Darrang College (Autonomous), Tezpur- 78404

Syllabus for FYUGP Botany (SEC)

Approved by :

Board of Studies meeting held on 30th July, 2025

&

Academic Council vide Resolution no. 04, dated- 12/08/2025

PG DEPARTMENT OF BOTANY
DARRANG COLLEGE , TEZPUR (AUTONOMOUS)
FYUGP 1st SEMESTER SKILL ENHANCEMENT COURSE

PAPER NAME : MUSHROOM CULTIVATION TECHNOLOGY
PAPER CODE : BOT-SEC-01013

Credits: 3

Learning objectives:

- Understand the basics of mushroom by enabling students to identify edible and poisonous mushrooms
- Develop interest in mushroom cultivation
- Provide hands on training for the preparation of spawn and mushroom bed for mushroom cultivation
- Learn various post-harvest technology associated to mushroom cultivation . Identify and manage Insect-Pests affecting mushroom
- Help the students to learn a means of self-employment and income generation

Learning outcomes:

On successful completion of the course, students will be able to :

- Identify edible and poisonous mushrooms
- Gain the knowledge of cultivation of edible mushrooms and spawn production; and various postharvest technology associated to mushroom cultivation
- Manage various diseases and pests of mushrooms
- Learn the way of self-employment and income generation

THEORY

Unit 1: Introduction to mushrooms Mushrooms - taxonomic rank. Different parts of typical mushroom; structure and texture of fruitbodies - Gilled fungi and pore fungi; Life cycle of mushrooms; various habitats of mushrooms - Lignicolous, Humicolous and Coprophilous; Symbiotic associations - Mycorrhiza.

Unit 2: Cultivation of Mushrooms History, scope, and opportunities of mushroom cultivation. Problem in cultivation - diseases, pests, and nematodes and their management strategies.

Unit 3: Health benefits of mushrooms Historical uses of mushrooms; Nutrient profile of mushrooms - Amino acids, Protein, Carbohydrates, fats, minerals, and vitamins; Therapeutic aspects - antioxidant, antimicrobial, antidiabetic, anticancer effect; stimulating vitamin D production in mushrooms.

Unit 4: Common edible and poisonous mushrooms

Edible Mushrooms - Oyster mushroom (Pleurotus ostreatus), paddy straw mushroom (Volvariella volvcea), Button mushroom (Agaricus bisporus); Poisonous mushroom – False parasol or green-spored parasol (Chlorophyllum molybdites).

Unit 5: Principles of mushroom cultivation Structure and construction of mushroom house; Spawn production - culture media preparation, isolation of pure culture, mother spawn, multiplication of spawn; Sterilization of substrates. Composting techniques, mushroom bed preparation; Spawning, spawn running, harvesting. Cultivation of oyster mushroom.

Unit 6: Post harvest technology Preservation of mushrooms - freezing, drying, and packaging, quality assurance, shelf life, market opportunities. Value added products of mushrooms.

PRACTICAL

1. Preparation of media for mushroom culture

2. Preparation of pure culture

3. Production of spawn

4. Cultivation of oyster mushroom using paddy straw/lignocellulosic wastes. (All the students should do in groups)

Suggested Readings

1. Purkayastha RP, Chandra A (1985) Manual of Indian edible Mushrooms. Today and Tomorrows Printers and Publishers, New Delhi.

2. Pathak VN, Yadav N (1998) Mushroom Production and Processing Technology. Agrobios, Jodhpur.

3. Tripathi DP (2005) Mushroom Cultivation. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

4. Pandey RK, Ghosh SK (1996) A Hand Book on Mushroom Cultivation. Emkey Publications.

5. Hait G (2023) Introductory Botany (Biofertilizer and Organic Farming, Herbal technology, Mushroom Culture Technology). Vol - I, Global Net Publication, New Delhi.

6. Pathak VN, Yadav N, Gaur M (2000) Mushroom Production and Processing Technology. Vedams Ebooks Pvt. Ltd., New Delhi.

(FYUGP) SKILL ENHANCEMENT COURSES

BOTANY 2ND SEMESTER

BIOFERTILIZER
Paper Code: BOT-SEC-02013

PAPER CODE	NAME OF THE PAPER	CREDIT	EVALUATION
SEC 0201303	BIOFERTILIZERS	3	40 - 60

Unit 1 : Fertilizers and types of fertilizers- organic, inorganic, and biofertilizers. General account of biofertilizer- different types, benefits. – *Rhizobium*, Actinorrhizal symbiosis . **(4 lectures)**

Unit 2 : *Azospirillum* : isolation and mass multiplication. *Azotobacter* – crop response to Azotobacter inoculum. **(4 lectures)**

Unit 3 : Cyanobacteria (blue green algae), *Azolla* and *Anabaena azollae* association, benefits of field application. **(4 lectures)**

Unit 4 : Mycorrhizal association , types of mycorrhizal association , colonization of VAM and its influence on growth and yield of crop plants. **(5 lectures)**

Unit 5 : Organic farming – Green manuring and organic fertilizers. Biocompost making methods, types and method of vermicomposting – field application, methods and benefits **(5 lectures)**

Suggested readings

1. Dubey, R.C.,2005 A text book of biotechnology S.Chand & Co, New Delhi
2. Kumaresan, V.2005, Biotechnology, Saras Publications, New Delhi
3. John Jothi Prakash, E. 2004. Outlines of Plant Biotechnology. Emkay Publication, New Delhi
4. Sathe, T.V. 2004 Vermicult+ure and Organic Farming. Daya publishers
5. Subha Rao, N.S.2000, Soil Microbiology, Oxford & IBH Publishers, New Delhi
6. Vayas, S.C, Vayas, S. and Modi, H.A. 1998 Bio-fertilizers and organic Farming Akta Prakashan, Nadiad

PRACTICAL

1. To study the process of Vermicompost
2. Estimation of solid waste generated by a domestic system (biodegradable and non- biodegradable) and its impact on land degradation
3. Mycorrhizal association-pictures