

Module Title:	Applied Physics and Chemistry
Language of Instruction:	English
Credits:	10
NFQ Level:	6
Module Delivered In	4 programme(s)
Teaching & Learning Strategies:	Formal lectures will be supplemented by laboratory work as individuals and where appropriate, in groups. The lecturer will balance the learning experience to ensure that the learner obtains knowledge through doing as well as through formal lecturers. This will allow them to understand the chemical and physical process that underpin sustainable agricultural production. Case studies will be presented to demonstrate important the role of chemistry and physics in food production. Practical learning experiences will delivered through the use of field labs to demonstrate soil and water chemistry as well as various laboratory sessions to demonstrate chemical processes as well as various laws of physics. An emphasis will be placed on health and safety in biological studies throughout.
Module Aim:	The aim of this module is to provide the learner with an introduction to the principles of physics and chemistry and their importance and relevance to sustainable agriculture. The module will develop practical laboratory skills in both disciplines.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Be capable of understanding the physical and chemical processes that affect nutrient cycling within an agricultural system
LO2	Demonstrate an understanding of the chemistry of food and the implications of this for those consuming it
LO3	Be capable of conducting work in a laboratory setting that is both precise and safe
LO4	Have an appreciation of the role of physics as it applies to agri-food scenarios
Pre-requisite learning	
Module Recommendations <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>	
No recommendations listed	
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

Chemistry

• Introduction: The scope of chemistry & brief history of its development. States of matter and observation of change. • The Periodic Table. • Atomic Theory & Electronic Structure • Bonding & Structure: Chemical Equations and Experimental Calculations • Chemical Kinetics - value. Order of reaction and rate constants. • Properties of Liquids and Solutions: • Acids, Bases and Electrolysis. • Inorganic Chemistry • Organic Chemistry: Introduction to chemistry of carbon compounds. IUPAC Nomenclature for alkanes, alkenes, alcohols, aldehydes, carboxylic acids, esters and amines. Brief introduction to the structures of proteins, fats and carbohydrates and their uses.

Physics

• Physical standards and units. Errors. • Mechanics: Velocity, acceleration, force. • Work, energy and power, momentum. Simple machines • Light, lenses • Electricity, Ohm's law, electrical safety. • Thermodynamics Methods of heat transfer. Specific Heat capacity, U values Material Properties Pressure • Atomic and Nuclear physics: radioisotopes, biological effects of radiation, safety levels, x-rays.

Assessment Breakdown

	%
Practical	50.00%
End of Module Formal Examination	50.00%

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
Laboratory	12 Weeks per Stage	2.00
Tutorial	12 Weeks per Stage	1.00
Independent Learning	12 Weeks per Stage	6.00
Total Hours		144.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_SWOAG_B	Bachelor of Science (Honours) in Organic Agriculture	1	Mandatory
CW_SWSFM_B	Bachelor of Science (Honours) in Sustainable Farm Management and Agribusiness	1	Mandatory
CW_SWOAG_D	Bachelor of Science in Organic Agriculture	1	Mandatory
CW_SWSFM_D	Bachelor of Science in Sustainable Farm Management and Agribusiness	1	Mandatory