

Semester	4
Course	Skill
Paper Code	S2MB230411P
Paper Title	Agricultural Microbiology
No. of Credits	
Theory / Practical / Composite	Practical
Minimum No. of preparatory hours per week a student has to devote	
Number of Modules	No modules
Syllabus	<ol style="list-style-type: none"> 1. Introduction to Agricultural Microbiology. 2. General account of the microbes used as biofertilizers for various crop plants and their advantages over chemical fertilizers. 3. Symbiotic N₂ fixers: Cyanobacteria, <i>Azolla</i> - Isolation, characterization, mass multiplication, Role in rice cultivation and role in arsenic bioremediation. 4. Estimation of NPK and micronutrients in soil. Rectification/Restoration of soil fertility using residual microbes. 5. Importance of mycorrhizal inoculum, types of mycorrhizae and associated plants, mass inoculum production of VAM, field applications of Ectomycorrhizae and VAM. 6. Free living <i>Azospirillum</i>, <i>Azotobacter</i> - free isolation, characteristics, mass inoculums production and field application. 7. Phosphate and potassium solubilizing microbes - Isolation, characterization, mass inoculum production, field application. 8. General account of microbes used as bioinsecticides and their advantages over synthetic pesticides. Testing of commercial formulation of biopesticide containing <i>Bacillus thuringiensis</i>, <i>Pseudomonas fluorescence</i>, <i>Trichoderma viridae</i> and development of indigenous/lab based formulations.

Learning Outcomes	<ul style="list-style-type: none"> • To develop the concept of useful microorganisms in agriculture through hands on training. • To learn about isolation and production of biofertilizers and biopesticides. 	
Reading/Reference Lists	<ol style="list-style-type: none"> 1. Kannaiyan, S. (2003). Bioetchnology of Biofertilizers, CHIPS, Texas. 2. Mahendra K. Rai (2005). Hand book of Microbial biofertilizers, The Haworth Press, Inc. New York. 3. Reddy, S.M. et. al. (2002). Bioinoculants for sustainable agriculture and forestry, Scientific Publishers. 4. 4. Subba Rao N.S (1995) Soil microorganisms and plant growth Oxford and IBH publishing co. Pvt. Ltd. NewDelhi. 5. Saleem F and Shakoori AR (2012) Development of Bioinsecticide, Lap Lambert Academic Publishing GmbH KG 6. Aggarwal SK (2005) Advanced Environmental Biotechnology, APH publication. 	
Evaluation	CA:40 End sem:7 Attendance:3	
Paper Structure for Theory Semester Exam	NA	