University of the West of Scotland

Module Descriptor

Session: 2023/24

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Title of Module: Food and Environmental Microbiology

Code: BIOL10025	**SCQF Level: 10** (Scottish Credit and Qualifications Framework)	**Credit Points: 20**	**ECTS: 10** (European Credit Transfer Scheme)
School:	School of Health and Life Sciences		
Module Co-ordinator:	Steven Kelly		

Summary of Module

In this module the student will be introduced through lectures, tutorials and problem based learning (PBL) to the underlying principles of microbiology in relation to Food and the Environment.

Students will explore the epidemiology of food borne disease, the problems associated with food spoilage and the novel preservation measures which can be taken to prevent spoilage. The module will deal with the significance of specific microbial genera in environmental niches and environmental technologies. This will include utilisation of microorganisms in processes such as bioremediation, wastewater treatment and “clean industries”. The exploitation of diverse microbial capabilities will be discussed with an emphasis on novel and developing environmental technologies such as metal bioaccumulation in the treatment of e-wastes.

Through the use of tutorials and PBL students will be introduced to such areas as the analysis of contaminated sites and the design and implementation of bioremediation protocols, the challenges facing the development of biofuels as a viable alternative to fossil fuels and the potential applications of genetically modified microorganisms across both food and environmental sectors.

This module will work to develop a number of the key “I am UWS” Graduate Attributes to make those who complete the module (e.g.) Universal Work Ready Successful. These will include students who complete the module being; Analytical, Inquiring, Digitally literate, Autonomous, Effective communicator, Collaborative, Research-minded and Driven.

Module Delivery Method

Face-To-Face	Blended	Fully Online	HybridC	HybridO	Work-based Learning
				✓	

Face-To-Face
Term used to describe the traditional classroom environment where the students and the lecturer meet synchronously in the same room for the whole provision.

Blended
A mode of delivery of a module or a programme that involves online and face-to-face delivery of learning, teaching and assessment activities, student support and feedback. A programme may be considered “blended” if it includes a combination of face-to-face, online and blended modules. If an online programme has any compulsory face-to-face and campus elements it must be described as blended with clearly articulated delivery information to manage student expectations

Fully Online
Instruction that is solely delivered by web-based or internet-based technologies. This term is used to describe the previously used terms distance learning and e learning.

HybridC
Online with mandatory face-to-face learning on Campus

HybridO
Online with optional face-to-face learning on Campus

Work-based Learning
Learning activities where the main location for the learning experience is in the workplace.

Campus(es) for Module Delivery						
The module will **normally** be offered on the following campuses / or by Distance/Online Learning: (Provided viable student numbers permit)						
Paisley:	Ayr:	Dumfries:	Lanarkshire:	London:	Distance/Online Learning:	Other:
			✓			

Term(s) for Module Delivery					
(Provided viable student numbers permit).					
Term 1	✓	Term 2		Term 3	

Learning Outcomes: (maximum of 5 statements)

On successful completion of this module the student will be able to:

L1. Have a clear understanding of the organisms associated with food and environmental samples.

L2. Understand the role of specific microbial metabolic processes in food and the environment and how such processes may be optimised and/or prevented.

L3. Demonstrate knowledge of emergent technologies in food and environmental microbiology

L4. Indicate the methods and requirements of the microbiological analysis of food and environmental samples.

L5. Understand the impacts of food and environmental microbiology (beneficial and detrimental) on society.

Employability Skills and Personal Development Planning (PDP) Skills	
SCQF Headings	During completion of this module, there will be an opportunity to achieve core skills in:
Knowledge and Understanding (K and U)	SCQF Level 10. Combining knowledge, theories and principles of food and environmental microbiology in novel ways in the analysis of complex and substantial problems and situations, objectively analysing these from a range of different viewpoints and theoretical standpoints to achieve successful outcomes.
Practice: Applied Knowledge and Understanding	SCQF Level 10. Having an extended ability to collect primary data and develop a growing awareness of the importance of the choice and application of suitable methods for this. The application of microbiological knowledge, including learned theory and principles, to novel situations, for example during food hygiene and food safety inspections or during development of environmental clean-up protocols, to identify and achieve a range of innovative and valid solutions to complex problems. The synthesis of theory and professional/vocational practice and standards, and critical evaluation of theory, process, solutions and outcomes.
Generic Cognitive skills	SCQF Level 10. The application of underpinning microbiological knowledge to critically analyse, evaluate and generate effective information, ideas and concepts related to food and environmental applications. The derivation of solutions to specific problems of food and environmental microbiology from general principles and standards,

	subsequently reflecting on the validity and appropriateness of these approaches and using the fruit of this reflection to modify future responses to these and related issues and the transfer of knowledge/solutions into new contexts.
Communication, ICT and Numeracy Skills	SCQF Level 10. Communicating clearly and concisely, orally and in writing, in an appropriate manner including, to non-practitioners without expertise in the area of food or environmental microbiology and in formal style in relation to major pieces of academic work. Using IT effectively to organise and present information in an accessible and understandable form. It is understood that candidates will have demonstrated an appropriate level of numeracy in order to pass previous academic modules in this Degree course.
Autonomy, Accountability and Working with others	SCQF Level 10. Working autonomously over significant and critical academic and practical tasks, accepting ownership and accountability for both the process and outcomes. Also, working and interacting, as part of a team, with individuals and groups from a variety of professional and vocational settings, developing the confidence and self-awareness to influence and, where appropriate lead, such groups. Identify new perspectives in and modifications to existing knowledge and practice, new areas for investigation and problems for solution. Developing the confidence required to carry out analyses such as food hygiene and food safety inspections or bioremediation feasibility studies in relation to the microbiological aspects against recognized standards and inform those inspected of the conclusions arrived at. Recognise the importance of Continuous Professional Development to extend knowledge and competence.

