

<b>Module Title:</b>	Fundamental Biology
<b>Language of Instruction:</b>	English
<b>Credits:</b>	15
<b>NFQ Level:</b>	6
<b>Module Delivered In</b>	<a href="#">1 programme(s)</a>
<b>Teaching &amp; Learning Strategies:</b>	<p>This module will be taught in four theory classes of one hour duration and one two hour practical. 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.</p>

<b>Module Aim:</b>	To provide a comprehensive overview of the life sciences and to provide practical skills essential for further studies.
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Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Define what life is, its characteristics and chemical composition.
LO2	Explain our current understanding on the origins of Life and the basis of evolution by natural selection.
LO3	Describe the fundamental biochemical, physiological and hereditary processes in living cells.
LO4	Describe the anatomy of plants, animals and microbes, the major divisions within their Kingdoms and their evolutionary affinities.
LO5	Demonstrate a wide variety of laboratory techniques in botany, zoology and microbiology
LO6	Demonstrate ability to clearly communicate underlying scientific principles/theory and their results from their completed experiments
LO7	Demonstrate enquiry based learning by selecting a science related topic of interest and submitting a 2 page essay on that topic

Pre-requisite learning
<b>Module Recommendations</b> <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>
No recommendations listed
<b>Incompatible Modules</b> <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>
No incompatible modules listed
<b>Co-requisite Modules</b>
No Co-requisite modules listed
<b>Requirements</b> <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.

#### LO 2: Theories on the origins of life and evolution

The origin of life (Abiogenesis v panspermia) and evolutionary theory (natural selection), Taxonomy and classification of lifeforms.

#### LO 3: Cells

Cell ultrastructure, cell division, enzymes and metabolism.

#### LO 3: Genetics

Genes and protein production, chromosomes and the basis of heredity, principles of genetics.

#### LO 4: Review of the Kingdom Protista

Ameoba, paramecium, euglenoids, diatoms, multicellular algae

#### LO 4: Botany

The plant Kingdom. Bryophytes/Pteridiophytes, Gymnosperms and Angiosperms. Angiosperm macro- and cellular anatomy, roots/stems and leaf. The flower, pollination and seed development

#### LO 4: Animal Biology

Review of major animal phyla, mammals, human evolution, digestion and nutrition, respiration, excretion, skeletal and muscular system, reproduction, senses

#### LO 4: Mycology

Morphology, nutrition and life cycles of representatives of the main phyla.

#### LO 4: Bacteriology

The prokaryotic cell; archaeobacteria and eubacteria; respiration, nutrition, reproduction, cultivation and enumeration techniques; asepsis, the nitrogen cycle.

#### LO 5/LO6: Practical

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	Four examinations, 1 midterm and 1 end of each semester Submission of enquiry based essay	3,4,6,7	10.00	n/a

No Project

### Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Student 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.	3,4,5,6	50.00	n/a

### End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	No Description	1,2,3,4,5	40.00	End-of-Semester

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

**Module Workload**

<b>Workload: Full Time</b>		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	30 Weeks per Stage	4.00
Laboratory	30 Weeks per Stage	2.00
Estimated Learner Hours	30 Weeks per Stage	2.00
Total Hours		240.00

**Module Delivered In**

Programme Code	Programme	Semester	Delivery
CW_SASES_B	<a href="#">Bachelor of Science (Honours) in Environmental Science</a>	1	Mandatory