

2020/1 - CHE-4001Y CHEMISTRY LABORATORY

Full Year, Level 4 module

(Maximum 80 Students)

UCU: 20

Organiser: Dr Anna Fuller

(UG) MODULE - 40% PASS ON AGGREGATE

Module Type: Coursework

Timetable Slot: B1-D1, E2-C3

WHILE TAKING THIS MODULE YOU MUST TAKE CHE-4101Y OR TAKE CHE-4301Y

IN TAKING THIS MODULE YOU CANNOT TAKE CHE-4602Y

You will be laboratory based to cover experimental aspects of the 'core' chemistry courses, Chemistry of Carbon-based Compounds, Bonding, Structure and Periodicity, Light, Atoms and Materials and Analytical Chemistry. You will use spreadsheets for analysing and presenting data, which is also covered in this module.

2020/1 - CHE-4202Y LIGHT, ATOMS AND MOLECULES

Full Year, Level 4 module

(Maximum 120 Students)

UCU: 20

Organiser: Professor Stephen Ashworth

(UG) MODULE - 40% PASS ON AGGREGATE

Module Type: Examination with Coursework or Project

Timetable Slot: C2*H3/, U

Exam Paper(hrs):2

This module introduces students to the major areas of classical physical chemistry: chemical kinetics, chemical thermodynamics, and electrolyte solutions as well as spectroscopy. Chemical kinetics will consider the kinetic theory of gases and the rate of processes, in particular either in the gas phase or in solution. The appropriate theoretical basis for understanding rate measurements will be developed during the course, which will include considerations of the order of reaction, the Arrhenius equation and determination of rate constants. Thermodynamics deals with energy relationships in large assemblies, that is those systems which contain sufficient numbers of molecules for 'bulk' properties to be exhibited and which, are in a state of equilibrium. Properties discussed will include the heat content or enthalpy (H), heat capacity (Cp, Cv), internal energy (U), heat and work. The First Law of Thermodynamics will be introduced and its significance explained. It is very important that scientists have an understanding of the behaviour of ions in solution, which includes conductivity and ionic mobility. The interaction of radiation with matter is termed spectroscopy. Three main topics will be discussed: (i) ultraviolet/visible (UV / Vis) spectroscopy, in which electrons are moved from one orbital to another orbital; (ii) infrared (vibrational) spectroscopy, a technique which provides important information on the variety of bond types that a molecule can possess; (iii) nuclear magnetic resonance spectroscopy (NMR), which allows 'molecular skeletons' to be identified.

2020/1 - CHE-4301Y BONDING, STRUCTURE & PERIODICITY

Full Year, Level 4 module
(Maximum 999 Students)

UCU: 20

Organiser: Professor Simon Lancaster

(UG) MODULE - 40% PASS ON AGGREGATE

Module Type: Examination with Coursework or Project

Timetable Slot:F2*D3/, U

Exam Paper(hrs):2

Exam Period:SPR-02

After a shared introduction to chemical bonding, atomic and molecular structure and chemical principles, this module will provide you with an introduction to the structures, properties and reactivities of molecules and ionic solids. The first few lectures of this module are integrated with the module 'Chemistry of Carbon Based Compounds' and is supported and illustrated by the bonding, structure and periodicity experiments of the first year practical modules, Chemistry Laboratory A or Research Skills in Biochemistry. The latter part will concentrate more on fundamental aspects of inorganic Chemistry. Emphasis will be placed on the relationships between chemical bonding and the structures and properties of molecules.

2020/1 - CHE-4501Y ANALYTICAL CHEMISTRY

Full Year, Level 4 module
(Maximum 80 Students)

UCU: 20

Organiser: Dr Anna Fuller

(UG) MODULE - 40% PASS ON AGGREGATE

Module Type: Examination with Coursework or Project

Timetable Slot:G1\, D3\

Exam Paper(hrs):

Exam Period:SPR-02

Introducing important concepts in analytical chemistry, this module covers a range of qualitative and quantitative analytical techniques that underpin more complex instrumental analytical methodologies. Exploring these techniques, you will learn how to apply them to "real-life" analytical problems.

