

CODE	COURSE TITLE
18BOPE201	MICROBES AND INDUSTRY

Category	CIA	ESE	L	T	P	Credit
Elective	25	75	85	5	-	4

Preamble

To study the Classification, Characteristics & Structure of industrially important microbes

To study the isolation, Identification & Production of potential microbes in industries

To develop the skill of manufacturing industrial products

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the structure and characteristics of microbes and analyse culture methods and measurement of bacteria	K2, K4
CO2	Acquire knowledge on the structure and reproduction and distinguish plant, animal and human virus	K2, K4
CO3	Develop skills on fermentation, screening and detection techniques for industrial products	K5
CO4	Identify, isolate and produce potential microbes used in industry	K3
CO5	Invent the microbial flora for soil fertility and to purify fresh water bodies	K5

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	S	M	S	M	M
CO3	S	S	S	S	S
CO4	S	S	S	M	S
CO5	S	S	S	S	S

S- Strong; M-Medium; L-Low

Syllabus

UNIT - I

(18 hrs.)

Bacteria - Classification of Bacteria (Bergey's, 1923) – Morphology and Ultra structure – Bacterial culture and cultural characteristics – Isolation and maintenance of pure culture – Growth curve of bacterial population - Quantitative measurement of bacterial growth – Economic importance of bacteria.

UNIT - II

(18 hrs.)

Viruses - Classification (Harrison et al., 1971) – Plant Virus – Classification of plant virus- Double strand RNA and DNA viruses - Cauliflower Mosaic Virus – Wound Tumour Virus – Bacteriophages

–Types of phages- Ss DNA Phages- Ds DNA Phages - Ss RNA Phages - DsRNAPhages-Morphology – structure and replication T2 and T4 phages.

UNIT - III

(18 hrs.)

Industrial microbiology - Scope of industrial microbiology - Development of industrial fermentation process – Screening - Detection and assay of fermentation products - Stock culture - Fermentation media - Inoculum preparation- Scale up of fermentations - Increasing product yield.

UNIT-IV

(18 hrs.)

Fermentation techniques – Types of Fermentation – Importance of microbial enzymes in industry – Industrial production of cellulolytic enzymes – Penicillin – Glutamic acid – Citric acid and Vitamin B12.

UNIT-V

(18 hrs.)

Microbiology of soil and water – Rhizosphere and Mycorrhizae – factors affecting microbial community in soil. Types of water – Fresh water microbiology – Purification of water.

Text Books

SL.No.	Author Name	Title of the Book	Publisher	Year and Edition
1.	J.M.Willey, L.M.Sherwood C.J.Woolverton	Prescotts Microbiology -	McGraw- Hill, Publisher	2012, 8 th Edition.
2.	Patel, A.H.	Industrial Microbiology	Macmillan	2012, 2 nd Edition
3.	Saravanan P.	Virology	MJP Publishers	2006,1 st Edition
4.	Pawar and Daginawala	General Microbiology	Himalaya Publishing House	1992, 8 th Edition

Reference Books

Sl.No.	Author Name	Title of the Book	Publisher	Year and Edition
1.	Pelczer, M.J. (Jr.), Chan, E.C.S. and Kreig, N.R.	Microbiology	Tata McGraw- Hill, New Delhi	1995, 3 rd Edition
2.	Casida, L.E.	Industrial Microbiology	Wiley Eastern Ltd., New Delhi	1968, 1 st Edition.

Web Resource

<https://graduatenotes.blogspot.com/2011/11/bergey-classification-of-bacteria.html>

www.biologydiscussion.com/viruses/bacteriophages-meaning-morphology.../34281

www.mitconbiopharma.com/wp-content/uploads/2015/08/Fermentation-3.pptx

<https://www.scribd.com/document/72527157/Industrial-Production-of-Penicillin>

<https://www.wiley.com/.../Freshwater+Microbiology%3A+Biodiversity+and+Dynamic...>

Pedagogy

Lecture- Chalk& Talk, PPT, Quiz, Assignment, Seminar, Group Discussion, Seminar,Industrial visit