2	4	B	
CHEM2073	Entrepreneurship Programme In Chemistry 1	B2	3	B	
CHEM3014	Inorganic Chemistry	B3	4	B	

CHEM3015	Organic Chemistry	B3	4	A	
CHEM3016	Physical Chemistry	B3	4	B	
CHEM3027	Analytical Chemistry	B3	4	A	

Major Elective Courses (28 credit units)

Choose electives from **both** Group A and Group B.

Group A (at least 3 credit units or above)

Course Code	Course Title	Level	Credit Units	Sem	Remarks (e.g. College Accreditation, or Exemption requirements, etc.)
CHEM3042	Directed Studies in Biology/Chemistry/Environmental Sciences	B3/B4	1-4	A/B/ Summer	Exclusive from Group B, i.e. students can choose this course in either Group A <u>or</u> Group B.
CHEM4036	Project	B4	6	Summer&A/ A&B	Students of the GREAT stream cannot take this course.
CSCI4002 <u>or</u> CSCI4005	Industrial Attachment Scheme for Science Students Overseas Internship Scheme for Science Students	B3	3	Summer	

Note:

Students who have completed exchange studies with credit transfer (at least 3 credit units) are considered as having fulfilled Group A requirement.

Group B

Course Code	Course Title	Level	Credit Units	Sem	Remarks (e.g. College Accreditation, or Exemption requirements, etc.)
CS2204	Fundamentals of Internet Applications Development	B2	3	A	
CS2360	Java Programming	B2	3	A	
CSCI3001	Grand Challenges in the World	B3	3	B	
CHEM2003	Biochemistry	B2	3	B	BMS2004 Biochemistry is an equivalent course offered to students from 2017/18.
CHEM2005	Principles of Environmental Chemistry	B2	4	B	
CHEM3012	Genetics	B3	4	A	BMS3203 Genetics is an equivalent course offered to students from 2022/23.
CHEM3038	Environmental Sampling and Risk Assessment	B3	4	B Not offered in 2022/23	

CHEM3042	Directed Studies in Biology/Chemistry/Environmental Sciences	B3/B4	1-4	A/B/ Summer	Exclusive from Group A, i.e. students can choose this course in either Group A <u>or</u> Group B.			
CHEM3081	Chemical Biology of DNA and RNA	B3	3	A				
CHEM3082	Graphene: Fundamentals and Emergent Applications	B3	3	A				
CHEM3084	Forensic Imaging	B3	3	B				
CHEM4021	Environmental Pollution	B4	4	B				
CHEM4022	Environmental Toxicology	B4	4	A Not offered in 2022/23				
CHEM4037	Seminar Series	B4	3	Summer&A/ A&B				
CHEM4041	Selected Topics in Chemistry	B4	4	Summer				
CHEM4088	Entrepreneurship Programme In Chemistry 2	B4	6	Summer&A/ A&B				
				#Please note Sem/Year offer				
				2022/23	2023/24	2024/25	2025/26	
CHEM3052 [#]	Chemistry Beyond the Molecule: Supramolecular Chemistry	B3	3	Not offered	B	Not offered	B	
CHEM3053 [#]	Computational Chemistry	B3	3	Not offered	B	Not offered	B	
CHEM3055 [#]	Green Chemistry	B3	3	Not offered	Not offered	B	Not offered	
CHEM3083 [#]	Cosmetic Chemistry	B3	3	Not offered	B	Not offered	B	
CHEM4029 [#]	Advanced Analytical Chemistry	B4	4	To be confirmed	Not offered	To be confirmed	Not offered	
CHEM4030 [#]	Advanced Inorganic Chemistry	B4	4	B	Not offered	B	Not offered	
CHEM4031 [#]	Advanced Organic Chemistry	B4	4	B	Not offered	B	Not offered	
CHEM4033 [#]	Industrial Chemistry	B4	4	Not offered	To be confirmed	Not offered	To be confirmed	
CHEM4034 [#]	Environmental Control and Waste Treatment	B4	4	Not offered	To be confirmed	Not offered	To be confirmed	
CHEM4035 [#]	Environmental Measurements	B4	4	To be confirmed	Not offered	To be confirmed	Not offered	
CHEM4043 [#]	Food Chemistry	B4	3	Not offered	A	Not offered	A	
CHEM4045 [#]	Medicinal Chemistry	B4	3	Not offered	B	Not offered	B	
CHEM4051 [#]	Forensic Chemistry	B4	3	A	Not offered	A	Not offered	
CHEM4054 [#]	Chemical Bonding and Molecular Spectroscopy	B4	3	Not offered	B	Not offered	B	
CHEM4084 [#]	Crystallography/Solid-state Inorganic Chemistry	B4	4	Not offered	A	Not offered	A	
CHEM4085 [#]	Testing and Certification Sciences	B4	4	Not offered	B	Not offered	B	
CHEM4089 [#]	Techniques and Instrumentation for Chemical Biology	B4	4	B	Not offered	B	Not offered	