Pre-requisites:	Before undertaking this module the student should have undertaken the following:	
	Module Code: BIOL08004	**Module Title:** Introductory Microbiology
	Other:	
Co-requisites	**Module Code:**	**Module Title:**

* Indicates that module descriptor is not published.

Learning and Teaching

The module will be delivered using a blended approach with lectures, tutorials and collaborative workshops. Students will be required to access lecture content, links to reference sources and other support materials on the VLE. This will provide students with core material which forms the basis of the syllabus and extensive supplementary material to broaden their reading within the subject.

Lecture content will deliver fundamental information which will assist students in understanding key concepts relevant to contemporary food and environmental microbiology research.

Central to this module will be student-led discussions of current research papers on selected topics. These sessions may follow a range of formats from informal scientific discussions to structured presentations by the students. Case study assignments will allow students to demonstrate an ability to discuss and critically analyse current knowledge and research on a variety of food and environmental microbiology topics. Problem based learning approaches will also be used to allow students to evaluate and suggest microbiological solutions to specific challenges.

Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	**Student Learning Hours** (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture/Core Content Delivery	6
Tutorial/Synchronous Support Activity	30
Independent Study	164

	200 Hours Total

****Indicative Resources: (eg. Core text, journals, internet access)**

The following materials form essential underpinning for the module content and ultimately for the learning outcomes:

Applied and Environmental Microbiology (journal)

Evans, M. G. and Furlong, J. C (2003) Environmental Biotechnology. Theory and Application

Food Standards Agency web site: www.food.gov.uk

Maier R M, et al, (2008) Environmental Microbiology; 2nd Edition. Academic Press

Mortimore, S. and Wallace, C. (2013) HACCP A Practical Approach (3rd edition). Springer

Ray, B. and Bhunia A. (2014) Fundamental Food Microbiology (5th edition). CRC Press

Food and Environmental Microbiology VLE Site

(**N.B. Although reading lists should include current publications, students are advised (particularly for material marked with an asterisk*) to wait until the start of session for confirmation of the most up-to-date material)

Engagement Requirements

In line with the Academic Engagement Procedure, Students are defined as academically engaged if they are regularly engaged with timetabled teaching sessions, course-related learning resources including those in the Library and on the relevant learning platform, and complete assessments and submit these on time. Please refer to the Academic Engagement Procedure at the following link: Academic engagement procedure

Where a module has Professional, Statutory or Regulatory Body requirements these will be listed here: Attendance at synchronous sessions (lectures and tutorials), completion of asynchronous activities, and submission of assessments to meet the learning outcomes of the module.

Supplemental Information

Programme Board	Biological Sciences and Health
Assessment Results (Pass/Fail)	No
Subject Panel	Biology L7-11
Moderator	Gail McGarvie
External Examiner	D Stobo
Accreditation Details	This module is part of the BSc (Hons) Applied Bioscience and BSc (Hons) Applied Bioscience with Forensic Investigation programmes; accredited by Royal Society of Biology (RSB). This module is part of the BSc (Hons) Environmental Health with Professional Practice programme; accredited by The Royal Environmental Health Institute of Scotland (REHIS).
Changes/Version Number	1.14 Delivery method changed to HybridO

Assessment: (also refer to Assessment Outcomes Grids below)

Two case study assignments each worth 50% of the final mark.

(N.B. (i) **Assessment Outcomes Grids** for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed.

(ii) An **indicative schedule** listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Handbook.)

Assessment Outcome Grids (Footnote A.)

Component 1

Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Learning Outcome (5)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Portfolio of written work	✓	✓	✓	✓	✓	100	2
Combined Total For All Components						100%	2 hours

Footnotes
A. Referred to within Assessment Section above
B. Identified in the Learning Outcome Section above

Note(s):
1. More than one assessment method can be used to assess individual learning outcomes.
2. Schools are responsible for determining student contact hours. Please refer to University Policy on contact hours (extract contained within section 10 of the Module Descriptor guidance note).
   This will normally be variable across Schools, dependent on Programmes &/or Professional requirements.

Equality and Diversity

In line with current legislation (Equality Act, 2010) and the UWS Equality, Diversity, and Human Rights Code, our modules are accessible and inclusive, with reasonable adjustment for different needs where appropriate. Module materials comply with University guidance on inclusive learning and teaching, and specialist assistive equipment, support provision and adjustment to assessment practice will be made in accordance with UWS policy and regulations. Where modules require practical and/or laboratory based learning or assessment required to meet accrediting body requirements the University will make reasonable adjustment such as adjustable height benches or assistance of a 'buddy' or helper.
Please refer to the UWS Equality and Diversity Policy at the following link: UWS Equality and Diversity Policy

UWS Equality and Diversity Policy

(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)