Module Descriptor

Title	Applied Microbiology		
Session	2026/27	**Status**	Published
Code	BIOL09005	**SCQF Level**	9
Credit Points	20	**ECTS (European Credit Transfer Scheme)**	10
School	**Health and Life Sciences**		
Module Co-ordinator	Roderick Williams		

Summary of Module

In this module, students will be introduced through lectures and practical sessions required to the role(s) of microorganisms in industrial and pharmaceutical processes. Emphasis will be placed on:

Cleaning processes such as disinfection and sterilisation protocols that are essential in the food, health care and pharmaceutical industries for health protection.

The generic fermentation process for food production including instrumentation.

Selected industrial processes which exploit microorganisms' inherent metabolic activities for the biosynthesis of secondary metabolites such as organic acids and antibiotics.

Mechanisms of action of antibiotics, the development of resistance to antibiotics and assay methods for quantification of antibiotics and small-scale production of the antibiotic, penicillin.

The association of microorganisms with and the mechanism of food spoilage, the potential to spoilt food to cause morbidity/mortality and the important measures available for the prevention of food spoilage e.g. preservation, pasteurisation, drying, and canning.

Use of standard microbiological protocols to prepare selective/differential media and use them to isolate bacteria from different food types and count bacteria.

This module will work to develop a number of the key “I am UWS” Graduate Attributes to make those who complete the module, have Universal skills, that will make them Work Ready and Successful.

Module Delivery Method	On-Campus[1] ☒	Hybrid[2] ☐	Online[3] ☐	Work -Based Learning[4] ☐
Campuses for Module Delivery	☐ Ayr ☐ Dumfries	☒ Lanarkshire ☐ London ☐ Paisley	☐ Online / Distance Learning ☐ Other (specify)	

Terms for Module Delivery	Term 1	☒	Term 2	☐	Term 3	☐
Long-thin Delivery over more than one Term	Term 1 – Term 2	☐	Term 2 – Term 3	☐	Term 3 – Term 1	☐

Learning Outcomes	
L1	Describe the principles and practices of selected industrial, pharmaceutical and food processes.
L2	Describe the applications and roles of selected microorganisms in these processes.
L3	Perform and report on laboratory techniques and methods as scientific reports.
L4	Demonstrate competency in a range of standard microbiological techniques according to protocols to minimise infection in accordance with local microbiological safety regulations.
L5	

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 9** Demonstrate knowledge and understanding of essential facts and principles in respect of industrial processes.
Practice: Applied Knowledge and Understanding	**SCQF 9** Use this knowledge gained to develop solutions to practical problems in a routine but unfamiliar context.
Generic Cognitive skills	**SCQF 9** Link together different content strands when writing standard scientific reports.

[1] Where contact hours are synchronous/ live and take place fully on campus. Campus-based learning is focused on providing an interactive learning experience supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus contact hours will be clearly articulated to students.

[2] The module includes a combination of synchronous/ live on-campus and online learning events. These will be supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus and online contact hours will be clearly articulated to students.

[3] Where all learning is solely delivered by web-based or internet-based technologies and the participants can engage in all learning activities through these means. All required contact hours will be clearly articulated to students.

[4] Learning activities where the main location for the learning experience is in the workplace. All required contact hours, whether online or on campus, will be clearly articulated to students

Communication, ICT and Numeracy Skills	**SCQF 9** Be able to communicate effectively in writing scientific reports using data analysis, statistics and be able to communicate their findings orally.
Autonomy, Accountability and Working with Others	**SCQF 9** Be able to work individually or in teams as appropriate, demonstrate an ability to organise time management and negotiating skills.

