

Module Title:	Agricultural Microbiology
Language of Instruction:	English
Credits:	5
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 complex role that fungi, bacteria and protozoa play in agri-food systems. Case studies on the significance of antimicrobial resistance will be presented to the students. Practical learning experiences will focus on factors that affect microbial growth using fungi and bacteria as model microbes. An emphasis will be placed on health and safety in biological studies throughout.
Module Aim:	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 complex role that algae, bacteria, fungi and protozoa play in agri-food systems. Case studies on the significance of antimicrobial resistance will be presented to the students. Practical learning experiences will focus on factors that affect microbial growth using fungi and bacteria as model microbes. An emphasis will be placed on health and safety in biological studies throughout.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Understand the differences between algae, bacteria, fungi and protozoa at a cellular level
LO2	Demonstrate how the risk of antimicrobial resistance developing in the food chain can be reduced
LO3	Demonstrate how the microbe contributes to ecosystem services
LO4	Understand the optimal conditions that are required for microbial growth
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

Plant Biology

• Introduction to plant taxonomy; identification of agriculturally important crop and weed species. • Plant cells; structure & function • Physiology of flowering plants: photosynthesis; respiration; reproduction; growth; nutrition; response to environmental stimuli. • Algae; liverworts; mosses; ferns; horsetails; club mosses; and conifers. • Introduction to Agricultural microbiology; agriculturally-important fungi, bacteria and viruses.

Mycology

Cell structure of the fungus, acquisition of nutrients from the environment, factors that affect fungal growth, ecosystem services of fungi, practical uses fungi, fungi as pests of plants and animals

Animal Biology

• Introduction to animal taxonomy • Animal cells; structure and function • Animal physiology; respiration; reproduction; endocrine system; digestion; growth; nutrition; movement. • Introduction to Agricultural entomology; identification of insects, arthropods and other forms of agricultural significance.

Bacteriology

Cell structure of bacteria, acquisition of nutrients from the environment, factors that affect bacterial growth, the role of bacteria in the digestive process of animals, bacteria in food production, antimicrobial resistance in bacterial populations

Protozoa

Cell structure of the protozoa, differences amongst protozoa in their acquisition of energy and other nutrients necessary for growth and development, ecosystem services of protozoa.

Algal biology

Cell structure of algae, acquisition of nutrients from the environment, factors that affect algal growth, algae in the fresh water environment, marine algae, practical uses of algae in agri-food production

Assessment Breakdown	%
Practical	50.00%
End of Module Formal Examination	50.00%

No Continuous Assessment

No Project

Practical				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Students will be expected to produce a two page summary of their lab session summarising the importance of the topic covered, the methodology and outcomes. Sketches of the outcomes will be encouraged where appropriate. The report should be typed with sketches included as figures. It will be handed in a timely manner and general feedback will be given in subsequent lab sessions.	1,2,3,4	50.00	Every Week

End of Module Formal Examination				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	Terminal Examination		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	1.50
Laboratory	12 Weeks per Stage	1.50
Independent Learning	12 Weeks per Stage	3.00
Total Hours		72.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_SWOAG_B	Bachelor of Science (Honours) in Organic Agriculture	3	Mandatory
CW_SWSFM_B	Bachelor of Science (Honours) in Sustainable Farm Management and Agribusiness	3	Mandatory
CW_SWOAG_D	Bachelor of Science in Organic Agriculture	3	Mandatory
CW_SWSFM_D	Bachelor of Science in Sustainable Farm Management and Agribusiness	3	Mandatory