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| 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 |