

Module Details	
Module Title	Chemistry for Clinical Sciences
Module Code	CLS3003-B
Academic Year	2020/1
Credits	20
School	School of Pharmacy and Medical Sciences
Subject Area	Clinical Sciences
FHEQ Level	RQF Level 3
Pre-requisites	N/A
Co-requisites	N/A

Contact Hours	
Type	Hours
Online Lecture (Synchronous)	25
Learning Objects Interaction	5
Online Tutorials (Synchronous)	19
Directed Study	10
Independent Study	141

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Academic Year

Module Aims
To reinforce basic knowledge of general chemistry and extend it to cover more advanced aspects of bonding and organic chemistry. To extend this knowledge base through the study of the concepts of enthalpy changes; general and aqueous equilibrium; acids, bases, pH and buffers; and simple organic reactions with reference to a biological or medical context.

Outline Syllabus

Atomic structure: nuclear and electronic (up to s,p,d orbitals). Chemical equations. Mole concept, relative atomic/molar masses, molar volume, reacting masses, molar conc. Intramolecular bonding: ionic, covalent, dative, electronegativity, polarity. Intermolecular bonding: hydrogen, Van der Waals bonding. Nature of organic chemistry: alkanes, alkenes, arenes. Organic functional groups (halogen, alcohol, aldehyde, ketone, carboxylic acid, ester and amine). Isomerism: structural, geometric and optical. Principles of organic nomenclature. Enthalpy and entropy changes. Hess' Law. Rate equations. Catalysts including enzymes. Activation energy. Equilibrium, equilibrium constant (K_c), Le Chatelier's Principle. Effect of concentration, pressure and temperature. Strong and weak acids and bases. Acid ionisation constant of weak acids. Buffer solutions. Calculation of pH. Principles of organic reaction mechanisms. Simple reactions of alkenes, alcohols, carboxylic acids and amines. Structure determination of organic molecules.

Learning Outcomes

Outcome Number	Description
01	Describe the key features of the structure of atoms, chemical bonding, molecular structure, and organic reactions.
02	Explain the properties of biomolecules, metabolic processes, and medical treatments in terms of chemical structure, bonding and reactivity.
03	Explain the factors affecting the energy changes, rate and equilibrium position of a reaction, and their relevance to biochemical reactions in the human body.
04	Apply principles of physical chemistry to solve numerical problems involving chemical quantities, thermochemistry, reaction kinetics, equilibria, and acid-base chemistry.
05	Describe and apply scientific concepts.
06	Use logical thinking skills.
07	Use study, written communication and numeracy skills.

Learning, Teaching and Assessment Strategy

Information outlining the knowledge and understanding required of this module is delivered in lectures. Problem-solving tutorials will be used to practise and reinforce the taught component and further exercises for practice and revision in directed study time will be made available throughout the year. Feedback during tutorials and in formative assessment will enable you to monitor your progress. You will use your independent study time to access suggested resources for further reading, to practice problem solving and to monitor and direct your own learning. Your knowledge base, problem-solving and numeracy skills will be assessed by examinations at the end of each semester.

Mode of Assessment

Type	Method	Description	Length	Weighting
Summative	Computer-based assessment	Online assessment (MCQ and calculations assessment)	1 hour 30 mins	60%
Summative	Computer-based assessment	Online MCQ End of Semester 1	1 hour	40%

Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

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