

Chemistry
Applicable to students admitted in 2017-18

Major Programme Requirement

Students are required to complete a minimum of 58 units (70 units for Enrichment Stream, 64 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 C: MATH1520 (preferred) or 1010 or 1550 A course from the following Group A: LSCI1000 or 1001 or 1002 Group D[a]: PHYS1001 or 1002 or 1111 Group E: STAT1011 or 1012 | 9 |
| 2. Required Courses: CHEM2120, 2200[e], 2270, 2300[e], 2310[e], 2320, 2400, 2408, 2820, 2830, 2850, 3130[e], 3220, 3320[e], 3410[e], 3810, 3830, 3860, 3870 | 37 |
| 3. Elective Courses: | 12 |
| (a) One combination from: CHEM3230/3820 or CHEM3330/3840 | |
| (b) One combination from: CHEM4030/4040 or CHEM4980/4990 (with approval from the Department) | |
| (c) Two courses from the following lists, of which at most one non-CHEM course: <u>Undergraduate electives:</u> CHEM4100, 4200, 4302, 4400, 4430, 4440, 4630, 4640, 4710, 4720, 4730, 4780, 4781, 4784, 4785, 4788 <u>CHEM courses at 5000 level</u> (with approval from the Department): CHEM5080, 5301, 5302, 5530, 5540, 5550, 5560, 5620, 5630, 5642, 5660, 5680, 5780, 5781, 5782, 5783, 5784, 5910, 5930 <u>Non-CHEM courses:</u> BCHE4010#, CMBI4002#, ENSC4525#, 4535#, ESSC3220#, PHYS3021#, 3022#, 4031# | |
| Total: | 58 |

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, under special circumstances and with written 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] All Chemistry students are required to take at least one course from PHYS1001, 1002 and 1111, including the ones listed under the Faculty Package.
- [b] Students who have taken both CHEM4780 and 4784 can use one of the courses to fulfill the Elective Courses requirement as prescribed in 3(c).

- [c] 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.
- [d] 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).
- [e] Course units of the following CHEM courses will be revised from 2 to 3 units with effect from the academic year listed below. Students admitted before 2019-20 should have already taken these courses before the revision.

| Courses | Effective year |
|-------------------------|----------------|
| CHEM2200, 2300 and 2310 | 2020-21 |
| CHEM3130, 3320 and 3410 | 2021-22 |

| Chemistry | | |
|---|---|-----------|
| | Recommended Course Pattern | Units |
| First Year of Attendance | 1 st term Faculty Package: CHEM1070 Major Required: Major Elective(s): | 3 |
| | 2 nd term Faculty Package: MATH1520 or 1010 or 1550; a course from Group A, D, E Major Required: Major Elective(s): | 6 |
| Second Year of Attendance | 1 st term Major Required: CHEM2120, 2200*, 2310*, 2820, 2850 Major Elective(s): | 10 |
| | 2 nd term Major Required: CHEM2270, 2300*, 2320, 2400, 2408, 2830 Major Elective(s): | 11 |
| Third Year of Attendance | 1 st term Major Required: CHEM3220, 3320*, 3410*, 3810, 3830, 3870 Major Elective(s): | 12 |
| | 2 nd term Major Required: CHEM3130*, 3860 Major Elective(s): CHEM3230, 3820 (or 3330, 3840) | 4 4 |
| Fourth Year of Attendance | 1 st term Major Required: Major Elective(s): CHEM4030 (or 4980), one elective course | 2 |
| | 2 nd term Major Required: Major Elective(s): CHEM4040 (or 4990), one elective course | 6 |
| Total (including Faculty Package): | | 58 |

*Refer to explanatory note [e].

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 |
| CHEM1380 | Basic Chemistry for Engineers | 3 |
| CHEM1870 | General Chemistry Laboratory | 2 |
| CHEM2120 | Main Group Chemistry | 2 |
| CHEM2200* | Organic Functional Groups: Structure and Reactivity | 2 |
| CHEM2270 | Student Oriented Teaching | 1 |
| CHEM2300* | Thermodynamics and Chemical Equilibrium | 2 |
| CHEM2310* | Chemical Bonding | 2 |
| CHEM2320 | Fundamentals of Spectroscopic Analysis | 2 |
| CHEM2382 | Chemistry of Life | 2 |
| CHEM2400 | Analytical Chemistry | 2 |
| CHEM2408 | Analytical Chemistry Laboratory I | 2 |
| CHEM2820 | Organic Chemistry Laboratory I | 2 |
| CHEM2822 | Introductory Organic Chemistry Laboratory | 1 |
| CHEM2830 | Physical Chemistry Laboratory I | 2 |
| CHEM2850 | Inorganic Chemistry Laboratory I | 2 |
| CHEM3130* | Transition Metal Chemistry | 2 |
| CHEM3220 | Organic Reactions: Reactivity and Selectivity | 2 |
| CHEM3230 | Physical Organic Chemistry and Aromatics | 2 |
| CHEM3320* | Chemical Kinetics | 2 |
| CHEM3330 | Molecular Spectroscopy | 2 |
| CHEM3410* | Instrumental Analysis | 2 |
| CHEM3810 | Organic Chemistry Laboratory II | 2 |
| CHEM3820 | Organic Chemistry Laboratory III | 2 |
| CHEM3830 | Physical Chemistry Laboratory II | 2 |
| CHEM3840 | Physical Chemistry Laboratory III | 2 |
| CHEM3860 | Inorganic Chemistry Laboratory II | 2 |
| CHEM3870 | Analytical Chemistry Laboratory II | 2 |
| CHEM4030 | Problem-based Learning I | 0 |
| CHEM4040 | Problem-based Learning II | 4 |
| CHEM4100 | Advanced Inorganic Chemistry | 2 |
| CHEM4200 | Organic Chemistry in Life | 2 |
| CHEM4302 | Statistical Thermodynamics | 2 |
| CHEM4400 | Advanced Analytical Chemistry | 2 |
| CHEM4430 | Accreditation of Laboratory Tests | 2 |
| CHEM4440 | Food Testing and Environmental Analysis | 2 |
| CHEM4470 | Internship in Accredited Laboratory | 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 |
| CHEM4720 | Molecular Modelling | 2 |
| CHEM4730 | Special Topics in Chemistry | 2 |
| CHEM4780 | Mass Spectrometry | 2 |
| CHEM4781 | NMR Spectroscopy | 2 |
| CHEM4784 | Bioanalytical Methods | 2 |
| CHEM4785 | Industrial 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 | Organolanthanide Chemistry | 2 |
| CHEM5560 | Organometallic Chemistry and Catalysis | 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 | Introduction to Chemical Biology | 2 |
| 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 |
| CHEM5910 | Current Topics in 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 |

*Refer to explanatory note [e].