University of Pretoria Yearbook 2019

BScHons Chemistry (02240123)

Minimum duration of study	1 year
Total credits	135

Programme information

Renewal of registration

i. Subject to exceptions approved by the Dean, on the recommendation of the relevant head of department, and in the case of distance education where the Dean formulates the stipulations that will apply, a student may not sit for an examination for the honours degree more than twice in the same module.
ii. A student for an honours degree must complete his or her study, in the case of full-time students, within two years and, in the case of after-hours students, within three years of first registering for the degree and, in the case of distance education students, within the period stipulated by the Dean. Under special circumstances, the Dean, on the recommendation of the relevant head of department, may give approval for a limited extension of this period.

In calculating marks, General Regulation G.12.2 applies.

Apart from the prescribed coursework, a research project is an integral part of the study.

Admission requirements

An appropriate BSc degree with at least 60% for Chemistry at 300-level.

Examinations and pass requirements

A final mark of 50% for each module. To continue to a second semester, a minimum of 40% is required in each module in the first semester. The registration of students who do not meet this requirement will be terminated at the end of the first semester.

Pass with distinction

The BScHons degree is awarded with distinction to a candidate who obtains a weighted average of at least 75% in all the prescribed modules and a minimum of 65% in any one module.

Curriculum: Final year

Minimum credits: 135

Minimum credits: 135

Core modules

Analytical chemistry A 706 (CMY 706)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	1 discussion class per week for 4 weeks, 6 lectures per week for 4 weeks
Language of tuition	Module is presented in English
Department	Chemistry
Period of presentation	Semester 1 or Semester 2

Module content

Selected aspects of: Mass spectometry: ion sources, analysers, detectors, isotope ratios, accurate mass, ion fragmentation, tandem mass spectrometry. Chromatography: theory and instrumentation of gas, liquid and supercritical fluid chromatography, multidimensional systems and coupling to mass spectrometry.

Analytical chemistry B 707 (CMY 707)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	1 discussion class per week for 4 weeks, 6 lectures per week for 4 weeks
Language of tuition	Module is presented in English
Department	Chemistry
Period of presentation	Semester 1 or Semester 2

Module content

Selected aspects: Electrochemistry: fundamental theory, voltammetry, metal-ligand equilibria, modelling and measurement of solution composition. Statistics: precision and accuracy, random errors, hypothesis testing, method of least squares, curve fitting, multivariate statistics, interpreting patterns of data. Chemical metrology: propagation of errors, quality control of quantitative and qualitative analytical information, international standards, interlaboratory calibration

Organic chemistry A 708 (CMY 708)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	6 lectures per week for 4 weeks, 1 discussion class per week for 4 weeks
Language of tuition	Module is presented in English

Department	Chemistry
Period of presentation	Semester 1 or Semester 2

Module content

Stereocontrolled organic synthesis: substrate stereocontrol in diastereoselective synthesis. Retrosynthesis: principles and applications. Protecting groups in synthesis. Aromatic and heteroaromatic chemistry.

Organic chemistry B 709 (CMY 709)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	6 lectures per week for 4 weeks, 1 discussion class per week for 4 weeks
Language of tuition	Module is presented in English
Department	Chemistry
Period of presentation	Semester 1 or Semester 2

Module content

Stereocontrolled organic synthesis: chiral auxiliaries in synthesis; reagent controlled synthesis; catalyst controlled synthetic methods. Pericyclic reactions and transition metals in organic synthesis. Aliphatic and heterocyclic amine chemistry.

Inorganic chemistry A 714 (CMY 714)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	6 lectures per week for 4 weeks, 1 discussion class per week for 4 weeks
Language of tuition	Module is presented in English
Department	Chemistry
Period of presentation	Semester 1 or Semester 2

Module content

Inorganic and organometallic chemistry. Classification of ligands and complexes. Synthesis, structure, bonding and reactivity of complexes. Homogeneous catalysis and template effects.

Inorganic chemistry B 715 (CMY 715)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	6 lectures per week for 4 weeks, 1 discussion class per week for 4 weeks
Language of tuition	Module is presented in English
Department	Chemistry
Period of presentation	Semester 1 or Semester 2

Module content

Main group chemistry. From complexes to clusters to networks. Reaction kinetics and mechanisms. Supramolecular chemistry Bioinorganic and bioorganometallic compounds. Metals in medicine.

Physical chemistry A 716 (CMY 716)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	1 discussion class per week for 4 weeks, 6 lectures per week for 4 weeks
Language of tuition	Module is presented in English
Department	Chemistry
Period of presentation	Semester 1 or Semester 2

Module content

Crystallography: theoretical principles, symmetry elements and operations, point groups, space groups, theory of crystals, X-rays, crystallographic techniques, structure determinations, powder diffraction and crystallographic data bases.

Molecular modelling: molecular structure/energy, methodology, principles and and molecular surfaces.

Physical chemistry B 717 (CMY 717)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	1 practical per week for 7 weeks, 6 lectures per week for 4 weeks
Language of tuition	Module is presented in English
Department	Chemistry
Period of presentation	Semester 1 or Semester 2

Module content

Chemical kinetics: rates of chemical reactions, equilibrium reactions, temperature dependence of reactions, complex reactions, reaction mechanisms and kinetics by thermal analysis. Statistical mechanics: Boltzmann distribution, partition functions, ensembles, thermodynamic functions, equilibria.

Research: Organic/inorganic project Part 1 718 (CMY 718)

Module credits	20.00
Prerequisites	No prerequisites.
Contact time	1 seminar per week, 1 practical per week for 7 weeks
Language of tuition	Module is presented in English
Department	Chemistry
Period of presentation	Semester 1 and Semester 2

Module content
Students work on one project during the year which has a significant component that can be described as instrumental or computational or analysis of data or theoretical. A report and a presentation are required.

Research: Physical/analytical project Part 2 719 (CMY 719)

Module credits	20.00
Prerequisites	No prerequisites.
Contact time	1 practical per week for 7 weeks
Language of tuition	Module is presented in English
Department	Chemistry
Period of presentation	Semester 1 and Semester 2

Module content

Students work on one project during the year which has a significant component that can be described as instrumental or computational or analysis of data or theoretical. A report and a presentation are required.

Advanced practical techniques 730 (CMY 730)

Module credits	15.00
Prerequisites	No prerequisites.
Contact time	5 tutorials per week for 6 weeks, 5 lectures per week for 6 weeks
Language of tuition	Module is presented in English
Department	Chemistry
Period of presentation	Year

Module content

Chemical information literacy; Molecular modelling; NMR spectroscopy; Mass spectrometry; Crystallography and Metrology will be presented from a practical point of view with an emphasis on the interpretation of data and use of instrumentation rather than on underlying theory.

The information published here is subject to change and may be amended after the publication of this information. The General Regulations (G Regulations) apply to all faculties of the University of Pretoria. It is expected of students to familiarise themselves well with these regulations as well as with the information contained in the General Rules section. Ignorance concerning these regulations and rules will not be accepted as an excuse for any transgression.