Prerequisites	**Module Code** BIOL08004	**Module Title** Introductory Microbiology
	Other Students are recommended to have taked Introductory Microbiology, BIOL08004, prior to taking this module	
Co-requisites	**Module Code**	**Module Title**

Learning and Teaching
In line with current learning and teaching principles, a 20-credit module includes 200 learning hours, normally including a minimum of 36 contact hours and maximum of 48 contact hours. This module will be delivered using lectures, tutorials and practical sessions. Students will be required to access lecture notes, links to reference sources and other support materials on VLE. This will provide students with core material which forms the basis of the syllabus and supplementary material to broaden their reading within the subject. Lectures will deliver fundamental information which will assist students in understanding key concepts relevant to the diversity and exploitation of microbial metabolism in a wide range of sectors. Practical sessions will allow students to develop their laboratory skills in areas such as the use selective/differential media for isolation and identification of microorganisms, assays for the determining microbial sensitivities and/or metabolite production levels. The class test will provide an opportunity for students to demonstrate theoretical knowledge and critical or analytical skills related to the utilisation of that knowledge within microbiological research and commercial/industrial/clinical processes. The scientific laboratory report will allow students to develop their data handling, presentation, critical analysis skills and the use of statistics for comparative analysis. Writing of the scientific laboratory report will provide students with the opportunity to develop the ability to use information from research articles, adapt and transfer the knowledge into the new context provided by the lab exercises. Tutorials will be provided to support development of the skills required to complete the scientific laboratory report.

Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	**Student Learning Hours** (Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture / Core Content Delivery	24
Laboratory / Practical Demonstration / Workshop	24
Independent Study	152

n/a	
n/a	
n/a	
TOTAL	200

Indicative Resources
The following materials form essential underpinning for the module content and ultimately for the learning outcomes: Hugo, W. B. and Russell, A.D. (1998 6th edition) Pharmaceutical Microbiology Waites, M. J., Morgan, N.L., Rockey, J.S., and Higton, G. (2006) Industrial Microbiology. An Introduction Blackwell Jay, J.M., Loessner, M.J., and Golden,D.A. (2005 7th Edition) Modern Food Microbiology. Springer Sprenger, R.A. 2009 15th edition) Hygiene for Management Highfield.CO.UK Limited
(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)

Attendance and Engagement Requirements
In line with the Student Attendance and Engagement Procedure, Students are academically engaged if they are attending and participating in all timetabled programme activities including on-campus and online teaching sessions, asynchronous online learning activities, placement, work-based elements, course-related learning resources, and complete assessments and submit these on time. **For the purposes of this module, academic engagement equates to the following:** Attendance at all synchronous sessions (lectures, tutorials and practicals), completion of asynchronous activities, and submission of assessments to meet the learning outcomes of the module. This module has a practical element as part of the Royal Society of Biology (RBS) and the Instutute of Biomedical Science (IBMS) accreditation which must be attended.

Equality and Diversity
The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: UWS Equality, Diversity and Human Rights Code. 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.
(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)

Supplemental Information

Divisional Programme Board	**Biological Sciences Health**
Overall Assessment Results	☐ **Pass / Fail** ☒ **Graded**
Module Eligible for Compensation	☒ **Yes** ☐ **No** **If this module is eligible for compensation, there may be cases where compensation is not permitted due to programme accreditation requirements. Please check the associated programme specification for details.**
School Assessment Board	Biology
Moderator	Fiona Menzies
External Examiner	S Haliti
Accreditation Details	IBMS/ HCPC/ RSB
Module Appears in CPD catalogue	☐ **Yes** ☒ **No**
Changes / Version Number	4

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
One class test which contributes 30% to the module mark
Assessment 2
Two Laboratory reports will contribute 70% to the module mark.
Assessment 3
Competency in technical laboratory skills e.g. pipetting, dilutions, aseptic techniques, assays (chemical and biological). 0% of final mark (pass/fail)
(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 Module Handbook.)

Component 1							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Class test (written)	☒	☒	☒	☒	☐	30	2

Component 2							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Report of practical/ field/ clinical work	☐	☐	☒	☒	☐	70	14

Component 3

Assessment Type	LO1	LO2	LO3	LO4	LO5	Weighting of Assessment Element (%)	Timetabled Contact Hours
Clinical/ Fieldwork/ Practical skills assessment/ Debate/ Interview/ Viva voce/ Oral	☐	☐	☒	☒	☐	0	0
Combined total for all components						100%	16 hours

Change Control

What	When	Who