ZCHE C1101: Chemistry 1

Module Title:	Chemistry 1
Language of Instruction:	English

Credits:	5

NFQ Level:	6

Module Delivered In	6 programme(s)

Teaching & Learning Strategies:	This module will be taught in two 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	Compute stoichiometric, titrimetric, and other relevant calculations.
LO3	Perform practical laboratory skills in chemical and analytical procedures

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
Atomic Theory History & modern view of atomic structure. Electronic configuration, Pauli's exclusion principle, the Aufbau principle, and Hund's rule. Isotopes. Atomic Mass.
Periodic Table Periodic table. How to read the table. Periodicity and trends, to include atomic radii, ionization energy, electron affinity, and electronegativity.
Bonding and Intermolecular Interactions Molecules/Ions/Metallic solids. Chemical bonds. Polarity. Van Der Waals Forces (London dispersion, dipole-dipole). Hydrogen bonding. States of matter - characteristics of solids, liquids, gases. Density.
Stoichiometry Calculations with chemical formulae and equations: Formulae. Elemental analysis. Molecular mass. The mole. Chemical equations and stoichiometry.
Volumetric Analysis Solutions. Concentrations: Molarity, ppm, percent solutions. Dilutions. Titrations: Apparatus, safety procedures, and technique. Titrimetric calculations.
Chemical Equilibrium Dynamic equilibrium. Le Chatelier's principle to demonstrate effects on equilibrium. Applications in control of industrial processes. Haber process.
Acid base equilibria Acids and bases - Bronsted-Lowry acids and bases. pH scale. Strong and weak acids. Buffer solutions.
Practicals Use of volumetric glassware. Titrimetric analysis including direct, indirect, and back titrations using various acid-base examples. pH determination and equilibria reactions. Qualitative inorganic 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	1,2	20.00	n/a

No Project

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Practical Log Book	3	50.00	Every Week

End of Module Formal Examination

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	3 hour exam	1,2	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	2.00
Practicals	12 Weeks per Stage	3.00
Independent Learning	15 Weeks per Stage	4.33
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_SABTP_B	Bachelor of Science (Honours) in Biosciences with Biopharmaceuticals	1	Mandatory
CW_SABRE_B	Bachelor of Science (Honours) in Brewing and Distilling	1	Mandatory
CW_SAPHA_B	Bachelor of Science (Honours) in Pharmaceutics and Drug Formulation	1	Mandatory
CW_SAASC_D	Bachelor of Science in Analytical Science	1	Mandatory
CW_SABFQ_D	Bachelor of Science in Biosciences	1	Mandatory
CW_SASCI_C	Higher Certificate in Science in Applied Biology or Applied Chemistry	1	Mandatory