

**Course Code : MIB 201**  
**Course Title : Agricultural Microbiology**  
**Course Hour : 2 (2+0) Full Marks: 50 Theory: 50 Practical: 00**

## OBJECTIVES

Upon the completion of this course is that the student will able to understand the fundamentals of agri microbiology, role of microbes to increase productivity, and soil fertility.

## I.SYLLABUS:

Introduction to microorganism, their distribution, historical background and its importance in Agriculture. Prokaryotic and Eukaryotic microorganisms, their cell structure and functions, Nutritional requirement and Genetics of Bacteria; Role of microorganisms in soil fertility and crop production, carbon, nitrogen and sulphur transformation. Plant microbes association: symbiotic, associative and non symbiotic nitrogen fixation, Azolla, blue, green algae and mycorrhiza; Plant Microbes Interaction: the rizosphere and phyllosphere effect and microbes; Microbial degradation of cellulose, starch, lipids, lignin, pectin and proteins present in organic residues. Introduction to Plant pathogenic microorganisms. Microbiology of milk and dairy products. Microbial Contamination of foods, food borne infection and toxins; Introduction to Sewage microbiology and role of microbes in Silage production, microbes for Bioassay and biological Warfare. Microorganisms in Economic use; (e.g. Food from microbes, microbes in retting of fibers, medicines, antibiotics, curing of tobacco and tea. Biopesticides and biofertilizer.

## II. COURSE OUTLINE

### A. Lectures

S.N.	Topic	No. of Lecture
1.	Introduction to microorganisms, their distribution,	1
2.	Historical background and their importance in agriculture.	1
3.	Prokaryotic and eukaryotic microorganisms;	1
4.	The cell structure of Prokaryotic and eukaryotic microorganisms	1
5.	The functions of Prokaryotic and eukaryotic microorganisms	1
6.	Nutritional requirements of bacteria	1
7.	Genetics of bacteria	1
8.	Role of Microorganisms in soil fertility and crop production:	1
9.	Carbon and nitrogen transformation	1
10.	Sulfur transformation	1
11.	Symbiotic Plant- microbes association	1
12.	Plant- microbes association; associative nitrogen fixation	1
13.	Plant- microbes association; non symbiotic nitrogen fixation	1
14.	Plant microbes interaction ; microbes effect	1

15.	Plant microbes interaction ; the Rhizosphere and Phyllosphere effect	1
16.	Microbial degradation of cellulose and starch in organic residues	1
17.	Microbial degradation of lipids and proteins present in organic residues	1
18.	Microbial degradation of lignin and pectin present in organic residues	1
19.	Introduction to plant pathogenic microorganisms	1
20.	Biodegradation of the agricultural chemicals	1
21.	Microbiology of milk	1
22.	Microbiology of milk products	1
23.	Microbial Contamination of foods, food borne infection and toxins	1
24.	Food borne infection and toxins	1
25.	Introduction to Sewage microbiology	1
26.	Introduction to Microorganism Bioassay and biological Warfare	1
27.	Introduction to Silage production	1
28.	Economics in food, fermentation	1
29.	Economics in medicine, antibiotic curing of tobacco and tea	1
30.	Economics in biopesticide and biofertilizers	1
<b>Total</b>		<b>30</b>

## REFERENCES

Collins, C. H., P. M. Lyrie and J. M. Crang. 1989. Micro-biological methods. Academic Press, New York.

Kamal, Pande, Rao. 2001. Introductory Microbiology and Plant Pathology (2<sup>nd</sup> ed.) Students-Friends Publishers. Allahabad.

Merchants I. A. and R. A. Palker, Veterinary bacteriology and virology. C. B. Publishers and Distributors. Delhi.

Pelczar, M. J., E. C. S. Chan and N. R. Kreig. 1993. Microbiology (5<sup>th</sup> ed.) McGraw-Hill Publishing Co. New Delhi.

Purohit S. S. 1990. Microbiology (3<sup>rd</sup> ed.). Agro-Botanical Publishers Vyas Nagar, Bikanagar.

Rangaswami, G. and Bagyaraj, D. J. 1992. Agricultural Microbiology. Asia Publishing House, New Delhi.