

**Chemistry**  
**Applicable to students admitted in 2021-22**

**Major Programme Requirement**

Students are required to complete a minimum of 68 units (72 units for Enrichment Stream, 70 units for Testing and Accreditation Stream) of courses as follows:

	Units
1. Faculty Package (for Major, Enrichment Stream, and Testing and Accreditation Stream): Group B: CHEM1070 Group D: PHYS1001 or 1002 or 1111 A course from the following: Group A: LSCI1000 or 1001 or 1002 or 1012 Group C: MATH1520 (preferred) or 1010 (preferred) or 1018 or 1550 Group E: STAT1011 or 1012	9

**Testing and Accreditation Stream**

2. Required Courses: CHEM1300, 2110, 2120, 2200, 2270, 2300, 2310, 2400, 2860, 2870, 3130, 3220, 3320, 3410, 3420, 3870, 3880, 4010/4020 (capstone courses), 4470	49
3. Elective Courses:	12
(a) Two courses from CHEM3810 or 3830 or 3860	
(b) Three courses from the following lists: <u>Undergraduate electives:</u> CHEM4400, 4440, 4780, 4784, 4786, 4788 ENSC4525#, 4535# <u>CHEM courses at 5000 level</u> (with approval from the Department): CHEM5780, 5784	
(c) One course from the following lists, of which at most one non-CHEM course: <u>Undergraduate electives:</u> CHEM3230, 3340, 4100, 4110, 4200, 4280, 4302, 4630, 4640, 4710, 4730, 4785 <u>CHEM courses at 5000 level</u> (with approval from the Department): CHEM5080, 5301, 5302, 5530, 5540, 5550, 5560, 5620, 5630, 5642, 5660, 5680, 5781, 5782, 5783, 5785, 5910, 5920, 5930 <u>Non-CHEM courses:</u> BCHE3050#, CMBI4002#, ESSC3220#, PHYS3021#, 3022#, 4031#, 4440#	

**Total:** 70

**Explanatory Notes:**

1. CHEM courses at 2000 and above level as well as those labeled as # will be included in the calculation of Major GPA for honours classification.
2. Potential students majoring in Chemistry are strongly recommended to take CHEM1870 as basic training to prepare for laboratory classes in upper years.

3.	A student in the final year of attendance may, <u>under special circumstances</u> and with <u>written</u> approval from the Department, select CHEM4480 and/or 4490 to substitute up to two units of any lecture or laboratory courses in the Chemistry Programme.
[a]	Students may select research-oriented course(s), as approved by the Major Programme, to substitute up to 4 units for fulfillment of Research Courses requirement.
[b]	Students must complete any exchange/research/internship programme(s) offered by the University, Colleges, the Faculty of Science or Major Programme, as approved by the Major Programme, to fulfill the Experiential Learning requirement. Students are responsible for the extra costs incurred in the exchange/research/internship programme(s).

Chemistry (Testing and Accreditation Stream)		
	Recommended Course Pattern	Units
<b>First Year of Attendance</b>	1 <sup>st</sup> term Faculty Package: CHEM1070, PHYS1001 or 1002 or 1111 Major Required: Major Elective(s):	6
	2 <sup>nd</sup> term Faculty Package: a course from Group A, C, E Major Required: CHEM1300 Major Elective(s):	3 2
<b>Second Year of Attendance</b>	1 <sup>st</sup> term Major Required: CHEM2120, 2200, 2300, 2860 Major Elective(s):	12
	2 <sup>nd</sup> term Major Required: CHEM2110, 2270, 2310, 2400, 2870 Major Elective(s):	12
<b>Third Year of Attendance (Pattern A)</b>	1 <sup>st</sup> term Major Required: CHEM3220, 3320, 3410, 3870 Major Elective(s): CHEM3810 or 3830 or 3860	10 2
	2 <sup>nd</sup> term Major Required: CHEM3130, 3420, 3880 Major Elective(s): CHEM3810 or 3830 or 3860, one elective course	7 4
<b>Third Year of Attendance (Pattern B)</b>	1 <sup>st</sup> term Major Required: CHEM3220, 3320, 3410, 3870 Major Elective(s): Two courses from CHEM3810 or 3830 or 3860	10 4
	2 <sup>nd</sup> term Major Required: CHEM3130, 3420, 3880 Major Elective(s): One elective course	7 2
<b>Fourth Year of Attendance</b>	1 <sup>st</sup> term Major Required: CHEM4010, 4470 Major Elective(s): Two courses from CHEM4400 or 4440 or 4780 or 4784 or 4788	2 4-5
	2 <sup>nd</sup> term Major Required: CHEM4020 Major Elective(s): One course from CHEM4400 or 4440 or 4780 or 4784 or 4788	4 2-3
<b>Total (including Faculty Package):</b>		<b>70</b>

