APPROVED

MCBL S7001: Applied Microbiology

Module Details

Module Code:	MCBL S7001
Full Title:	Applied Microbiology APPROVED
Valid From::	Semester 1 - 2018/19 (September 2018)
Language of Instruction:	
Duration:	1 Semester
Credits::	7.5
Module Owner::	Bridget Kelly
Departments:	Unknown
Module Description:	This module aims to provide the student with the essential features of microbiology relevant to the food and pharmaceutical industries. Students will also be introduced to microbial ecosystems and methods in microbial ecology.

Module Learning Outcome	
On successful completion of this module the learner will be able to:	
#	**Module Learning Outcome Description**
MLO1	Classify types of foodborne disease providing examples and identify the major methods of food preservation used to avert foodborne disease.
MLO2	Identify the major microorganisms of concern in drinking water and water used for commercial and recreational purposes, and summarise the primary methods of assessing microbiological quality of water.
MLO3	Discuss microbial contamination of pharmaceutical products, select control strategies applicable for pharmaceutical manufacture and describe how these methods can be evaluated.
MLO4	Describe microbial diversity and community development in the environment and methods used to evaluate this.
MLO5	Select and apply appropriate laboratory procedures for the microbiological examination of various products, demonstrating whether that product meets the appropriate microbiological production and safety criteria and is compliant with legislation.

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named DkIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).*
No recommendations listed

Module Indicative Content
Food Microbiology Food ecology, food preservation, food spoilage, foodborne disease: foodborne infection, foodborne intoxication, foodborne toxicoinfection, Legislation.
Public Health and Water Quality Enterobacteriaceae, Coliforms, Escherichia coli, Indicator organisms, Water borne diseases, Microbiological examination of water, Legislation.
Pharmaceutical Microbiology Microbial product contamination, biocides as antiseptics, disinfectants and preservatives. Sterile products, sterilisation processes, bioburden and sterility assurance. European Pharmacoepia, microbiological legislation.
Microbial Ecology Microbial ecology/diversity, Microbial communities and ecosystems, Community organisation and interactions – biofilm, bioaggregates. Methods in microbial ecology.
Practical Component Applied Microbiology practicals will align with theory and will be selected from the following: Methods for the microbiological analysis of: foods; pharmaceutical products and water; Environmental monitoring; validation of sterilisation procedures and sterility testing; dairy microbiology; Winogradsky column preparation; molecular methods for detection of microbes.
Teaching and Learning Strategy Blended and flexible learning will be used throughout. This will take the form of face to face interactive lecture sessions complemented by various online resources. Group and peer learning will be facilitated in and out of class via use of discussion forums, wiki's blogs etc.

Module Assessment

Assessment Breakdown	%
Project	20.00%
Practical	30.00%
Final Examination	50.00%

Module Special Regulation

Assessments

Full Time On Campus

No Course Work

Project

Assessment Type	Group Project	**% of Total Mark**	20
Marks Out Of	0	**Pass Mark**	0
Timing	n/a	**Learning Outcome**	1,2,3,4
Duration in minutes	0		

Assessment Description
Students will conduct research and produce group report on an area relevant to current trends in applied microbiology. Students will also individually present on an aspect of the report.

Practical

Assessment Type	Practical/Skills Evaluation	**% of Total Mark**	30
Marks Out Of	0	**Pass Mark**	0
Timing	n/a	**Learning Outcome**	2,3,5
Duration in minutes	0		

Assessment Description
Students will participate in laboratory based practical sessions. Formative assessments will be performed (e.g. quizzes, review exercises) Summative assessment may take the form of graded laboratory reports and/or graded lab skill assessments

Final Examination

Assessment Type	Formal Exam	**% of Total Mark**	50
Marks Out Of	0	**Pass Mark**	0
Timing	End-of-Semester	**Learning Outcome**	1,2,3,4
Duration in minutes	0		

Assessment Description
End-of-Semester Final Examination

Module Workload

Workload: Full Time On Campus					
Workload Type	*Contact Type*	*Workload Description*	*Frequency*	*Average Weekly Learner Workload*	*Hours*
Lecture	Contact	No Description	Every Week	3.00	3
Practical	Contact	No Description	Every Week	3.00	3
Directed Reading	Non Contact	No Description	Every Week	2.00	2
Independent Study	Non Contact	No Description	Every Week	4.00	4
				Total Weekly Learner Workload	12.00
				Total Weekly Contact Hours	6.00

This module has no Part Time On Campus workload.

Module Resources

Recommended Book Resources

Madigan, M. T., Bender, K. S., Buckely, D. H., Sattley, W. M. and Stahl, D. A.. (2017), Brock: Biology of Microorganisms., 15th. Pearson Education, p.1136, [ISBN: 9780134626352].

Ray, B., Bhuna, A.. (2007), Fundamental Food Microbiology, 4th. CRC Press, [ISBN: 978-0849375293].

McLandsborough, L.. (2003), Food Microbiology Laboratory, 1st. CRC Press, [ISBN: 978-0849312670].

Hanlon, G., Hodges, N.. (2012), Essential Microbiology for Pharmaceutical Science, 1st. Wiley-Blackwell, [ISBN: 978-0470665343].

Barton, L. L. and Northup, D. A.. (2011), Microbial Ecology, 1st.

Kelly, Bridget. (2018), Applied Microbiology Laboratory Manual, DkIT.

Recommended Article/Paper Resources

International Journal of Food Microbiology. International Journal of Food Microbiology, International Journal of Food Microbiology, http://www.journals.elsevier.com/interna tional-journal-of-food-microbiology/

Food Microbiology. Food Microbiology, Food Microbiology, http://www.journals.elsevier.com/food-mi crobiology/

Microbial Ecology. Microbial Ecology, Microbial Ecology, https://link.springer.com/journal/248

Other Resources

Website, Wiley. Study guide for textbook Essential Microbiology for Pharmaceutical Science, http://www.wiley.com/go/hanlon/essential microbiology

Website, SfAM. Society for Applied Microbiology, http://www.sfam.org.uk

Website, SGM. SGM- Society for General Microbiology, http://www.sgm.ac.uk

Website, ICMSF. ICMSF: International Commission on Microbiological Specifications for Foods, http://www.icmsf.iit.edu

Website, HPA. Health Protection Agency United Kingdom, http://www.hpa.org.uk

Website, FSAI. The Food Safety Authority of Ireland, http://www.fsai.ie

Website, CDC. Centers for Disease Control and Prevention, http://www.cdc.gov

Website, HPSC. Health Protection Surveillance Centre, http://www.hpsc.ie