

Module Title:	Fundamental Biology
Language of Instruction:	English
Credits:	10
NFQ Level:	6
Module Delivered In	6 programme(s)
Teaching & Learning Strategies:	This module will be taught in five theory classes of one hour duration and one two hour practical per week. Practical sessions and theory will be synchronised. Synopsised lecture notes will be available for downloading by the students. Instructions for practicals will be provided in the form of photocopied excerpts from the in-house practical manual. Students will be regularly expected to reply to questions during both theory and practical sessions. Questions relating to the course will be discussed during or after lectures/practicals. Students will be referred to specialised texts available in the library and to scientific Internet resources where applicable. The practical component will: Allow the students to develop technical competency and Health and Safety protocols. Train the student in punctual submission of reports and in accurate report writing. Encourage team work and cooperative problem solving.
Module Aim:	To provide a comprehensive overview of the life sciences and to provide practical skills essential for further studies.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Students will be able to define what life is, identify its characteristics and chemical composition and explain our current understanding on the origins of Life and the basis of evolution by natural selection.
LO2	Students will be able to describe the fundamental biochemical, physiological and hereditary processes in living cells.
LO3	Students will be able to discuss the anatomy of plants and microbes, the major divisions within their Kingdoms and their evolutionary affinities.
LO4	Students will be competent in a wide variety of laboratory techniques in cell biology, botany and microbiology
LO5	Students will be able to clearly communicate underlying scientific principles/theory and their results from their completed experiments
LO6	Students will demonstrate enquiry based learning by selecting a science related topic of interest and submitting a 2 page essay on that topic
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

LO 1: The nature of life

The origin and nature of the universe, living and non living matter, characteristics of living things, cell theory. The origin of life (Abiogenesis v panspermia) and evolutionary theory (natural selection), Taxonomy and classification of lifeforms.

LO 2: Cells

Cell ultrastructure and function, the cell cycle, the cell division, enzymes and metabolism. Genes and protein production, chromosomes and the basis of heredity, principles of genetics.

LO 3: Diversity of life

Review of the main Kingdoms of Life (Eubacteria, Archea, Protists, Plant and Fungi), Characteristics and main groups in each Kingdom.

LO 4/LO 5: Practical Skills

Care and use of the microscope. Examination of plant and animal cells. Algae, bryophyta and pteridophyta. Angiosperm tissues: sectioning and staining of dicotyledonous and monocotyledonous stem, root and leaf. Floral structure, identification of plants. Seeds and fruits. Examination of preserved and living specimens of protozoa, platyhelminthes, nematoda, annelida and arthropoda. Dissection of *Gromphadorhina portentosa*. Examination of a set of prepared histological slides. Dissection of *Rattus rattus* and the sheep heart. The human skeleton. The chromosome stain. Safety rules in the microbiology laboratory; principles of aseptic technique. Preparation of nutrient agar plates; demonstration of the ubiquity of bacteria. Cultivation of a pure culture using selective media, subculturing. The simple stains, the hanging drop preparation. Examination of *Rhizopus*, *Penicillium*, *Saccharomyces*, *Agaricus campestris*.

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

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 mid semester exam Multiple choice exam.	1,2	5.00	Week 6
Essay	Essay based on students own interest in a biological science related topic	6	5.00	Week 8

No Project

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Students will be assessed on the quality of their written reports. These should demonstrate their ability to explain, in their own words, the theory/principle behind the practical, materials and methods used, clear and detailed observations and their interpretation of their observations. Practical skill will be assessed at the end of each term via practical examinations. Students will also be required to complete one oral presentation describing a practical of their choice (theory, methods used, their results and their interpretation and conclusions).	1,2,3,4,5	50.00	n/a

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	Students must achieve a minimum grade of 35% in their final exam and must obtain a minimum grade of 40% when CA/Practical and Final Exam grades are combined.	1,2,3,4	40.00	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	5.00
Laboratory	12 Weeks per Stage	2.00
Estimated Learner Hours	15 Weeks per Stage	11.07
Total Hours		250.00

Module Delivered In

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