UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Inorganic Chemistry 1
Module Code	CFS4022-B
Academic Year	2024/5
Credits	20
School	School of Chemistry and Biosciences
FHEQ Level	FHEQ Level 4

Contact Hours	
Type	Hours
Practical Classes or Workshops	7
Lectures	22
Online Lecture (Asynchronous)	22
Tutorials	6
Directed Study	143

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

Module Aims

To introduce the students to the language and terminology of inorganic chemistry, while building an understanding of the underlying principles that govern chemical and physical properties of atoms and simple molecules. The concepts of bond formation and chemical properties will be discussed, with an introduction to vibrational spectroscopy.

The course will address the periodicity of the main group elements, transitional metals, lanthanides and actinides and cover the reactivity of s- and p-bloack elements. This course will also introduce solid state chemistry, group theory and the principles of X-ray diffraction. Additional transferable skills will be developed by groupwork and the students will improve their presentation skills with additional support provided by the careers centre.

Outline Syllabus
i) Atomic structure and properties, including the Bohr model and Particle-Wave Duality. ii) Predicting the shapes of polyatomic molecules using VSEPR theory and idnetification of symmetry elements, operations. iii) Utilisation of Lewis and valence bond theory to describe bonding in main group compounds. iv) Molecular Orbital Theory of diatomic and polyatomic molecules. v) Determining the periodic trends of the s, p, d and f-block elements to enable prediction of chemical reactivity and physicochemical properties. vi) Explaination of main group (s- and p-block) reactivity including Lewis acid-base theory and diagonal trends. vii) Using experimental and theoretical data to determine the solid state properties of compounds and address their synthesis and application, including details of their conductivity and principles of X-ray diffraction. viii) Methods of elemental analysis including combustion [CHN(S)] analysis, Atomic Absorption Spectroscopy, Xray Photoelectron/Fluorescence Spectroscopy. ix) Teamwork to write and present a seminar style presentation.

Learning Outcomes	
Outcome Number	Description
01	Describe the basic principles of atomic structure and identify quantum numbers
02	Appraise and compare different models of bonding for homonuclear and heteronuclear diatomic molecules.
03	Explain the different models used to predict the shapes and stability of polyatomic molecules.
04	Describe the general chemistry of the s, p, d & f-block elements, and identify trends in their chemical and physical properties.
05	Rationalise the chemical reactivity of main block (s and p) compounds.
06	Explain the principles of solid state chemistry, discuss their applications, bonding and the basic details of X-ray diffraction.
07	Define the symmetry elements and operations of molecules and discuss their importance in vibrational spectroscopy.
08	Work as a team to discuss and prepare a scientific presentation.

Learning, Teaching and Assessment Strategy

The module uses a blended approach to support learning and achievement. Students will engage with a series of weekly online learning packages. These will include short videos that address key concepts, a set of structured activities (reading, online discussions etc.) that 'scaffold' the learning, and a range of formative tasks that generate feedback on progress.

Students will also engage in a series of on-campus tutorials. Online sessions (tutorials/discussions) will also be used to support learning and monitor progress as student move through the curriculum. In semester 1 students will be assigned to different groups to prepare and present a seminar to the cohort. Support for group working will be provided by the careers service.

Students will be guided throughout the module with directed study to acquire knowledge and understanding of the underlying concepts laid out in the syllabus. The virtual learning environment (VLE) will be used to disseminate lecture notes, module handbooks, links to online resources, and any announcements regarding the module to the students.

Assessment 1: A group presentation (LO 8).
Assessment 2: Take home problem solving assessment for whole module
Assessment 3: An online closed book examination of 90 minutes at the end of the module (LOs 1-7).

Mode of Assessment

Type	Method	Description	Weighting
Summative	Presentation	Group presentation (10 + 15 minutes)	25%
Summative	Coursework - Written	Take home problem solving assessment (1000 words)	25%
Summative	Computerised examination	Closed book computerised assessment (90 minutes)	50%

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.
