APPROVED

CHEM6002: Chemical Principles

Module Details

Module Code:	CHEM6002
Title:	Chemical Principles APPROVED
Long Title:	Chemical Principles
NFQ Level:	Fundamental
Valid From:	Semester 1 - 2019/20 (September 2019)
Duration:	1 Semester
Credits:	5
Field of Study:	4421 - Chemistry
Module Delivered in:	11 programme(s)
Module Description:	This module introduces students to the fundamentals of atomic theory, chemical bonding, the periodic table, physical states of matter, and stoichiometric calculations

Learning Outcomes

On successful completion of this module the learner will be able to:

#	Learning Outcome Description
LO1	Describe fundamental principles of atomic theory and chemical bonding
LO2	Outline the main features and trends in the periodic table of elements
LO3	Apply fundamental chemical concepts to writing chemical equations and naming inorganic compounds
LO4	Perform basic stoichiometric calculations
LO5	Use a range of chemical equipment and techniques to perform basic laboratory procedures

Dependencies

Module Recommendations

13215	CHEM6002	Chemical Principles

Incompatible Modules

No incompatible modules listed

Co-requisite Modules

No Co-requisite modules listed

Requirements

No requirements listed

Indicative Content

Atomic Structure
Sub-atomic particles, electonic structure of atoms, isotopes, radioactivity

Periodic Table
Structure of the periodic table, classification of the elements, trends in the properties of the elements

Chemical Bonding
Introduction to valence bond theory; ionic and covalent bonds, hybridisation, molecular geometry, valence shell electron pair repulsion theory (VSEPR); overview of metallic bonds and bonding in semi-conductors; relevant examples

States of Matter
Intermolecular forces; physical properties of gases, liquids and solids

Chemcial Nomenclature
Aims, history and types of chemical nomeclature. Organic and Inorganic nomenclature.

Stoichiometry
Balanced equations, the mole, solutions, concentration calculations

Practical programme
General chemistry laboratory procedures, gravimetric and volumetric analysis

Module Content & Assessment

Assessment Breakdown	%
Coursework	100.00%

Assessments

Coursework

Assessment Type	Multiple Choice Questions	**% of Total Mark**	20
Timing	Week 7	**Learning Outcomes**	1,2,4

Assessment Description
Theory assessment. Typical content examined: atomic structure, periodic table, chemical bonding states of matter, stoichiometry

Assessment Type	Short Answer Questions	**% of Total Mark**	30
Timing	Week 12	**Learning Outcomes**	1,2,3,4

Assessment Description
Theory assessment. Typical content examined: atomic structure, periodic table, chemical bonding, states of matter, chemical nomenclature, stoichiometry

Assessment Type	Practical/Skills Evaluation	**% of Total Mark**	40
Timing	Every Week	**Learning Outcomes**	4,5

Assessment Description
Performance of practicals and submission of reports and calculations

Assessment Type	Practical/Skills Evaluation	**% of Total Mark**	10
Timing	Week 13	**Learning Outcomes**	4,5

Assessment Description
Lab Exam to include independent performance of an experiment carried out in the practical programme and completion of associated calculations

No End of Module Formal Examination

Reassessment Requirement
Repeat examination *Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.*

Module Workload

Workload: Full Time					
Workload Type	*Contact Type*	*Workload Description*	*Frequency*	*Average Weekly Learner Workload*	*Hours*
Lecture	Contact	Delivery of content and material underpinning learning outcomes	Every Week	3.00	3
Lab	Contact	Practical skills development	Every Week	2.00	2
Independent & Directed Learning (Non-contact)	Non Contact	Review of course material, completion of laboratory reports and exam practice	Every Week	2.00	2
Independent & Directed Learning (Non-contact)	Non Contact	Review of course material, completion of laboratory reports and exam practice	Every Week	2.00	2
				Total Hours	9.00
				Total Weekly Learner Workload	9.00
				Total Weekly Contact Hours	5.00

Workload: Part Time					
Workload Type	*Contact Type*	*Workload Description*	*Frequency*	*Average Weekly Learner Workload*	*Hours*
Lecture	Contact	Delivery of content and materials underpinning learning outcomes	Every Week	3.00	3
Lab	Contact	Practical skills development	Every Week	2.00	2
Independent & Directed Learning (Non-contact)	Non Contact	Review of course material, completion of laboratory reports and exam practice	Every Week	2.00	2
				Total Hours	7.00
				Total Weekly Learner Workload	7.00
				Total Weekly Contact Hours	5.00

Module Resources

Recommended Book Resources

Brown, LeMay, Bursten, Murphy, Woodward, Stoltzfus. (2017), Chemistry: The Central Science in SI Units, 14th.. Pearson, [ISBN: 9781292221229].

Supplementary Book Resources

McMurray, Fay, Robinson. (2015), Chemistry, 7th. Pearson, [ISBN: 9781292092751].

This module does not have any article/paper resources

Other Resources

Website, Khan Academy. (2017), Khan Academy Chemistry, https://www.khanacademy.org/science/chem istry

Website, Chemistry LibreTexts. (2016), Chemistry LibreTexts, https://chem.libretexts.org/

Module Delivered in

Programme Code	Programme	Semester	Delivery
CR_SCHQA_8	Bachelor of Science (Honours) in Analytical Chemistry with Quality Assurance	-1	Mandatory
CR_SESST_8	Bachelor of Science (Honours) in Environmental Science and Sustainable Technology	-1	Mandatory
CR_SINEN_8	Bachelor of Science (Honours) in Instrument Engineering	-1	Mandatory
CR_SCHEM_7	Bachelor of Science in Analytical and Pharmaceutical Chemistry	-1	Mandatory
CR_SPHYS_7	Bachelor of Science in Applied Physics and Instrumentation	-1	Mandatory
CR_ESBMO_6	Certificate in the Science of Biotechnological Manufacturing Operations	-1	Mandatory
CR_SPHYS_6	Higher Certificate in Science in Applied Physics and Instrumentation	-1	Mandatory
CR_SCHEM_6	Higher Certificate in Science in Chemistry	-1	Mandatory
CR_SGMPR_6	Higher Certificate in Science in Good Manufacturing Practice and Technology	-1	Mandatory
CR_SOMNI_8	Physical Sciences (Common Entry)	-1	Mandatory
CR_SOMNI_7	Physical Sciences (Common Entry)	-1	Mandatory