2020/1 - CHE-4602Y RESEARCH SKILLS IN BIOCHEMISTRY

Full Year, Level 4 module
(Maximum 70 Students)

UCU: 20

Organiser: Dr Tharin Blumenschein

(UG) MODULE - 40% PASS ON AGGREGATE

Module Type: Coursework

Timetable Slot:B1-D1

WHILE TAKING THIS MODULE YOU MUST TAKE CHE-4101Y OR TAKE CHE-4301Y
IN TAKING THIS MODULE YOU CANNOT TAKE CHE-4001Y

(UG) MODULE - 40% PASS ON AGGREGATE
Module Type: Examination with Coursework or Project
Timetable Slot: B2, A1-F1, E2, H2/
Exam Paper(hrs): 2 Exam Period: SPR-02

BEFORE TAKING THIS MODULE YOU MUST TAKE BIO-4007Y OR TAKE CHE-4202Y

This module will equip you with an understanding of the principles and techniques used in contemporary biophysical chemistry. You will learn experimental techniques for measuring thermodynamic and kinetic properties of biological molecules. You will gain firm grounding in the physical principles describing those properties and their use to provide quantitative descriptions of those properties. Using predominantly examples from protein biochemistry you will explore three major themes; i) spectroscopic properties of biomolecules, ii) thermodynamic and kinetic properties of proteins and enzymes, and, iii) methods defining biomolecule size and mass. Through weekly seminars you will benefit from putting your knowledge into practice, communicating your ideas and growing your confidence in quantitative data analysis and problem solving. During laboratory-based practical work, you will develop your skills in sample preparation together with the collection and interpretation of spectroscopic data. Your participation in this module will give you the knowledge to appreciate how, and why, biophysical chemistry contributes to advances in medicine, sustainable energy solutions and healthy ageing.

2020/1 - CHE-6001Y RESEARCH PROJECT

Full Year, Level 6 module
(Maximum 30 Students)
UCU: 40 Organiser: Dr Vasily Oganessian
(UG) MODULE - 40% PASS ON AGGREGATE
Module Type: Project
Timetable Slot: U

IN TAKING THIS MODULE YOU CANNOT TAKE CHE-6002Y

A supervised research project.

2020/1 - CHE-6002Y LITERATURE-BASED PROJECT

Full Year, Level 6 module
(Maximum 20 Students)
UCU: 20 Organiser: Dr Vasily Oganessian
(UG) MODULE - 40% PASS ON AGGREGATE
Module Type: Project
Timetable Slot: U

IN TAKING THIS MODULE YOU CANNOT TAKE CHE-6001Y

A supervised literature-based project.

Exam Paper(hrs):2

Exam Period:SPR-02

BEFORE TAKING THIS MODULE YOU MUST TAKE CHE-4101Y AND TAKE CHE-5101A

You will cover several key topics required to plan the synthesis of organic compounds, and to understand the properties displayed by organic compounds. The first topic is on synthesis planning, strategy and analysis, supported by a study of further important oxidation and reduction reactions. The second topic is on the various types of pericyclic reactions and understanding the stereochemistry displayed by an analysis of frontier orbitals. The third topic is on the use of organometallic compounds in synthesis with a particular emphasis on the use of transition metal-based catalysts. The fourth topic is the synthesis of chiral non-racemic compounds, and describes the use of chiral pool compounds and methods for the amplification of chiral information, including asymmetric reductions and oxidations. The final topic is on physical organic chemistry and includes aspects of radical chemistry.

2020/1 - CHE-6151Y TOPICS IN ORGANIC CHEMISTRY

Full Year, Level 6 module
(Maximum 30 Students)

UCU: 20

Organiser: Dr Sean Bew

(UG) MODULE - 40% PASS ON AGGREGATE

Module Type: Examination with Coursework or Project

Timetable Slot:H2/*G1/

Exam Paper(hrs):2

BEFORE TAKING THIS MODULE YOU MUST TAKE CHE-5101A
IN TAKING THIS MODULE YOU CANNOT TAKE CHE-7150Y

This module is to provide an awareness of new bond construction in advanced organic chemistry. It has aspects of natural product chemistry and the associated bioactivity of natural compounds. The module will illustrate how advanced synthetic chemistry can be used to construct compounds that might find applications in the pharmaceutical industry.

2020/1 - CHE-6250Y CHEMICAL PHYSICS - PHYSICAL CHEMISTRY

Full Year, Level 6 module
(Maximum 30 Students)

UCU: 20

Organiser: Professor Steve Meech

(UG) MODULE - 40% PASS ON AGGREGATE

Module Type: Examination with Coursework or Project

Timetable Slot:D2*C3*

Exam Period:SPR-02

BEFORE TAKING THIS MODULE YOU MUST TAKE CHE-5201Y OR TAKE CHE-5250Y OR TAKE PHY-5001Y

The module will consist of topics covering important areas of modern physical chemistry and

The structural basis of the function of many proteins has been elucidated and this, together with the ready availability of chemical and biochemical techniques for altering proteins in a controlled way, has led to the application of proteins in a wide variety of biological and chemical systems and processes. These include their use as industrial catalysts and medicines, in organic syntheses and in the development of new materials. This module provides an introduction to the principles underlying this rapidly expanding and commercially-relevant area of the molecular biosciences and gives insights into their applications.