Programme	BS Botany	Course Code	BOT-307L	Credit Hours	1
Course Title	**Plant Microbe Interactions (Lab)**				

Lab Course Contents

- Methods of sterilization of glassware and media preparation.
- Growth of bacteria, sub-culturing and identification of bacteria on morphological and biochemical basis (using available techniques).
- Microscopic observation of bacteria. Different types of staining like simple and Differential (capsule, spores, and Gram-staining).
- Microscopic study of Actinomycetes and Cyanobacteria.
- Observation of symptoms of some viral infected plant specimens.
- Observation of symptoms of some fungal infected plant specimens.
- Isolation and Staining of Mycorrhizal Fungi
- Assessment of impact of mycorrhizal fungi on plant growth and nutrient uptake in different soil conditions.
- Isolation and Culturing of Endophytic Fungi; Identification Techniques and Evaluation of Plant Growth Responses

Textbooks and Reading Material

1. Smith, S. E., & Read, D. J. (2008). *Mycorrhizal Symbiosis* (3rd ed.). Academic Press.
2. Prell, H. H., & Day, P. (2001). Plant-Fungal Pathogen Interaction: A Classical and Molecular View. Springer.
3. Vidhyasekaran, P. (2007). *Fungal Pathogenesis in Plants and Crops: Molecular Biology and Host Defense Mechanisms* (2nd ed.). CRC Press.
4. Stacey, G., & Keen, N. T. (Eds.). (1996). *Plant-Microbe Interactions* (Vol. 1). Springer.
5. Mukerji, K. G., Chamola, B. P., & Upadhyay, R. K. (Eds.). (2000). Biocontrol of Plant Diseases. CRC Press.
6. Pommerville, J. C. (2013). *Fundamentals of Microbiology* 10th Ed. Jones & Bartlett Publishers.
7. Kathleen, P. T., B. Chess (2018). *Foundations in Microbiology: Basic Principles.*10th Ed. McGraw-Hill US Higher Ed.
8. Bisen, P. S., Debnath, M., & Prasad, G. B. (2012). *Microbes: Concepts and Applications.* John Wiley & Sons.
9. Tortora, G. J., Funke, B. R., & Case, C. L. (2007). *Microbiology: An Introduction* 9th Ed. Pearson
10. Pommerville, J. C. (2004). *Alcamo's Fundamentals of Microbiology*. 7th Ed. Jones & Bartlett Publishers.
11. Ingraham, J. L., & Ingraham, C. A. (2004). *Introduction to Microbiology*: *a case history Approach.* 3rd Ed. Thomson Brokks/Cole
12. Arora, D. R. (2004). Textbook of Microbiology, CBS Publishers and Distributors, New Delhi.
13. Black, J. G. (2005) Microbiology - Principles and Exploration, John Wiley and Sons, Inc.
14. Prescott, L. M., Harley, J. P. and Klein, D. A. (2005). *Microbiology* McGraw-Hill Companies, Inc.
15. Ross F. C. (1995). *Fundamentals of Microbiology*. John Willey & Sons, New York.\

Teaching Learning Strategies

- Lectures
- Group Discussion
- Laboratory work
- Seminar/ Workshop

Assignments: Types and Number with Calendar

- Lecture Based Examination (Objective and Subjective)
- Assignments
- Class discussion
- Quiz
- Tests