

<b>Semester</b>	2		
<b>Course Code:</b>	MIBI 12514		
<b>Course Name:</b>	Diversity of Bacteria, Virus and Fungi		
<b>Credit Value:</b>	4		
<b>Core/Optional</b>	Core		
<b>Hourly Breakdown</b>	Theory	Practical	Independent Learning
	60 hrs	-	140 hrs
<b>Course Aim/Intended Learning Outcomes:</b>			
Upon successful completion of this course student will be able to;			
<ul style="list-style-type: none"> <li>• Discuss the major differences and criteria used in taxonomic divisions of the current classification system,</li> <li>• Describe major characteristics of some selected groups of Eubacteria,</li> <li>• Describe major characteristics of Archaea,</li> <li>• Describe cultural and molecular methods used to differentiate bacteria,</li> <li>• Develop phylogenetic relationships in selected groups of bacteria,</li> <li>• Describe the applications and importance of bacteria in different fields,</li> <li>• Describe importance of fungi as a group of microorganisms,</li> <li>• Describe basic characteristics of fungi,</li> <li>• Describe morphological diversity of fungi,</li> <li>• Describe how morphological diversity is used in fungal classification,</li> <li>• Describe basic characteristics of the fungal subdivision and their typical lifecycles,</li> <li>• Explain the properties and the structure of viruses and identify the rationales of the schemes used in viral classification,</li> <li>• Describe the common stages of a viral life cycle and explain replication strategies used by viruses belonging to different Baltimore groups and</li> <li>• Discuss the strategies used in developing antiviral vaccines and antiviral drugs.</li> </ul>			
<b>Course Content:</b>			
<b>Diversity of bacteria:</b>			
Introduction to taxonomy; Taxonomic ranks, Problems of bacterial taxonomy, major characteristics used in bacterial taxonomy. Systematic study of important groups of chemoorganotrophic bacteria: Enterobacteriaceae, Lactobacillaceae, Bacillaceae, Micrococcaceae and Pseudomonadaceae, Photosynthetic bacteria and Archaeobacteria. Characteristics of algae, major divisions of algae. Characteristics of unicellular algae and a brief study of cyanobacteria.			
<b>Diversity of fungi:</b>			
Introduction to Mycology. Importance of fungi. Basic cellular structure of fungi. Basic morphology of fungal thalli – Unicellular, Multicellular. Hyphal modifications. Hyphal aggregations. Different types of asexual spores fungi produced. Different types of sexual spores fungi produced. Asexual reproduction modes of fungi. Parasexual cycle. <i>Fungal classification</i> : Basic characteristics of fungal Divisions – Muxomycota, Eumycota. Basic characteristics of subdivisions – Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina, Duteromycotina. Associations fungi make with other organisms.			
<b>Diversity of viruses:</b>			
Structure of viruses, Classification of viruses: criteria used for the virus classification, Baltimore classification and ICTV (International Committee on Taxonomy of Viruses) classification, Techniques used to study viruses, Life cycle of a virus: general overview, study on the life cycles of selected viruses of each Baltimore group, Viroids and Prions, Antiviral agents: antiviral vaccines and antiviral chemotherapy			
<b>Teaching /Learning Methods:</b> A combination of lectures and tutorials			
<b>Assessment Strategy:</b> Continuous assessment and end of the course unit examination.			
<b>Continuous Assessment</b>		<b>Final Assessment</b>	
15%		85 %	
Details:	Theory (%)	Practical (%)	Other (%)
Mid-term Exam: 10% Quiz: 5%	85	-	-
<b>Recommended Reading:</b>			
<ul style="list-style-type: none"> <li>• Madigan, M.T., Martinko, J.M., Bender, K.S., Buckley, D.H., and Stahl, D.A. (2015) <i>Brock Biology of</i></li> </ul>			

*Microorganisms*. 15<sup>th</sup> edition. Pearson Education Inc.

- Tortora, G.J., Funke, B.R. and Case, C.L. (2010) *Microbiology: An Introduction*. 10<sup>th</sup> Edition. Pearson Education, Inc.
- Acheson, N.H. (2011). *Fundamentals of Molecular Virology*. 2<sup>nd</sup> ed. John Wiley & Sons.
- Alexopoulos, C.J. and Mims C.W. (2007) *Introductory Mycology*. 4th Edition. M. Blackwell Wiley
- Aneja, K.R. and Mehrotra, R.S. *An Introduction to Mycology*. New Age International Publishers
- Dimmock, N.J., Easton, A.J. and Leppard, K.N. (2016). *Introduction to Modern Virology*. 7<sup>th</sup> ed. Wiley-Blackwell.
- 'Virus Taxonomy Release' of the current year by the International Committee on Taxonomy of Viruses - <https://talk.ictvonline.org/taxonomy/>