

AC – 20/04/2024

Item No. – 6.6 Sem. I (12a)

As Per NEP 2020

University of Mumbai



Syllabus for Basket of OE	
Board of Studies in Microbiology	
UG First Year Programme	
Semester 1	
Title of Paper	Credits 2/ 4
I) Microbes at work	2
II)	
From the Academic Year	2024-25

Title of Paper: Microbes at work

Sr. No.	Heading	Particulars
1	Description the course : Including but Not limited to :	The aim of this course <i>Microbes at Work</i> is to introduce the learner to Microbiology and its scope in industry . The course also emphasizes the use of microorganisms in sustainable agriculture . The learners will gain knowledge about important groups of microorganisms associated with various fields of Microbiology . They will appreciate the impact of microorganisms in the food and pharma industry.
2	Vertical :	Open Elective
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 enable learners gain knowledge about the branches and scope of microbiology CO2. To teach the major groups of microbes. CO3. To give an overview of the scope and branches of Microbiology. CO4. To emphasize the beneficial role of microbes in the environment and pharmaceutical industry. CO5. To explain the role of microbes in sustainable agricultural practices CO6. To make learners aware of the role of microbes in food and dairy industry	
8	Course Outcomes: On completion of this course learner will be able to: OC1. recall various groups of microorganisms OC2 .understand the scope of Microbiology in various fields. OC3. apply the knowledge gained about the significance of microbes in industry. OC4. analyze the role of microbes in environment, agriculture, food , dairy and pharmaceutical industry OC5. evaluate the significance of microbes in human welfare OC6. elaborate on the role of microbes in various industries	

9.	Modules
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Course code		SEMESTER I	Credits
		Open Elective Course (Microbes at work)	Credits 2 (30 L/hr)
Module 1		Microbiology: Introduction and its Scope	15L
	1.1	Introduction to Microbiology	1 L
	1.2	List of important groups of useful microorganisms with examples a) Bacteria b) Fungi c) Actinomycetes d) Algae e)Cyanobacteria	1L
	1.3	Scope and branches of Microbiology. 1.3.1 Environmental Microbiology 1.3.2 Agricultural Microbiology 1.3.3 Dairy Microbiology 1.3.4 Food Microbiology 1.3.5 Pharmaceutical Microbiology	3L
	1.4	Environmental Microbiology 1.4.1 Microorganisms in composting 1.4.2 Microorganisms in wastewater treatment	5L
	1.5	Agricultural Microbiology 1.5.1 Microorganisms in improving soil fertility (nitrogen fixers , phosphate solubilizers) 1.5.2 Biofertilizers in sustainable agriculture 1.5.3 Biopesticides in eco friendly approaches	5L
Module 2		Microbes in Industry: Food and Pharmaceutical	15L
	2.1	Dairy Microbiology 2.1.1 Beneficial Microorganisms in milk and milk products 2.1.2 Significance of starter cultures in a.Production of butter b.Production of Curd (Dahi) c.Production of Cottage cheese (paneer)	5L
	2.2	Food Microbiology 2.2.1 Mushroom production 2.2.2 Fermented Beverages (beer and wine) 2.2.3 Bakery products (bread)	6L
	2.3	Pharmaceutical Microbiology 2.3.1 Antibiotics and drugs (Common uses) 2.3.2 Vaccines (Know your vaccines - WHO guidelines)	4 L

References	
1.	Dubey RC and Maheshwari DK (2005) A textbook of Microbiology, Revised Multi color Edition S. Chand Publishers, New Delhi.
2.	Frazier WC and Westhoff DC (1988) Food microbiology, TATA McGraw Hill Publishing Company Ltd. New Delhi
3.	Dubey RC (2014) Textbook of Biotechnology, Publisher: S Chand & Company P Ltd, New Delhi-55 ISBN: 81-219-2608-4
4.	Lansing M. Prescott, Harley and Klein, Microbiology (2005),6th Edition. McGraw Hill Higher Education, New York.
5.	Michael J.Pelczar Jr., E.C.S. Chan ,Noel R , Microbiology TMH 5th Edition.
6.	Factsheet for the general public - Antimicrobial resistance.

Guidelines for examination and evaluation (External and Internal)

Evaluation Pattern for OE courses (Microbiology)

Semester 1 and 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	

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