

Open Elective Course Content

DEPARTMENT OF MICROBIOLOGY

Semester	I
Course	2
Paper Code	MBOE 1
Paper Title	Microbial Technology for Human Welfare
Number of teaching hours per week	03
Total number of teaching hours per semester	42
Number of credits	04

Learning outcomes:

This paper gives a bird's-eye view on the diversified microbes and their role in the field of food, agriculture and pharmaceutical industries. This paper also creates an awareness of the use and abuse of antibiotics and the development of antibiotic resistance.

UNIT-I Microbial Diversity	4
Introduction to microbial biodiversity: distribution, abundance, nutrition and types. Gut microbiota and its importance.	
UNIT-II Food and Fermentation Technology	12
Fermented Foods – Types, Nutritional Values, Advantages and Health Benefits	3
Prebiotics, Probiotics, Synbiotics and Nutraceutical Foods	3
Fermented Products – Alcoholic (wine) and non-alcoholic beverages (coffee), fermented food and dairy products (Idli, Bread, Yoghurt and Acidophilus milk), Fruit fermented drinks (Kombucha and Tepache)	6

UNIT-III Microbial Technology in Agriculture	13
Microbial Fertilizers – Definition and scope, applications, advantages and disadvantages. Vermicompost and Composting	4
Microbial Pesticides: Definition and scope, Importance of Bio-fungicide, Bio-herbicide, Bio-insecticide	4
Mushroom Cultivation: Examples, Nutritive values, Applications, Cultivation of paddy straw mushroom	3
Biogas Production and its applications	2
UNIT-IV Pharmaceutical Microbiology	13
Microbial Drugs – Types (Natural, Synthetic and Semi synthetic), Development of Drug Resistance	5
Antibiotics – Types, Functions, Use and abuse of Antibiotic Therapy	4
Vaccines – Types, Properties, Functions and Schedules	4

REFERENCES:

1.	Black, J.G. (2008). <i>Microbiology principles and explorations</i> (Edition). New Jersey: John Wiley and Sons Inc.,
2.	Cruger, W. and Crueger, A. (2000). <i>Biotechnology: A Text Book of Industrial Microbiology</i> , New Delhi: Panima Publishing Corporation.
3.	Dubey, R. C and D. K. Maheshwari, (1999). <i>A Textbook of Microbiology</i> . New Delhi: S. Chand & Company Ltd.,.
4.	Frazier, W. C., Westhoff, D. C. (1988). <i>Food Microbiology</i> , New York: McGraw-Hill.
5.	Maier, Pepper and Gerba, (2000). <i>Environmental Microbiology</i> , London: Academic Press.
6.	Michael J Pelczar, Chan and Noel R. Krieg; <i>Microbiology</i> , Uttar Pradesh: TATA McGraw-Hill publication. Prescott, Harley, Klein. (2008). <i>Microbiology</i> , New York:

	McGraw Hill.
7.	Rangaswami, G and Bagyaraj, D.J. (2010), <i>Agricultural Microbiology</i> , New Delhi: PHI Learning Pvt. Ltd.,.
8.	Stanier, Ingraham. (1987), <i>General Microbiology</i> . Noida: Macmillan education limited.
9.	Talaro, K. P. (2009). <i>Foundations in Microbiology</i> , New York: McGraw Hill.
10.	Tortora,G.J, Funke, B.R and C. L. Case. (2016). <i>Microbiology – An Introduction</i> , London: Pearson Education.

BLUE PRINT:

Code number: MBOE 1

Title of the Paper: Microbial Technology for Human Welfare

Chapter Number	Number of Hrs	Total marks for which the questions are to be asked (including bonus questions)
Unit I	4	9
Unit II	12	25
Unit III	13	27
Unit IV	13	27
	42	88
Maximum marks for the paper (Excluding bonus question) = 60		