ZCHE C3103: Physical Chemistry

Module Title:	Physical Chemistry
Language of Instruction:	English

Credits:	5

NFQ Level:	7

Module Delivered In	2 programme(s)

Teaching & Learning Strategies:	To understand the importance of quantification and measurement in physicochemical process. To develop working models or rigs for efficient analyte extraction. To understand the importance of the use of instrumentation in industrial process.

Module Aim:	To provide a basic knowledge of the measurement technques which underline chemical analysis and process. To use elcetrochemical and surface chemical methods to synthesize, extract and to electrodeposit. To investigate the mechnaisms of chemical reaction.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Explore the use of common laboratory instrumentation in controlling physicochemical process.
LO2	Develop methods for the efficient production and monitoring of electrolyte in electrochemical process.
LO3	Describe the importance of efficiency and yield in processes.

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
Websites and e-books will be used as much as formal printed material n/a
Thermodynamics Second, third laws of thermodynamics. Reversible and irreversible systems. Heats of reaction, entropy. Electrical potential
Surface & Colloid Chemistry The dispersed state. Surface tension. Surfactants and emulsions. Viscosity and rheology. Adsorption. Catalysis.
Electrochemistry, Electrolytes Fuel cells and emf. Debye-Huckel equation. Transport properties of electrolytes. Oxidation and reduction. Electrochemical deposition. Non-aqueous solvents and ionic liquids.
Kinetics 1st-, 2nd and 3rd – order processes. Law of mass action. Arrhenius equation. Yields in chemical process. Solubility product.
Phase behaviour Phase rule. Henry's Law. Binary and ternary phase diagrams. Melting and eutectic point determination. Melting behaviour of polymers. Alloy formation

Assessment Breakdown	%
Continuous Assessment	10.00%
Practical	30.00%
End of Module Formal Examination	60.00%

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

Continuous Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	Thermodynamics. Heats of reaction, entropy. Surface & Colloid Chemistry Viscosity and rheology. Electrochemistry, Kinetics Phase behaviour	1,2,3	10.00	n/a

No Project

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Viscosity of fluids and gels. Kinetic pathways of common reactions. Electrochemical processes. Surface chemical methods and emulsions. Solutions and conductivity. Optical properties.	1,2,3	30.00	n/a

End of Module Formal Examination

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	Thermodynamics. Heats of reaction, entropy. Surface & Colloid Chemistry Viscosity and rheology. Electrochemistry, Kinetics Phase behaviour	1,2,3	60.00	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
Laboratory	12 Weeks per Stage	3.00
Independent Learning Time	15 Weeks per Stage	4.33
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_SAPHA_B	Bachelor of Science (Honours) in Pharmaceutics and Drug Formulation	5	Mandatory
CW_SAASC_D	Bachelor of Science in Analytical Science	5	Mandatory