

Module Title:	Organic and Physical Chemistry 2	
Language of Instruction:	English	
Credits:	10	
NFQ Level:	6	
Module Delivered In	3 programme(s)	
Teaching & Learning Strategies:	This module will be taught in three one hour theory classes and one three hour practical session per week. To consolidate lectures and practicals, students will normally be required to carry out assignments and prepare a weekly practical report analyzing their own research and results. Any course-related issue or questions that may arise will be discussed at lectures.	
Module Aim:	The aim of this module is to impart knowledge of fundamental organic and physical chemistry and to provide practical training in this subject area with due regard to best practice and safety.	
Learning Outcomes		
On successful completion of this module the learner should be able to:		
LO1	Draw the structures and shapes of the main types of organic chemicals	
LO2	Draw the reaction mechanisms of some of the main reactions in organic and synthetic organic chemistry.	
LO3	List, describe and explain the tests used to identify unknown organic chemicals.	
LO4	Discuss and explain the physical chemistry of gases and liquids and carry out relevant calculations.	
LO5	State and explain the basic laws of thermodynamics and carry out relevant calculations.	
LO6	Perform and interpret designated laboratory exercises with due regard to safety and best practice.	
Pre-requisite learning		
Module Recommendations <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>		
4504	SCIE H1111	Chemistry
Incompatible Modules <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>		
No incompatible modules listed		
Co-requisite Modules		
No Co-requisite modules listed		
Requirements <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>		
No requirements listed		

Module Content & Assessment

Indicative Content

Aromatic hydrocarbons

Aromatic hydrocarbons. Orbital picture, resonance stabilisation energy of benzene and analogues. Reactions, electrophilic aromatic substitution, reactivity and orientation. Toxicity of aromatics

Organic oxygen containing compounds

Alcohols, Aldehydes, Ketones, Carboxylic acids, Esters, Ethers, Acid derivatives. Main reaction mechanisms. Organometallic compounds, Grignard reaction

Organic nitrogen containing compounds

Amines, amides. Mechanism of diazotisation.

Fats, oils, waxes, detergents

Fats, oils, waxes, detergents. Reactions and analysis.

Gases

The gas laws, kinetic theory of ideal gases. Real gases and Van der Waals equation. Liquefaction and solidification of gases, critical pressures, temperatures and volumes, supercritical fluids.

Fundamentals of thermodynamics

Thermodynamics laws, entropy, enthalpy, free energy, equilibrium and spontaneity.

Practicals

One "dry" practical covering relevant calculation. Subsequent practicals will develop the following synthetic skills - distillation, reflux, recrystallisation, soxhlet extraction, multi-step product synthesis, yield calculation, product purity determination, determination of the heats of formation, solvent extraction and specialised synthesis reactions.

Assessment Breakdown	%
Continuous Assessment	10.00%
Practical	40.00%
End of Module Formal Examination	50.00%

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	1 hour exam	1,2,3,4,5	5.00	n/a
Examination	1 hour exam	1,2,3,4,5	5.00	n/a

No Project

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Practical Laboratory report book	6	40.00	End-of-Semester

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	3 hour exam	1,2,3,4,5	50.00	End-of-Semester

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

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	12 Weeks per Stage	3.00
Practicals	12 Weeks per Stage	3.00
Independent Learning	15 Weeks per Stage	11.87
Total Hours		250.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_SAPHA_B	Bachelor of Science (Honours) in Pharmaceutics and Drug Formulation	4	Mandatory
CW_SAASC_D	Bachelor of Science in Analytical Science	4	Mandatory
CW_SASCI_C	Higher Certificate in Science in Applied Biology or Applied Chemistry	4	Group Elective 2