

Liverpool John Moores University

Title: General Microbiology
Status: Definitive
Code: **5018BMBMOL** (117421)
Version Start Date: 01-08-2014

Owning School/Faculty: Pharmacy & Biomolecular Sciences
Teaching School/Faculty: Pharmacy & Biomolecular Sciences

Team	Leader
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Academic Level: FHEQ5 **Credit Value:** 24.00 **Total Delivered Hours:** 62.00
Total Learning Hours: 240 **Private Study:** 178

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	30.000
Practical	27.000
Workshop	3.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Theory	theory exam	60.0	2.00
Test	Physiology	physiology test	20.0	
Practice	Ecology	ecology practice	20.0	

Aims

To demonstrate the fundamental principles of bacterial and fungal physiology with

reference to nutrition, growth and metabolism. To provide a general introduction to the ecology of microorganisms in a variety of habitats.

Learning Outcomes

After completing the module the student should be able to:

- LO1 Summarize the major catabolic and anabolic pathways.
- LO2 Describe bacterial and fungal growth
- LO3 Show how microorganisms are adapted for life in different habitats.
- LO4 Relate the complexity of natural environments to the problems encountered when studying the ecology of the microflora inhabiting such environments.
- LO5 Assess the effects of bacteria and fungi on nutrient cycling and bioremediation
- LO6 Discuss the role of micro-organisms in causing disease.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Exam	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
physiology test	LO 1	LO 2				
Ecology practice	LO 3	LO 4				

Outline Syllabus

Fungal and bacterial growth. Population growth in batch and chemostat culture; cell cycle; fungal and bacterial cell wall synthesis and assembly; growth and branching of fungal hyphae.

Metabolism and nutrition. Substrate uptake; principles of bioenergetics, energy sources, pathways of carbohydrate breakdown, aerobic and anaerobic respiration, fermentation pathways. Biosynthesis of monomers and polymers. Regulation of metabolism. Fermentation processes. Microbial products : for example, antibiotics, enzymes, single-cell protein.

Natural environments for microorganisms; qualitative and quantitative features of microbial populations inhabiting such environments; biofilms.

Effects of physico-chemical conditions on microbial activity: pH, temperature, aeration, water potential, nutrient availability; extreme environments.

Food spoilage, food poisoning, food preservation.

Methods used for the study of microorganisms in their natural environments: isolation methods; microbial biomass and activity determinations.

Microbial activities of ecological importance: carbon, nitrogen, sulphur and phosphorus cycles; degradation of man-made compounds; waste-water and sewage treatment.

Learning Activities

Learning Activities:

Lectures, practicals, computer-aided learning

References

Course Material	Book
Author	Atlas R M, Bartha R (1998)
Publishing Year	1998
Title	Microbial Ecology - Fundamentals and Applications
Subtitle	
Edition	4th
Publisher	Benjamin Cummings
ISBN	0-8053-0655-2

Course Material	Book
Author	Deacon J
Publishing Year	2005
Title	Fungal Biology
Subtitle	
Edition	4th
Publisher	Blackwell
ISBN	1-4051-3066-0

Course Material	Book
Author	Madigan M.T., Martinko J.M., Dunlap, P.V. & Clark, D.P.
Publishing Year	2009
Title	Brock - Biology of Micro-organisms
Subtitle	
Edition	12th
Publisher	Pearson Education
ISBN	0-321-53615-0

Course Material	Book
Author	Montville T J and Mathews K R.
Publishing Year	2005
Title	Food Microbiology.
Subtitle	An Introduction
Edition	2nd
Publisher	ASM Press
ISBN	1-55581-308-9

Notes

This module is designed to develop an understanding of the physiology and behaviour of microorganisms populating various habitats with emphasis on their responses to particular physical and chemical conditions.