

Branch Name:	B.Sc. Microbiology
Program Code:	SC202
Course Name:	Microbial Diversity
Course Code:	2SC1020601
Pre-requisite Course:	Fundamental of Microbiology

Course Objective:

1. To understand basic information to origin and diversity of microbes
2. To understand characteristics of various microorganisms other than bacteria
3. To understand the concepts of taxonomy and phylogenetic relationships between various domains
4. To understand the diversity amongst the different domains and diversity in-between the same domain
5. To enable the students useful and harmful effects of microorganisms on other organisms of various domains

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
3	--	--	3	70	30	-	-	100

Subject Contents:

Unit	Content	Lectures	Weightage
1	INTRODUCTION TO MICROBIAL DIVERSITY • Introduction to Biodiversity- Microbial evolution and diversity; Major domains of life; Overview of the functional and metabolic diversity between- the similar domains and the different domains • Microbial Taxonomy: Major characteristics used in taxonomy classical and molecular; Classification systems-phenetic, numerical and phylogenetic; Taxonomic ranks of microorganisms • ARCHAEA: General Characteristics- Difference between Archaea and Bacteria, Major divisions of Archaea: <i>Euryarchaeota</i>, <i>Thaumarchaeota</i>, <i>Nanoarchaeota</i>, and <i>Korarchaeota</i>, <i>Crenarchaeota</i> Evolution and Life at High Temperatures: Molecular adaptations and Hyperthermophilic Archaea	15	34%
2	EUKARYOTIC DIVERSITY • FUNGI: General characteristics – Definition, occurrence, Structure, reproduction, Classification and introduction to major divisions of Fungi; Economic importance of fungi • ALGAE: General Characteristics – Definition, reproduction Occurrence, Ultra Structure, Economic importance of Algae	15	33%

	• PROTOZOA: General Characteristics – Definition, Occurrence, Ultra Structure, reproduction, Economic importance of Protozoa		
3	AKARYOTIC DIVERSITY-(VIRUSES) • Introduction and General Characteristics: Definition, Structure, Classification • Cultivation and Enumeration of Viruses. Viroids and Prions • Bacterial Viruses: Classification, Lytic life cycle (T4 phage), lysogenic life cycle • Plant Virus: TMV, CMV • Animal Virus: Poliovirus, HIV	15	33%

Text books:

1. Michael Pelczar, text book of microbiology, 5thed.
2. Microbiology by R.M.Atlas (1996).

Reference Books:

1. Madigan MT, and Martinko J M (2014). Brock Biology of Microorganisms. 14th edition. Prentice Hall International Inc.
2. Willey JM, Sherwood LM, and Woolverton CJ. (2013). Prescott's Microbiology. 9th edition. McGraw Hill Higher Education

List of Open Source Software/learning website:

<https://archive.nptel.ac.in/courses/102/103/102103015/>

https://onlinecourses.nptel.ac.in/noc21_ce07/preview

<https://www.studocu.com/in/document/amity-university/microbiology/diversity-of-microbial-world/4680392>

<https://academic.oup.com/book/504/chapter-abstract/135265982?redirectedFrom=fulltext>

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Categorize and classify various domains on the basis of their characteristics, and illustrate their classical and molecular characters for the classification of different living organisms	1 Remembering 2 Understanding 3 Applying 4 Analyzing
CLO2	Compare physiology of the organisms of same and/or different domains, illustrate the classification of organisms on the basis of taxonomic rank	1 Remembering 2 Understanding
CLO3	Categorize and classify Eukaryotic organisms, Classify the fungi on the basis of phenotypic characters, and illustrate the economic importance of fungi, and clinically important fungi	1 Remembering 2 Understanding
CLO4	Classify the fungi on the basis of phenotypic characters, and illustrate the economic importance of fungi, and clinically important fungi	1 Remembering 2 Understanding
CLO5	Categorize and classify akaryotic organisms, Classify the virus on the basis of the nucleic acid material, and illustrate the clinical importance of viruses	1 Remembering 2 Understanding 3 Applying 4 Analyzing 5 Evaluating

CLO6	Illustrate the viruses that can cause infections to bacteria, plants, and animals	3 Applying 2 Understanding 4 Analyzing 5 Evaluating 6 Creating
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Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)									Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3
CLO1	M	M				M		M				
CLO2	H	H	M		M			L	M			
CLO3	M	M	H					M	M		M	
CLO4	M				M				H	M		
CLO5	M		H		M					H		
CLO6				H		M	H		H		H	M

L= Low M= Medium H= High