ZCHE C1102: Chemistry 2

Module Title:	Chemistry 2
Language of Instruction:	English

Credits:	10

NFQ Level:	6

Module Delivered In	6 programme(s)

Teaching & Learning Strategies:	This module will be taught in four theory classes of 1 hour duration plus one 3 hour practical per week. To consolidate lectures and practicals, students will be required to carry out assignments and prepare a weekly practical report analysing their own research and results. Any course –related issue of questions that may arise will be discussed at lectures.

Module Aim:	To provide students with a knowledge of basic theoretical and practical chemistry principles.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Describe basic chemical terminology, facts, and principles.
LO2	Perform practical laboratory skills in chemical and analytical procedures.
LO3	Compute thermochemical, electrochemical, and other relevant calculations.
LO4	Draw, identify, classify, and discuss a wide variety of organic molecules
LO5	Recognise a number of chemical reactions of common organic functional groups and predict simple reaction products.
LO6	Discuss the importance of chemistry in everyday life.

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*
No recommendations listed
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*
No requirements listed

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Module Content & Assessment

Indicative Content
Gases Kinetic Theory of Gases. Gas laws. Ideal gas equation and applications.
Thermochemistry First law of thermodynamics. Hess's Law. Enthalpies of formation/combustion/solution/neutralisation.Foods, fuels and explosives.
Kinetics Reaction rates. Temperature and rate collision theory. Catalysis.
Oxidation & reduction Oxidation - reduction reactions. Balancing oxidation - reduction equations. Redox titrations.
Electrochemistry Electrochemical series. Electrolysis of molten NaCl. Faraday's Laws, voltaic cells, cell EMF. Fuel cells. Corrosion and prevention.
Periodic Table The chemistry of a number of groups.
Organic chemistry (1) Chemistry of carbon compounds. Hydrocarbons and their origins in petroleum fractions. Alkanes, alkenes, alkynes. Nomenclature. Bonding. Hybridisation.
Organic chemistry (2) Functional groups. Alcohols, aldehyes, ketones, esters, amines, and amides. Introduction to benzene chemistry. Resonance structures. Monosubstituted benzenes. Disubstituted benzenes: ortho, meta, and para.
Organic chemistry (3) Nucleophiles and electrophiles. Curved arrows. Simple reactions of the alkanes, alkenes, alkynes. Simple reactions and interconversion of functional groups.
Modern materials/industrial chemistry Liquid crystals, polymers, ceramics and thin films. Use of thin films. Diamond coatings. Semi-conductors. Industrial scale productions - ammonia, nitric acid, sulphuric acid and alumina.
Chemistry and the environment Chemistry of the troposphere. Air, water and land pollution. Hardness of water. Water softening. Catalytic converters.
Nanochemistry Introduction to nanoscience. A basic chemical strategy for making nanomaterials.
Practicals Titrimetric analysis using oxidation/ reduction examples. Thermochemical analysis. Kinetic investigation. Electrochemical Determination. Synthesis, purification and recrystallisation of an organic compound. Qualitative organic analysis.

Assessment Breakdown	%
Continuous Assessment	20.00%
Practical	50.00%
End of Module Formal Examination	30.00%

Special Regulation
Students must achieve a minimum grade (35%) in both the practical/CA and final examination

Continuous Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	Throughout Year	1,3,4,5	20.00	n/a

No Project

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Practical Log Book	2	50.00	Every Week

End of Module Formal Examination

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	3 hour exam	1,3,4,5,6	30.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	12 Weeks per Stage	4.00
Practicals	12 Weeks per Stage	3.00
Independent Learning	15 Weeks per Stage	11.07
	Total Hours	250.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_SABTP_B	Bachelor of Science (Honours) in Biosciences with Biopharmaceuticals	2	Mandatory
CW_SABRE_B	Bachelor of Science (Honours) in Brewing and Distilling	2	Mandatory
CW_SAPHA_B	Bachelor of Science (Honours) in Pharmaceutics and Drug Formulation	2	Mandatory
CW_SAASC_D	Bachelor of Science in Analytical Science	2	Mandatory
CW_SABFQ_D	Bachelor of Science in Biosciences	2	Mandatory
CW_SASCI_C	Higher Certificate in Science in Applied Biology or Applied Chemistry	2	Mandatory