

Chemistry for Clinical Sciences

Module Code:	CLS3003-B
Academic Year:	2018-19
Credit Rating:	20
School:	School of Pharmacy and Medical Sciences
Subject Area:	Clinical Sciences
FHEQ Level:	FHEQ Level 3

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Lectures	29
Tutorials	24
Directed Study	147

Availability Periods

Occurrence	Location/Period
BDA	University of Bradford / Academic Year (Sept - May)

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. (Bio)chemistry of amino acids and proteins.

Module Learning Outcomes

On successful completion of this module, students will be able to...

- 1 Describe the key features of the structure of atoms, chemical bonding, molecular structure, and organic reactions.
- 2 Explain the properties of biomolecules, metabolic processes, and medical treatments in terms of chemical structure, bonding and reactivity.
- 3 Explain the factors affecting the energy changes, rate and equilibrium position of a reaction, and their relevance to biochemical reactions in the human body.
- 4 Apply principles of physical chemistry to solve numerical problems involving chemical quantities, thermochemistry, reaction kinetics, equilibria, and acid-base chemist.
- 5 Describe and apply scientific concepts.
- 6 Use logical thinking skills.
- 7 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 workshops and tutorials will be used to practise and reinforce the taught component. Feedback during workshops and in formative assessment will enable you to monitor your progress. You will use your directed 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	Final Assess'
Summative	Examination - MCQ	One 1 hour MCQ examination End of Semester 1	1 hour	40%	No

Summative	Examination - MCQ	One 1.5 Hours closed book MCQ and Calculations examination End of Semester 2.	1.5 hours	60%	Yes
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Legacy Code (if applicable)

CS-0011L

Reading List

To view Reading List, please go to [rebus:list](#).