

Module Title:	Fundamentals of Microbiology 1
Language of Instruction:	English
Credits:	5
NFQ Level:	8
Module Delivered In	6 programme(s)
Teaching & Learning Strategies:	<p>This module contains the key concepts of fundamental microbiology at level 6. Learning objectives , learning activities and assessments are constructively aligned . The integration of the practical and theoretical aspects of the module will reinforce deep learning of key concepts , skills and competencies . A variety of active learning strategies will be employed to ensure that the learning objectives are met. Students are expected to engage actively with the material at lectures, in practicals and by independent learning VLE Blackboard Autonomous learning will be developed by use of scaffolded in class and independent research and enquiry activities . Research and enquiry skills will be developed in a supported manner via activities that will involve the learner finding , evaluating and organising information from credible sources, analysis and synthesis of new information and communicating new knowledge in the correct discipline appropriate convention. These learning activities will also encourage digital literacy, development of communication skills and group and peer learning. The practical component will support the theoretical aspects of the module and promote deep learning via, the formulation of simple hypotheses, structured investigation of simple problems and application of prior knowledge . In addition ,practicals will allow students to :develop the required safe technical competencies, attitudes and behaviours in Microbiology; the necessary analytical, mathematical and graphing skills; group skills; time management, report writing and presentation skills. Learning outcomes will be assessed by a variety of methods e.g. practical reports, multiple choice questions, assignments, video demonstrations , presentations . Continuous assessment will be accompanied by feedback delivered via Blackboard and face to face to drive learning. Group and peer learning will be facilitated during the preparation of assignments, presentations and practicals. Strategies for the assessment of the practical component that encourages not only the development of key practical and reporting competencies but also critical thinking, analysis and group learning will be used via digital and conventional means as appropriate.</p>
Module Aim:	To introduce learners to the key concepts of practical and theoretical Microbiology and to allow them to develop the required competencies, attitudes and behaviours.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Describe the diversity of the microbial world and describe microbial interactions with the environment and other organisms
LO2	Describe the nomenclature , classification, structure and organisation of key groups of microorganisms and explain the rationale of the methods used.
LO3	With due regard to cGMP and H and Safety demonstrate essential aseptic techniques in the cultivation , handling, staining , enumeration, storage of microorganisms and record and report results.
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

Diversity of Microbial World

Ubiquitous nature and metabolic diversity of Prokaryotic and eukaryotic microorganisms. Range of ecosystems where microorganism are found. Prokaryotes as the basis of all other life form. Biofilms in nature. Types of interactions between microbes and the environment. Principles of plant and animal interactions. Diversity and uniqueness of microbial metabolism, aerobic and anaerobic respiration, fermentation, oxygenic and anoxygenic photosynthesis. Heterotrophy and autotrophy.

Classification and Characterisation of Microorganisms

Nomenclature, taxonomy and classification of main groups of prokaryotic and eukaryotic microorganisms, Bacteria and Archaea. Continuing evolution of microorganisms. Phylogenetic and classical approaches of classification and identification. Structure and arrangement of prokaryotic and eukaryotic microorganisms. Consequences of the similarities and differences between prokaryotes and eukaryotes. Cellular compartments, envelope, cytoplasmic region, appendages: Spore formers. Viruses and their replication. Growth, metabolism and physiology.

Practical component.

Emphasis is on develop essential aseptic and microbial techniques in a safe and competent manner with due regard to cGood Microbiological Practice and Occupational Health and Safety. Fundamentals of Microbiology 2 will apply these skills Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast). Prepare and use pure culture and selective techniques to cultivate, handle, store microorganisms. Dispose of microbial waste correctly. Use appropriate methods to identify microorganisms (media-based, molecular and serological). Enumerate microorganisms in a sample (using, for example, direct count, viable plate count, and spectrophotometric methods and carry out appropriate mathematical, statistical and graphical manipulations Use appropriate microbiological and molecular lab equipment and methods. Practice safe microbiology, using appropriate protective and emergency procedures. Analyse and interpret and contextualise results. Document and report on experimental protocols, results and conclusions

Assessment Breakdown

	%
Continuous Assessment	60.00%
Practical	40.00%

Special Regulation

Learners must achieve a minimum of 35% in CA and Practical elements

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	Learning outcomes will be assessed by a blended approach of digital, VLE based and other methods e.g. practical reports, multiple choice questions, short questions, class room assessment techniques, guided assignments, video demonstrations, presentations. Both formative and summative continuous assessment will be accompanied by feedback delivered via Blackboard/Turnitin and face to face to drive learning. Group and peer learning will be facilitated during the preparation of assignments, presentations and practicals.	1,2	60.00	n/a

No Project

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Strategies for the assessment of the practical component that encourage not only the development of key practical and reporting competencies but also the appropriate scientific thinking, research and enquiry, reflection, analysis, group learning and communication skills will be used via digital and conventional means as appropriate.	3	40.00	n/a

No End of Module Formal Examination

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	2.00
Laboratory	12 Weeks per Stage	2.00
Estimated Learner Hours	15 Weeks per Stage	5.13
Total Hours		125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EEBEE_B	Bachelor of Engineering (Honours) in Biomedical Electronics	3	Mandatory
CW_EEBEE_D	Bachelor of Engineering in Biomedical Electronics	3	Mandatory
CW_SABTP_B	Bachelor of Science (Honours) in Biosciences with Biopharmaceuticals	3	Mandatory
CW_SABRE_B	Bachelor of Science (Honours) in Brewing and Distilling	3	Mandatory
CW_SABFQ_D	Bachelor of Science in Biosciences	3	Mandatory
CW_SASCI_C	Higher Certificate in Science in Applied Biology or Applied Chemistry	3	Group Elective 1