UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Chemistry
Module Code	BIC3009-A
Academic Year	2022/3
Credits	10
School	UoB International College
FHEQ Level	RQF Level 3

Contact Hours	
Type	Hours
Directed Study	50
Lectures	40
Laboratories	10

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2
BDA	University of Bradford / Semester 3

Module Aims

The module will provide students with an introduction to post-High School Chemistry and provide the knowledge fundamental to further study. The module aims to provide a stimulating learning experience in the basic theoretic principles of the subject. The module also introduces students to laboratory practice and procedures with an emphasis on the need to work safely.

Outline Syllabus

Formulae, equations and moles - Full and ionic equations, reacting masses calculations including yield. Empirical formulae. The mole concept. Relative atomic/molar masses. Avogadro number of formula units in a mole. The molar gas volume. The concentration of solutions, leading to acid/base titrimetry.

Atomic Structure - Sub-atomic particles. Relative masses, isotopy, use of mass spectrometer to determine isotopes. Electrons in shells, sub-shells and orbitals. Ionisation energies. Electron affinity. Relating chemical behaviour of atoms to electron structure.

Introduction to redox - Oxidation number, redox reactions, oxidising and reducing agents. Ionic half equations and full equations for redox processes. Titrimetry involving the use of potassium manganite (VII) and iodine/thiosulphate.

Thermodynamics - Enthalpy changes, standard conditions. Definitions of enthalpy of formation, combustion and neutralisation. Hess's law. Simple calorimetry. Lattice enthalpy. Born Haber cycles. Bond enthalpy. Entropy, Gibb's equation, feasibility.

Bonding - Ionic, covalent, dative covalent, metallic bonds. Electronegativity and Fajans's rules. Polar bonds and polar molecules. Intermolecular forces including hydrogen bonds. Shapes of simple molecules and ions using valence shell electron pair repulsion theory. Relationship of structure and bonding to properties of materials.

Learning Outcomes

Outcome Number	Description
1	Describe the basis of atomic and molecular structure and chemical bonding.
2	Explain the differences in properties between ions and molecules.
3	Use the mole concept and balance chemical equations.
4	Demonstrate the basic principles of chemical energy.
5	Describe the principles of redox reactions.
6	Carry out simple laboratory operations with an awareness of the importance of chemical safety.

Learning, Teaching and Assessment Strategy

Students will learn in small interactive groups (max 18 students) on learner-centred tasks and with a highly interactive approach to learning and teaching. There will be both classroom-based lessons and sessions in a science laboratory to focus on the practical aspect of the module. During the module, formative assignments will be set to provide students with detailed and helpful feedback. The students will be encouraged throughout to reflect on their own performance and the feedback they receive informs sessions with their personal tutor. The personal tutor monitors student performance and supports suggestions for improvement. The personal tutor can draw the senior team's attention to a struggling student through the 'at risk' process.

The summative assessment consists of two parts. Part 1 requires the students to carry out two laboratory operations and write reports that demonstrate the basic principles of chemical energy and describe the principles of redox reactions. The report should also evidence how the student has an awareness of the importance of rules governing safety in the laboratory. Part 2 of the summative assessment requires the student to participate in an unseen examination which covers the theoretical aspects of the module.

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Coursework - Written	Lab reports on 2 practical sessions (1000 words)	30%
Summative	Examination - Closed Book	Unseen Examination consisting of short answer questions (2 Hrs)	70%

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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