

MSc Chemistry (Full time) – SC521

1. Specific Titles:

- (1) MSc Chemistry
- (2) Post Graduate Diploma in Chemistry

2. Objectives

The main objective of this Programme is to cater for graduates who wish to have better career prospects and to enhance their knowledge in new spheres of Chemistry. Students will also acquire new skills and techniques.

Students will be educated to a level that will enable them to have in-depth knowledge and to perform adequately in any area of Chemistry. It is also expected that the candidates will be able to apply in practice the principles covered in the Programme and demonstrate awareness in all the main areas of Chemistry. Last but not least, students will enhance their opportunity for further studies.

3. General Entry Requirements

Successful completion of an undergraduate degree with

- at least a Second Class or 50%, whichever is applicable or
- a GPA not less than 2.5 out of 4 or equivalent, from a recognised higher education institution.

OR alternative qualifications acceptable to the University of Mauritius.

4. Programme Requirements

BSc (Hons) Chemistry or BSc (Joint Hons) Degree with Chemistry as one of the subjects or equivalent qualifications acceptable to the University of Mauritius.

5. Programme Duration

The programme will be offered on a full-time basis.

	Normal	Maximum
Master's Degree:	15 months	2 Years
Postgraduate Diploma:	1 Year	2 Years

6. Credits per Semester: Minimum 3 credits subject to regulation 5.

7. Minimum Credits Required for Award

Master's Degree: 36
Postgraduate Diploma: 26

Breakdown as follows:

(i) MSc Chemistry: 36

Core modules: 20 credits
+ Project: 10 credits
+ Elective modules: 6 credits

(ii) **Postgraduate Diploma in Chemistry: 26**

Core modules: 20 credits
+ Elective modules: 6 credits

8. Assessment

Each module will carry 100 marks and will be assessed as follows (unless otherwise specified):

Assessment will be based on a written examination of 3-hour duration and continuous assessment carrying a range of 10% to 30% of total marks. Continuous assessment may be based on laboratory works, and/or assignments and should include at least 1 class test.

An overall total of 40% for combined continuous assessment and written examination components would be required to pass the module, without minimum thresholds within the individual continuous assessment and written examination.

9. List of Modules

Code	Module Name	Hrs/Wk L+P	Credits
CORE			
CHEM 4000Y(5)	Research Project	-	10
CHEM 4011Y(5)	Advanced Organic Chemistry	75+0	5
CHEM 4021Y(5)	Advanced Physical Chemistry	75+0	5
CHEM 4031Y(5)	Advanced Inorganic Chemistry	75+0	5
CHEM 4041Y(5)	Advanced Analytical Chemistry	75+0	5
ELECTIVES			
CHEM 4064Y(5)	Marine Sciences	45+0	3
FRSC 3002Y(5)	Forensic Biology and DNA Profiling	37.5+15	3
CHEM 4066Y(5)	Food Science	45+0	3
CHEM 4067Y(5)	Chemical Modelling and Bioinformatics	45+0	3
CHEM 4068Y(5)	Advanced Polymer Science	45+0	3

and/or any new modules offered by the Department

NOTE: NOT ALL ELECTIVES MAY BE ON OFFER

10. Outline Syllabus

CHEM 4000Y(5) - RESEARCH PROJECT/DISSERTATION

Students will normally undertake a research project of their choice under the guidance of a supervisor. Project work is to be viewed as an introduction to the exciting task of generating new knowledge. During the course of the project the student will learn standard and advanced experimental techniques, how to analyse data and write up scientific reports.

CHEM 4011Y(5) - ADVANCED ORGANIC CHEMISTRY

Chemical aspects of biosynthetic pathways of secondary metabolites from the shikimate, polyketide and alkaloid families as well as of mixed origins, total synthesis approach of some organic natural products e.g terpenes and prostaglandins, introduction to medicinal chemistry (chemistry of pharmaceutical drugs, drug metabolisms, drug targeting) photochemistry (free radical chemistry, electronic excitation and de-excitation of organic molecules, state energy diagrams, reaction mechanisms, applications of photochemistry definition, derivation and use of the Stern-Volmer equation.

CHEM 4021Y(5) - ADVANCED PHYSICAL CHEMISTRY

Advanced Kinetics, Spectroscopy (X-ray, NMR, ESR, Fluorescence), equilibrium between phases and irreversible thermodynamics, their fundamentals and applications.

CHEM 4031Y(5) - ADVANCED INORGANIC CHEMISTRY

Advanced organometallics and catalysis, clusters, advanced coordination chemistry, inorganic spectroscopy, metals in medicine.

CHEM 4041Y(5) - ADVANCED ANALYTICAL CHEMISTRY

Review of main techniques for trace analysis including spectrophotometry, fluorometry, atomic spectrometry, chromatography (GC, GC/MS, HPLC, ion-exchange, etc.), electroanalytical techniques, thermal and others. Application of these selected methods for the analysis of atmospheric, water and soil samples for the determination of trace amounts of pollutants.

Review of methods for chemical analysis of foodstuffs and agricultural products with special reference to metals in food, chemical food poisoning, oil and fat content of food, sugar and carbohydrate determination, detection of selected chemicals in fish and meat, pesticides in fruits and vegetables, drug analysis, integrated chemical management and other topics.

CHEM 4064Y(5) - MARINE SCIENCES

Chemical processes in the marine environment, ocean circulation and water dynamics, estuarine and coastal processes, marine resources, ocean productivity, marine ecosystems, toxicity, marine pollution and pathways, marine protected areas, integrated coastal zone management, hazards and risk management, land based oceanic and seafood industry.

CHEM 4066Y(5) - FOOD SCIENCE

Classification, chemical structure and properties of food constituents, chemical composition, properties and nutritional value of food commodities, primary sensory attributes of foods and perception of food quality, types of nutrients and their role in health promotion and disease prevention, dietary guidelines and healthy eating, microbial food spoilage, microbial food-borne diseases, useful micro-organisms, factors which affect food quality and safety, food hazards, food hygiene, codes of practice/guidelines to ensure food quality and safety, traceability, importance of food safety management throughout the food chain. principles and methods of food preservation including high-temperature processing, low-temperature processing, moisture removal and irradiation, food packaging.

CHEM 4067Y(5) - CHEMICAL MODELLING AND BIOINFORMATICS

Introduction, molecular mechanics, force fields, Hartree-Fock and beyond, Basis set, semi-empirical methods, density functional theory, applications, introduction to DNA, introduction to bioinformatics – internet and biological databases, sequence database, macromolecular structure databases (PDB files), interrogating databases, sequence analysis, alignment, phylogeny, homology search, study and analysis of macromolecular structures, basic manipulation of macromolecular structures.

CHEM 4068Y(5) - ADVANCED POLYMER SCIENCE

Living polymerization: free-radical, cationic and ionic, ROMP; metallocene polymerization; liquid crystals; high performance polymers; biopolymers and polysaccharides; advanced characterization techniques (TEM, AFM, DLS/FFF, MALDI-TOF), polymer rheology and processing.

FRSC 3002Y(5) - FORENSIC BIOLOGY AND DNA PROFILING

Examination of body fluids (blood, semen, saliva), Forensic DNA analysis and DNA profiling, forensic anthropology, the role and use of entomology in post mortem and /or any other topics.

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