

**Bajaj College of Science, Wardha (Autonomous)**  
**Department of Microbiology**  
**Certificate Course in**  
**“Biofertilizer Production”**

• **Specifications of Course:**

A) Nature	Certificate Course
B) Duration	<b>30 hrs</b>
C) No. of Credits	<b>2</b>
D) No. of seats	<b>50</b>
E) Fee Proposed	<b>500/-</b>

**I. COURSE OVERVIEW:**

This course provides an understanding of various processes involved in the production of biofertilizer. The purpose of a Certificate Course in Bio-fertilizer Preparation is to prepare students for a career in Bio-fertilizer production. This field is essential for the growth of plants, and it requires experts who are well-equipped with cutting-edge technologies, creative research ideas, and the highest ethical standards.

**II. PREREQUISITE(S): UG/PG**

**III. COURSE OBJECTIVES:**

- The objective of the course is to demonstrate the low cost media preparation
- To impart hands on training on the skills associated with Biofertilizer organisms isolation, production and application.
- To impart training of ecofriendly agricultural inputs in biofertilizer production.

**IV. COURSE OUTCOMES:**

On successful completion of the course, the learners should be able to

CO1: Describe about the importance of biofertilizers.

CO2: Identify bacterial, algal and fungal biofertilizer.

CO3: Assess the quality control of biofertilizers.

CO4: distinguish the types of biofertilizers and methods of application in field.

CO5: Development of integrated management for best results using nitrogenous and phosphate biofertilizers.

# SYLLABUS

## BIOFERTILIZER PRODUCTION

### Theory (15 Hrs)

**UNIT I:** Introduction, History and concept of Bio fertilizers, importance of Bio fertilizers. Current status, Concept of PGPR.

**UNIT II:** Bacterial bio fertilizer: Rhizobium, Azotobacter and Azospirillum. Algal biofertilizer - Blue green algae- Azolla. Fungal biofertilizers - Mycorrhizae – ecto and endomycorrhiza. Phosphate solubilizing bacteria and Fungi.

**UNIT III:** Production technology: Strain selection, sterilization, growth and fermentation, mass production of carrier based and liquid bio fertilizers. Storage, shelf life, quality control and marketing.

### PRACTICALS: (15 Hrs)

1. Hands on training on equipments used in Biofertilizer unit
2. Isolation and identification of Rhizobium from root nodules.
3. Isolation and identification of Azotobacter from soil.
4. Production of bacterial biofertilizer: Rhizobium
5. Production of bacterial biofertilizer: Azotobacter
6. Production of algal biofertilizer: Blue Green Algae

#### • Reference Books:

1. Subba Rao N.S. 1995, Soil microorganisms and plant growth, Oxford and IBH publishing Co. Pvt. Ltd, NewDelhi.
2. Mahendra K. Rai. 2005, Hand book of Microbial biofertilizers, The Haworth Press, Inc. New York.
3. Kannaiyan S. 2003, Bioetchnology of Biofertilizers, CHIPS, Texas.
4. Jamaluddin et al., 2013 Microbes and sustainable plant productivity. Scintific Publishers Jodhpur, India.

- **Mode of Teaching:**

The theory lectures and practical sessions of the course will be conducted via Blended mode i.e. Offline lectures, Pre-recorded video lectures.

- **Certificate of completion:** The students appearing for the final exam via online mode will only be eligible for the certificate of completion at the end of the course.
- **Exam Scheme:** Final exam will be of 50 Marks

**Pattern:** MCQ

**Passing Criterion:** 40 %

**Course Coordinator**

Mr. M. G. Ingale  
BCS, Wardha