**FACULTY OF AGRICULTURE**
**VALUE ADDED ELECTIVE COURSE**

**VAAG-011: Microbial Inoculant Production Technology (3+0)**

**Objective**
To study the basic principles and application methodologies of different microbial inoculants in order to improve the soil fertility and productivity.

**Unit – I: Concepts of microbial inoculants**

**Unit-II: Nitrogen fixing biofertilizer**
Characteristics and classification of *Azospirillum, Azotobacter, Gluconacetobacter.* - Actinorhizal plants (*Frankia*) and Algal biofertilizers - Blue green algae – Azolla.

**Unit –III: Phosphate solubilizing/mobilizing biofertilizer**

**Unit –IV: Formulations of biofertilizer**
Different formulations of biofertilizers – Types and characters - carrier – beads – pellets and liquid formulation – preservatives and additives-shelf life of different formulations- quality control of different formulations - BIS.

**Unit-V: Production technology**

**Theory Schedule**
1. Microbial inoculants in Agriculture.
2. Biofertilizers-definition-Development of the concept-
3. Contribution and importance of microorganisms to soil fertility.
4. Different groups of biofertilizers-bacterial,
5. Different groups of algal
6. Different groups of fungal biofertilizers etc.
7. Nitrogen fixing microorganisms-Phosphate solubilising microorganisms etc.
8. Symbiotic nitrogen fixing bacteria-Rhizobium classification-Cross inoculation groups- characteristics.
11. Transfer of fixed nitrogen in symbiotic systems.
13. Importance of Glucoacetobacter and its distribution.
15. Actinorhizal association-Frankia-Importance-location, biochemistry and physiology of actinorhizal nodules.
16. Phosphate solublization by microorganisms-bacteria and fungi involved general characters and importance.
17. Algal biofertilizers - Blue green algae-distribution-occurrence.
19. Azolla-Anabaena symbiosis-Importance- Azolla growth behavior-multiplication- sporulation etc.

20. Mid Semester Examination
21. Mycorrhiza- types -Ectomycorrhiza –
23. Role of mycorrhiza in crop production.
24. Microbial inoculants for solublization of potassium sulphur and trace elemnts.
26. Different formulations of inoculants- carrier, gel, liquid formulations etc.
27. Principles of mass production-Large scale production of bacterial biofertilizers-growth characteristics.
29. Shelf life-quality control of biofertilizers-BIS specifications.
30. Field performance of biofertilizers.
31. Method of application –Economics.
32. Algal multiplication-large scale production-application methods
33. Azolla-Mass multiplication and method of application etc.

References Books


**E reference**