Enquiry for Major/Minor/Programme Requirements

Major Title	Major in Chemistry (Intensive)
Offered to students admitted to Year 1 in	**2019-2020**

Objectives:

The Intensive Major in Chemistry aims to provide students with a strong foundation on major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. The curriculum emphasizes comprehensive coverage in theoretical knowledge, laboratory skills, and research experience. A wide selection of elective courses is also available for student preparation to pursue learning in specializations such as chemical biology, computation chemistry, and materials. Graduates of the Intensive Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences. Graduates are expected to be well-prepared for further studies in chemistry and related disciplines and to pursue professional careers in scientific and technical fields.

This intensive major has been accredited by the Royal Society of Chemistry (RSC), UK.

Learning Outcomes:

By the end of this programme, students should be able to:

PLO 1 :	demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
PLO 2 :	demonstrate an in-depth understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical & practical problems (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
PLO 3 :	have developed an awareness & understanding of scientific and ethical issues where chemistry relates to other disciplines, and an appreciation of the impact of chemistry in the modern world (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
PLO 4 :	have substantially developed advanced experimental skills including chemical synthesis, analysis & operation of modern instrumentation, and data analysis skills with the ability to interpret experimental information & infer appropriate conclusions (by requiring of no less than 300 hours of laboratory classes in the curriculum)
PLO 5 :	demonstrate problem-solving skills, critical thinking, creativity & effective written & oral communication skills, and to co-operate with other people & participate as an effective team member (by means of coursework, laboratory-based learning, group project & presentation opportunities in the curriculum)
PLO 6 :	gain experience in working in the real-life industrial or research environment, and enhance their initiative, interpersonal skills, time management skills & project organization skills (by arrangement for chemistry research project of no less than 24 weeks, or student internship opportunities plus directed studies of no less than three weeks with chemistry-related companies or research laboratories)

Impermissible Combination:

Major in Chemistry
Minor in Chemistry

Required courses (144 credits)

1. Introductory level courses (54 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)

Disciplinary Core Courses (36 credits)

CHEM1042	General chemistry I (6)	(Note 1)
CHEM1043	General chemistry II (6)	(Note 1)
CHEM2241	Analytical chemistry I (6)	(Note 1)
CHEM2341	Inorganic chemistry I (6)	(Note 1)
CHEM2441	Organic chemistry I (6)	(Note 1)
CHEM2541	Introductory physical chemistry (6)	(Note 1)

Disciplinary Electives (6 credits)

(Students are encouraged to meet with a Chemistry Course Selection Advisor in the course selection period to discuss which of the following courses they should take based on their previous background in Mathematics.)

CHEM1044	Mathematics in chemistry (6)	
COMP1117	Computer programming (6)	
MATH1011	University mathematics I (6)	
MATH1013	University mathematics II (6)	
STAT1600	Statistics: ideas and concepts (6)	
STAT1601	Elementary statistical methods (6)	Take either STAT1600 or STAT1601 to fulfill this 6 credits requirement, but not both. STAT1600 and STAT1601 are mutually exclusive.
STAT1603	Introductory statistics (6)	Take either STAT1600 or STAT1603 to fulfill this 6 credits requirement, but not both. STAT1600 and STAT1603 are mutually exclusive.

2. Advanced level courses (78 credits)

Disciplinary Core Course (66 credits)

CHEM3143	Introduction to materials chemistry (6)	
CHEM3241	Analytical chemistry II: chemical instrumentation (6)	(Note 1)
CHEM3341	Inorganic chemistry II (6)	(Note 1)
CHEM3441	Organic chemistry II (6)	(Note 1)
CHEM3443	Organic chemistry laboratory (6)	(Note 1)
CHEM3445	Integrated laboratory (6)	
CHEM3541	Physical chemistry: Introduction to quantum chemistry (6)	(Note 1)
CHEM3542	Physical chemistry: statistical thermodynamics and kinetics theory (6)	
CHEM4142	Symmetry, group theory and applications (6)	
CHEM4144	Advanced materials (6)	
CHEM4241	Modern chemical instrumentation and applications (6)	

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

(Note that one of the two elective courses selected must contain a laboratory component. Courses marked with (lab) have a laboratory component. The list of electives given below may be subject to change.)

CHEM4143	Interfacial science and technology (6)	
CHEM4145	Medicinal chemistry (6)	
CHEM4147	Supramolecular chemistry (6)	
CHEM4148	Frontiers in Modern Chemical Science (6)	
CHEM4242	Analytical chemistry (6)	(lab)
CHEM4341	Advanced inorganic chemistry (6)	
CHEM4342	Organometallic chemistry (6)	(lab)
CHEM4441	Advanced organic chemistry (6)	
CHEM4443	Integrated organic synthesis (6)	(lab)
CHEM4444	Chemical biology (6)	
CHEM4542	Computational chemistry (6)	(lab)
CHEM4543	Advanced physical chemistry (6)	
CHEM4544	Electrochemical science and technology (6)	(lab)

3. Capstone requirement (12 credits)

At least 12 credits selected from the following courses:

CHEM3999	Directed studies in chemistry (6)
CHEM4966	Chemistry internship (6)
CHEM4999	Chemistry project (12)

Notes:

1. These are core courses in the regular Chemistry Major (96 credits) curriculum.

2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.

3. As this curriculum is accredited by the Royal Society of Chemistry (RSC), students must follow the curriculum in full (i.e. no replacement courses are possible) in order to graduate with this accredited programme. For students who have credit transfer from exchange studies, for example) a student took CHEM3A and CHEM3B in a host university during his/her exchange studies and these two courses have been approved by the Faculty of Science to be considered equivalent as CHEM3241 and CHEM3341, they will be considered taking those HKU-version courses and in the example shown here, the student is deemed to have taken CHEM3241 and CHEM3341 to fulfil the accredited curriculum.

Remarks:
Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.