### Course List

<i>Course Code</i>	<i>Course Title</i>	<i>Unit(s)</i>
CHEM1070	Principles of Modern Chemistry	3
CHEM1072	General Chemistry	3
CHEM1280	Introduction to Organic Chemistry and Biomolecules	3
CHEM1300	Fundamentals in Physical Chemistry	2
CHEM1380	Basic Chemistry for Engineers	3
CHEM1870	General Chemistry Laboratory	2
CHEM2110	Fundamentals of Spectroscopic Analysis	2
CHEM2120	Main Group Chemistry	2
CHEM2200	Organic Functional Groups: Structure and Reactivity	3
CHEM2270	Student Oriented Teaching	1
CHEM2300	Thermodynamics and Chemical Equilibrium	3
CHEM2310	Atoms and Molecules	3
CHEM2382	Chemistry of Life	2
CHEM2400	Analytical Chemistry	2
CHEM2860	Integrated Chemistry Laboratory I	4
CHEM2870	Integrated Chemistry Laboratory II	4
CHEM3130	Transition Metal Chemistry	3
CHEM3220	Organic Reactions: Reactivity and Selectivity	2
CHEM3230	Conjugated Molecules and Synthetic Polymers	2
CHEM3320	Chemical Kinetics	3
CHEM3340	Materials Chemistry	2
CHEM3410	Instrumental Analysis	3
CHEM3420	Accreditation of Laboratory Tests	2
CHEM3810	Organic Chemistry Laboratory	2
CHEM3820	Advanced Organic Chemistry Laboratory	2
CHEM3830	Physical Chemistry Laboratory I	2
CHEM3840	Physical Chemistry Laboratory II	2
CHEM3860	Transition Metal Chemistry Laboratory	2
CHEM3870	Instrumental Analysis Laboratory	2
CHEM3880	Quality Testing Laboratory	2
CHEM4010	Problem-based Learning in Testing and Accreditation I	0
CHEM4020	Problem-based Learning in Testing and Accreditation II	4
CHEM4030	Problem-based Learning in Chemistry I	0
CHEM4040	Problem-based Learning in Chemistry II	4
CHEM4100	Advanced Inorganic Chemistry	3
CHEM4110	Frontier Organometallic Catalysis	3
CHEM4200	Bioorganic Chemistry and Chemical Biology	2
CHEM4280	Chemistry in Biofuel	2
CHEM4302	Statistical Thermodynamics	2
CHEM4400	Advanced Analytical Chemistry	2
CHEM4440	Food Testing and Environmental Analysis	3
CHEM4470	Internship in Accredited Laboratory	2
CHEM4471	Internship	2
CHEM4480	Undergraduate Special Project I	1
CHEM4490	Undergraduate Special Project II	1
CHEM4630	Asymmetric Organic Synthesis	2
CHEM4640	Pharmaceutical Chemistry	2
CHEM4710	Quantum Chemistry	2

CHEM4730	Special Topics in Chemistry	2
CHEM4780	Mass Spectrometry	2
CHEM4784	Bioanalytical Methods	2
CHEM4785	Industrial Chemistry	2
CHEM4786	Principles and Applications of Coating Chemistry	2
CHEM4788	Chemical Applications in Forensic Science	2
CHEM4960	Research in Chemical Science I	2
CHEM4970	Research in Chemical Science II	2
CHEM4980	Undergraduate Thesis I	0
CHEM4990	Undergraduate Thesis II	4
CHEM5080	Introduction to Macromolecules	2
CHEM5301	Colloids and Surface Chemistry	2
CHEM5302	Statistical Mechanics	2
CHEM5530	Advanced Organometallic Chemistry	2
CHEM5540	Advanced Bioinorganic Chemistry	2
CHEM5550	Organometallic Chemistry of f-Block Elements	2
CHEM5560	Organometallic Chemistry and Catalysis of d-Block Elements	2
CHEM5620	Synthetic Methods in Organic Chemistry	2
CHEM5630	Synthesis of Natural Products	2
CHEM5642	Supramolecular Chemistry	2
CHEM5660	Advanced Organic Chemistry: Structures and Mechanisms	2
CHEM5680	Advanced Chemical Biology	3
CHEM5780	Mass Spectrometry of Biomolecules	2
CHEM5781	Advanced NMR Spectroscopy	2
CHEM5782	Principles of Biomolecular NMR Spectroscopy	2
CHEM5783	Introduction to Laser Spectroscopy	2
CHEM5784	Instrumental Analysis of Biomolecules	2
CHEM5785	Electrochemical Energy Conversion and Storage	2
CHEM5910	Current Topics in Chemistry	2
CHEM5920	Computational Chemistry	2
CHEM5930	Molecular Quantum Mechanics	2
STAR2000	Undergraduate Research in Science I	1
STAR2050	Seminar I	1
STAR3000	Undergraduate Research in Science II	2
STAR3050	Seminar II	1
STAR4000	Undergraduate Research in Science III	3
STAR4050	Seminar III	1