ELECTIVE PAPER 2

(Ecology and Evolution)

01. Molecular Phylogenetic analysis
02. Calculate the Carbon Credit and foot print of given data
03. Study of biodiversity by Quadrant analysis
04. Construction of Winogradsky column
05. Determination of primary productivity in fresh water bodies

Skill Based Elective Paper

GE-1 Biofertilizer and Organic Framing

1. Course code and title

Course code: General Elective 1
Course title: Biofertilizer and organic farming
Course type: Skill based elective paper
Course credits: 02

Course Objectives

This course is design to give a broad outline on bio fertilizers screening, isolation, scaling up and its applications. This course will help to develop low-cost media preparation and impart training of ecofriendly agricultural inputs in bio fertilizers products and organic farming.

UNIT 1	**INTRODUCTION TO BIOFERTILIZER**
	Teaching Duration: Lectures 09
1.1	Biofertilizer for sustainable Agriculture
1.2	Economical and Environmental benefits of Biofertilizer
1.3	Development of microbial biofertilizer industry
1.4	Group of biofertilizers

UNIT 2	**MICROBIAL INOCULANTS FOR ORGANIC FARMING**
	Teaching Duration: Lectures 09
2.1	Introduction to organic farming
2.2	Bacterial inoculants
2.3	Green manuring
2.4	Cyanobacterial inoculants
2.5	Azolla as Bio fertilizer

UNIT 3	**COMPOSTING**
	Teaching Duration: Lectures 09

3.1	Importance of composting
3.2	Optimization of nutrients for agricultural compost
3.3	Methods of spreading compost
3.4	Classification of composting
3.5	Method of operating
3.6	Preparation of consortia

UNIT 4	**ECONOMIC IMPORTANCE OF BIOFERTILIZERS**
	Teaching Duration: Lectures 09
4.1	Benefits from bio fertilizers
4.2	Commercial producers of bio fertilizers
4.3	Progress of bio fertilizers in India
4.4	ECO specifications & quality control of bio fertilizers
4.5	Storage, shelf life, quality control & marketing of bio fertilizers
4.6	Benefits from organic farms

LIST OF PRACTICALS

01. Study of physico- chemical parameters of bio fertilizer
02. Isolation of mycorrhizia
03. Isolation of potassium and phosphate solubilizing microbes
04. Preparation of consortia to enrich organic farm soil

* A visit to a biofertilizer production unit

4. Course Learning Outcomes/ Student's Learning Outcomes (SLO)

Unit 1: Students shall gain an understanding of biofertilizers and its importance. They shall develop the skill of establishing a biofertilizer unit.

Unit 2: Students shall gain an insight of microbial inoculants and methods of application in organic farms and fields.

Unit 3: Students shall be enabled to prepare a compost from agricultural waste and its use.

Unit 4: Students shall learn about the commercial units for the production of biofertilizers and methods of application It helps in development of integrated management for best results using nitrogenous and phosphate bio fertilizers.

Recommended learning resources

- Dubey, R. C. (1993). A Textbook of Biotechnology. (5 th Edition) S. Chand Publishing. (ISBN: 978-8121926089)
- Dubey, R. C. (2000). Textbook of Microbiology. (4 TH Edition) S. Chand, Limited. (ISBN: 978-8121926201)
- Motsara, M. R., Bhattacharyya, P., & Srivastava, B. (1995). Biofertilizer: Technology, marketing and usage. A sourcebook-cum-glossary.
- Purohit, S. S. (2001). Microbiology: Fundamentals and Applications. Agrobios. (ISBN: 9788177540246)

- Somasundaram, E., Nandhini, D. U., & Meyyappan, M. (2019). Principles of Organic Farming: (With Theory and Practicals). New India Publishing Agency. (ISBN:9781003260844)
- Subba Rao, N. S. (1993). Biofertilizers in agriculture and forestry (3rd rev. ed). International Science Publisher. (ISBN: 1881570290)

Skill Based elective paper

GE-2 Yogurt and Cheese production

1. Course Code & Title

Course code: General Elective 1
Course title: Yogurt and cheese production
Course type: Skill based elective paper
Course credits: 02

2. Course Overview and Course Objectives

After successful completion of course student will be able to know the whole process of cheese and yogurt production and get an idea about the basic process of setting up a small-scale business for the same.

Course Objectives

- To learn details of how to do marketing and product development in dairy industry
- To design setup of industry location, building, equipment etc.
- To learn processing of cheese and yogurt production and other parameters like quality assurance and legislation.
- To understand planning, managing and taking advantage of various government schemes for establishment of medium and small medium scale cheese/yogurt making industry.

3. Course Content

UNIT 1	MARKETS FOR DAIRY PRODUCTS
	Teaching Duration: Lectures 09
1.1	Introduction
1.2	Types of Market
1.3	Overview of Customer Care Concepts
1.4	The Need for A Feasibility Study
1.5	Developing a Marketing & Selling Strategy
1.6	Product Development
1.7	Competitors

UNIT 2	SETTING UP PRODCUTION
	Teaching Duration: Lectures 09
2.1	Selecting the location