FIFTH SEMESTER DEGREE PROGRAMME

## GEC IN BOTANY-1- 5D01BOT - MUSHROOM CULTIVATION

**Module 1. Mycology. 5hrs**

Five kingdom classification of organisms. Kingdom fungi. General characters of form, function, reproduction and relationship with other organisms. Importance of fungi in human welfare.

**Module 2. Mushroom Biology 10hrs**

Morphology (range of form, macro-morphology, micro-morphology), life cycle of a typical mushroom and biological function. Edible, non-edible and poisonous species. Domestication of mushroom. Importance of mushroom in human nutrition, sustainable livelihood, ecosystem function and quality of the environment.

**Module 3, Applied Mushroom Biology.12 hrs**

Mushroom cultivation and production. Lab scale, pilot plant and large scale cultivation of commercial species. Crop cycle- spawn, substrate, substrate processing, spawning, spawn run, cropping, harvesting, environment requirement, post harvest practices, shelf life, preservation, storage, transport and marketing. Value-added products of mushroom. Constraints and environment management. Economics of mushroom cultivation. Designs of mushroom facility.

Economics of mushroom cultivation and marketing.

**Module 4. Mushroom Biotechnology**. **9 hrs**

Concept. Preparation of flavours, appetizers, neutraceuticals, dietary supplements and cosmetics. Mushroom bioremediation. Cleaning of polluted sites .Utilization of mushroom mycelium or enzymes in recycling biological materials. Mycofiltration and applications of the process. Mycorrhiza applications. Biopulping, biobleaching and biotransformations. Biodetergents.

**References.**

1. Harandar Singh 1991. Mushrooms: the art of Cultivation. Sterling Publishers.
2. Kaul, T.N.2001. Biology and conservation of Mushrooms. Oxford and IBH Publishing Company.
3.Tripathi, M. Mushroom Cultivation. Oxford and IBH Publishing Company.
4. Suman B.C.and Sharma V P.2007. Mushroom Cultivation in India. Eastern Book Corporation.
R.Singh and U.C.Singh 2205. Modern Mushroom Cultivation. Agrobios.

**WEIGHTAGE OF MODEL QUESTION PAPER: 5D01BOT: MUSHROOM CULTIVATION**

| Unit | Marks |
|---|---|
| Module 1 | 4 |
| Module 2 | 8 |
| Module 3 | 12 |
| Module 4 | 6 |

| **Difficulty level** | Easy | Average | Difficult |
|---|---|---|---|
| **Weightage of Marks** | 10 | 15 | 5 |
| **Creation level and related verbs** | **Knowledge**<br>Define, Describe, Explain, Illustrate, Enumerate, List, Label, Select, etc | **Understanding**<br>Summarise, Classify, Compare, Contrast, Infer, Relate, Discuss, Distinguish, etc | **Application and higher levels**<br>Solve, Comment, Criticize, Modify, Plan, Design, Revise, Differentiate, Demonstrate, etc |

**KANNUR UNIVERSITY FIFTH SEMESTER DEGREE EXAMINATION**
**5D01BOT: MUSHROOM CULTIVATION**

TIME: 2Hrs MAXIMUM MARKS : 20

Draw diagrams wherever specified

MODEL QUESTION PAPER WILL BE ADDED LATER.

FIFTH SEMESTER DEGREE PROGRAMME

**GEC IN BOTANY--2: 5D02BOT -BOTANY FOR THE BEGINNERS**

**Module -1: Living World 10 hrs**.

Concept of Living and Non Living: Viruses, Bacteria, Fungi, Plants and Animals; Five kingdom Classification- Classification of plants- Eichler's system – general characters of groups- An introduction to the Life cycle of plants.

Cell Structure-Prokaryote and eukaryote

**Module - 2: Morphology of Angiosperms 8 hrs**

Typical angiosperm plant: Functions of each organ viz. Root, Stem, leaves, inflorescence, flowers, fruit and seed.

Flower: Basic structure - essential and non essential whorls.

**Module - 3: Origin and Evolution of Life 8 hrs**

Definition, Ancient Concepts and Modern Concepts. Origin of Life – Geological Time scale – Variation in Hydrosphere, Lithosphere, Atmosphere and Biosphere from Pre Cambrian to Coenozoic era. Darwin's Natural Selection theory and Modern evidences at molecular and organismic level in support of Darwin's theroy

**Module- 4: Interaction between plants and animals 10 hrs**

General concept on Interaction between plants, microbes and animals.

Ecological Significance of Plants – Solar energy fixing Producers, Nitrogen fixation, biofertilisers, biopesticides,

Symbiotic relationships-Mutualism, Commensalism, Protoco-operation, Parasitism.

Plants and Animals for pollination and seed/fruit dispersal-

Pollination- Entomophily, Chiropterophily, Myrmecophily

Seed Dispersal: Zoochory,

Specific case studies on examples for co evolution- Dodo and Calvaria, Butterflies and plants; Wasps and Ficus, mimicking for pollinators.

Medicinal uses of plants – traditional knowledge and scientific knowledge – a brief account

**References.**


1. Agarwal, S. K. (2009), Foundation Course in Biology, Ane Books Pvt. Ltd., New Delhi.
2. Datta, A C Class book of Botany
3. Mamatha Rao, Microbes and Non flowering plants-impacts and applications, Ane Books, Pvt Ltd, New Delhi.
4. Pandey, B. P. 2001.College Botany, Vol. I: Algae, Fungi, Lichens, Bacteria, Viruses, Plant Pathology, Industrial Microbiology and Bryophyta. S. Chand & Company Ltd, New Delhi.
5. Prithipal Singh (2007), An introduction to Biodiversity- Ane Books India, New Delhi
6. Raven, P.H; Johnson, G.B; Losos, J.B; Singer, S.R (2005), Biology, seventh edition, Tata McGraw-Hill, New Delhi
7. Robert A Wallace. Biology, The world of life. Harper Collins Publishers

**WEIGHTAGE OF MODEL QUESTION PAPER: 5D02BOT: BOTANY FOR THE BEGINNERS**

| Unit | Marks |
|---|---|
| Module 1 | 8 |
| Module 2 | 7 |
| Module 3 | 6 |
| Module 4 | 9 |

| **Difficulty level** | Easy | Average | Difficult |
|---|---|---|---|
| **Weightage of Marks** | 10 | 15 | 5 |
| **Creation level and related verbs** | **Knowledge** Define, Describe, Explain, Illustrate, Enumerate, List, Label, Select, etc | **Understanding** Summarise, Classify, Compare, Contrast, Infer, Relate, Discuss, Distinguish, etc | **Application and higher levels** Solve, Comment, Criticize, Modify, Plan, Design, Revise, Differentiate, Demonstrate, etc |

**KANNUR UNIVERSITY FIFTH SEMESTER DEGREE EXAMINATION**
**5D02BOT: BOTANY FOR THE BEGINNERS**

TIME: 2Hrs MAXIMUM MARKS : 20

Draw diagrams wherever specified

MODEL QUESTION PAPER WILL BE ADDED LATER.