MA2008 [#]	Mathematical and Statistical Laboratory (Note: Not offered to Year 2 students of normative 4-year degree and Year 1 students of Advanced Standing I.)	B2	3	To be confirmed	Not offered	To be confirmed	Not offered
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For the Comprehensive Chemistry stream:

Core Courses (23 - 24 credit units)

Course Code	Course Title	Level	Credit Units	Sem	Remarks
CHEM1300	Principles of General Chemistry	B1	3	A/B	
CHEM4030	Advanced Inorganic Chemistry	B4	4	B	
CHEM4031	Advanced Organic Chemistry	B4	4	B	
CHEM4054	Chemical Bonding and Molecular Spectroscopy	B4	3	B	
CHEM4036	Project	B4	6	Summer&A/ A&B	To be taken in Year 4*

Choose at least one of the following two courses:

CHEM3042	Directed Studies in Biology/Chemistry/Environmental Sciences	B3/B4	3 or 4	A/B/ Summer	To be taken in Year 4*
CHEM4037	Seminar Series	B4	3	Summer&A/ A&B	To be taken in Year 4*

* These courses with independent investigative methodology are required to account for 25% of the final year work load.

For the Cosmetic Chemistry stream:

Electives (13 – 16 credit units)

Course Code	Course Title	Level	Credit Units	Sem	Remarks
CHEM3083	Cosmetic Chemistry	B3	3	B	
CSCI4002	Industrial Attachment Scheme for Science Students	B4	3	Summer	Project titles to be agreed by the Hong Kong Society of Cosmetic Chemists (HKSCC)

Choose at least one out of the following three courses:

CHEM4030	Advanced Inorganic Chemistry	B4	4	B	
CHEM4031	Advanced Organic Chemistry	B4	4	B	
CHEM4045	Medicinal Chemistry	B4	3	B	

Choose one out of the following two courses:

CHEM3042	Directed Studies in Biology/Chemistry/Environmental Sciences	B3/B4	4	A/B/ Summer	Project in CHEM3042 and CHEM4036 shall be related to Cosmetic Chemistry.
CHEM4036	Project	B4	6	Summer&A/ A&B	

For the Forensic Chemistry stream:**Electives (16 – 17 credit units)**

Course Code	Course Title	Level	Credit Units	Sem	Remarks
CHEM2003	Biochemistry	B2	3	B	BMS2004 Biochemistry is an equivalent course offered to students from 2017/18.
CHEM2809	Science Versus Crime	B2	3	B	
CHEM3084	Forensic Imaging	B3	3	B	
CHEM4051	Forensic Chemistry	B4	3	A	
<i>Choose at least one out of the following two courses:</i>					
CHEM3017	Molecular Biology	B3	4	B	
CHEM3081	Chemical Biology of DNA and RNA	B3	3	A	
<i>Choose one out of the following two courses:</i>					
CHEM3042	Directed Studies in Biology/ Chemistry/Environmental Sciences	B3/B4	4	A/B/ Summer	Project in CHEM3042 shall be related to Forensic Science.
CHEM4089	Techniques and Instrumentation for Chemical Biology	B4	4	B	

For the GREAT Stream:

Core Courses (41 credit units)

- Students must take ALL the required courses in the following list.

