

Course Code	Course Name	Credits
26BT955	BIOFERTILIZER	02

Course Description

This course provides a comprehensive understanding of biofertilizers and their role in sustainable agriculture. It covers microbial types, production technologies, application methods, and organic farming practices. The course integrates theoretical concepts with practical knowledge on plant-microbe interactions, mass production, and quality control, enabling learners to apply eco-friendly agricultural practices for soil health and crop productivity.

Course Objectives

- To introduce learners to the concept, types, and importance of biofertilizers in agriculture.
- To develop understanding of plant–microbe interactions and soil ecosystem functions.
- To explain production technologies and quality control of biofertilizers.
- To provide knowledge of application techniques and management of biofertilizers.
- To develop understanding of organic farming and biological pest control methods.

Skill Enhancement Outcomes

After completing the course, learners will be able to:

- Understand the types and significance of biofertilizers in sustainable agriculture.
- Identify key microbial biofertilizers and their functions in soil fertility.
- Apply basic principles of strain selection, sterilization, and mass production.
- Demonstrate proper application techniques for seeds, seedlings, and other planting materials.
- Understand storage, shelf life, and quality control of biofertilizers.
- Apply organic farming practices including composting and bio-waste recycling.

Course Content and Practical Training

- Introduction to biofertilizers: definition, types, and importance
- Strain selection, inoculum preparation, and mass production techniques
- Plant–microbe interaction and soil ecosystem concepts
- Bacterial biofertilizers: *Azospirillum*, *Azotobacter*, *Bacillus*, *Pseudomonas*, *Rhizobium*, *Frankia*
- Cyanobacterial biofertilizers: *Anabaena*, *Nostoc*, *Hapalosiphon*
- Fungal biofertilizers: *Arbuscular mycorrhiza* (AM) and *ectomycorrhiza*
- Production technology: sterilization, fermentation, and equipment usage
- Carrier-based and liquid biofertilizer production methods
- FCO specifications and quality control standards
- Application techniques for seeds, seedlings, tubers, and other crops
- Storage, shelf life, marketing, and factors affecting efficacy
- Organic farming practices: green manuring and organic fertilizers
- Recycling of biodegradable waste and biocompost preparation
- Vermicomposting techniques and Panchagavya preparation
- Biological pest control methods

Learning Outcome

At the end of the course, learners will be able to understand biofertilizer production and application, identify key microbial agents, and apply organic farming and soil health management practices for sustainable agricultural productivity.