

As Per NEP 2020

University of Mumbai



Syllabus for Basket of MINOR	
Board of Studies in Microbiology	
UG First Year Programme	
Semester 2	
Title of Paper	Credits
Introduction to Microbial World	2
From the Academic Year	2024-25

Title of Paper: Introduction to Microbial World

Sr. No.	Heading	Particulars
1	Description the course : Including but Not limited to :	The omnipresence of microorganisms makes the study of microbiology very important for society as a whole. The study involves a history of Microbiology and an introduction to microbial cells and groups. The course also includes important fields of Microbiology like Environmental, Agricultural and Medical microbiology The interdisciplinary nature of the subject is relevant to all fields including Chemistry, Biochemistry, Biophysics , Bioinformatics , Biostatistics , Nanotechnology and Pharmaceutical sectors . To summarize, the subject contributes to community welfare with respect to prevention, control and treatment of diseases, development of sustainable agricultural practices, and monitoring of the environment with green technology.
2	Vertical :	Minor
3	Type :	Theory
4	Credit:	2 credits (1 credit = 15 Hours for Theory in a semester)
5	Hours Allotted :	30 Hours
6	Marks Allotted:	50 Marks

7	Course Objectives: CO1. To introduce cross faculty students to the microbial world. CO2. To narrate the history of Microbiology and groups of microorganisms. CO3. To explain the role of microbes in improving soil fertility . CO4. To emphasize the role of microbes in production of biopesticides. CO5. To make learners aware of the role of microbes in transmitting air borne diseases. CO6 To impart knowledge about the role of microbes in common infectious diseases.
8	Course Outcomes: On completion of this course learner will be able to: OC1. remember history of Microbiology and groups of microorganisms. OC2. comprehend the Science of Microbiology and its applications in various fields. OC3. apply their knowledge gained to prevent water and air borne diseases. OC4. differentiate between various groups of microorganisms on the basis of their structural characteristics. OC5. evaluate the significance of microbes in diverse fields. OC6. develop application-based study of microorganisms.
9.	Modules

Semester	Paper	Module	Description	Credits
II	Minor Course Introduction to Microbial World	1.	The Science of Microbiology	02
		2.	Fields of Microbiology	

Course code		SEMESTER II	Credits
		Minor Course Introduction to Microbial World	Credits 2 (30 L/hr)
Module 1		The Science of Microbiology	15L
	1.1	The Historical Roots of Microbiology: Hooke, van Leeuwenhoek, and Cohn	2L
	1.2	Pasteur and the Defeat of Spontaneous Generation	2L
	1.3	Microbial Cells- The invisible world	1L
	1.4	Groups of microorganisms : 1.4.1 Fungi 1.4.2 Protozoa 1.4.3 Algae and Cyanobacteria	10L

		1.4.4 Bacteria 1.4.5 Viruses	
Module 2		Fields of Microbiology	15L
	2.1	Environmental Microbiology 2.1.1 Soil : Concept of Nutrient recycling , Biogeochemical cycle (Nitrogen ,Carbon, Phosphorus). 2.1.2 Water : Definition and characteristics of Potable water , Bacterial diseases transmitted by fecally contaminated water (tabulation). 2.1.3 Air : Terms used: aerosols/ droplet / droplet nuclei , Air borne diseases transmitted by exhalation droplets	5L
	2.2	Agricultural Microbiology 2.2.1 Introduction to Biofertilizers and their advantages over chemical fertilizers 2.2.2 Nitrogen fixation (<i>Rhizobium</i> and <i>Azotobacter</i>) , Phosphorus and Potassium solubilizers. 2.2.3 Introduction to Biopesticides and their advantages over chemical pesticides 2.2.4 <i>Bacillus thuringiensis</i> as an example of biopesticide 2.2.5 Common plant pathogens (Tabulation)	5L
	2.3	Medical Microbiology Common communicable diseases with respect to Causative agents, Symptoms, Treatment and Prevention 2.3.1 Bacterial: Tuberculosis 2.3.2 Protozoal: Malaria 2.3.3 Viral: Influenza	5L
References			
1.	Lansing M. Prescott, Harley and Klein, Microbiology (2005),6th Edition. McGraw Hill Higher Education, New York.		
2.	Michael J.Pelczar Jr., E.C.S. Chan ,Noel R , Microbiology TMH 5th Edition.		
3.	Michael T. Madigan & J.M. Martin, Brock's Biology of Microorganisms 13th Ed. International edition 2012, Pearson Prentice Hall.		
4.	R C Dubey and Dr D K Maheshwari,A textbook of Microbiology - (S Chand Pub)		
5.	Frobisher, Hinsdill ,Crabtree , Good heart , Fundamentals of Microbiology , 9th Edi WB Saunders Company.		
6.	Raina M. Maier , Ian L. Pepper, Charles P. Gerba , Terry J. Gentry, Environmental Microbiology , 3rd edition, Academic press.		

Guidelines for examination and evaluation (External and Internal)

Evaluation Pattern for Minor course (Microbiology)

Semester 2

Theory	Credits	No. of Hours	Marks
Theory Paper	2	30	50

Theory courses

Internal Continuous Assessment: 40% (20 Marks)	Semester End Examination: 60% (30 Marks)	Duration for End semester examination
Continuous Evaluation through: Quizzes, Class Tests, presentation, project, role play, creative writing, assignment etc.	As per paper pattern*	1hour

***Paper Pattern for 30 marks :**

30 Marks per paper Semester End Theory Examination:

Duration - These examinations shall be of one hour duration

Question	Option	Marks	Questions Based on
Q1A	Attempt any two out of four (5 marks each)	10	Based on Module 1
Q1B	Attempt any five out of ten objective (MCQ type only) questions (1 marks each)	5	Based on Module 1
Q2A	Attempt any two out of four (5 marks each)	10	Based on Module 2
Q2B	Attempt any five out of ten objective (MCQ type only) questions (1 marks each)	5	Based on Module 2
	Total	30	

**Sign of the BoS
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