Course Code	Course Title	Level	Credit Units	Sem	Remarks (e.g. College Accreditation, or Exemption requirements, etc.)
CHEM3014	Inorganic Chemistry	B3	4	A	
CHEM3015	Organic Chemistry	B3	4	B	
CHEM3016	Physical Chemistry	B3	4	B	
CHEM3027	Analytical Chemistry	B3	4	A	
CHEM4086	Independent Research I	B4	8	A/B	
CHEM4087	Independent Research II	B4	8	B	
CSCI4007	Patent Application and Technopreneurship	B4	3	Not yet offered	
MGT2324	Introduction to Entrepreneurship	B2	3	A	
MGT4305	Developing and Presenting a Business Plan	B4	3	B	

Major Elective Courses (14 - 19 credit units)

Students can select any electives from the current major electives listed under Group A and B as above except CHEM4036 Project.

4. Minor (Optional)

A minor consists of a structured group of courses that focus on a particular academic discipline, allowing students to develop some depth of understanding in a subject area or topic of professional interest. A minor requires 15-18 credit units. The credit units earned to fulfill the minor requirement cannot be used towards meeting the requirement for another major and/ or minor taken by the student.

5. Free Electives

After fulfilling the credit unit requirements for the GE, Major, and Minor (optional), students may choose free electives, and must do so if their cumulative credit load is below 120 credit units, the minimum required for graduation.

BSc in Chemistry
Recommended Study Plan
(For Normative 4-year Degree)

Year 1

Semesters A and B	CUUs	
Gateway Education – University Requirements	9	} For details, please refer to Appendix I - 1
College/School-specified courses	9	
College Requirement	6	
Gateway Education Distributional Requirements		

Year 2

Semester A		CUUs	Semester B		CUUs
CHEM2006	Principles of Inorganic Chemistry	4	CHEM2004	Principles of Analytical Chemistry	4
CHEM2007	Principles of Organic Chemistry	4	CHEM2008	Principles of Physical Chemistry	4
MA2172	Applied Statistics for Sciences and Engineering	3	CHEM2073	Entrepreneurship Programme In Chemistry 1	3
GE2401* +	English for Science	3	GE1401* +	University English	3
Gateway Education Distributional Requirements			GE1501# +	Chinese Civilisation – History and Philosophy	3
Major Elective			Gateway Education Distributional Requirements		
Free Elective			Major Elective		
			Free Elective		

Year 3

Semester A		CUUs	Semester B		CUUs
CHEM3015	Organic Chemistry	4	CHEM3014	Inorganic Chemistry	4
CHEM3027	Analytical Chemistry	4	CHEM3016	Physical Chemistry	4
Gateway Education Distributional Requirements			Gateway Education Distributional Requirements		
Major Elective			Major Elective		
Free Elective			Free Elective		

Year 4

Semester A		CUUs	Semester B		CUUs
Gateway Education Distributional Requirements			Gateway Education Distributional Requirements		
Major Elective			Major Elective		
Free Elective			Free Elective		

Remarks:

- * Students scoring below Level 4 in HKDSE English Language or Grade D in HKALE AS-level Use of English or students who do not possess an equivalent qualification are required to successfully complete the English for Academic Purposes (EAP) courses (LC0200A (3 credit units) and LC0200B (3 credit units)) offered by Chan Feng Men-ling Chan Shuk-lin Language Centre before they can advance to the GE English courses. Students who have achieved a grade B or above in their overall course results for LC0200A will be permitted to exit the programme at this point. They will achieve 3 credit units and also be considered to have satisfied the pre-requisite for entry to the GE English courses.
- # Students scoring below Level 4 in HKDSE Chinese Language, or below Grade D in HKALE AS-level Chinese Language and Culture will be required to successfully complete a Chinese course (totaling 3 credit units) offered by the School of Continuing and Professional Education (SCOPE) before they can advance to the GE Chinese course.
- + Students under the normative 4-year degree are recommended to take these courses in their Year 1 studies.

Note:

1. **In addition to the Major Required Courses, all students must complete the GE English courses of 6 credit units (i.e. GE1401 and GE2401), and 3 credit units of GE1501 Chinese Civilisation – History and Philosophy. Therefore, students are advised to register in these courses as soon as possible.**
2. Normal load per semester is 16 credit units. If students wish to study more than 18 credit units, prior approval from the Department is required.

