Programme	BS Botany	Course Code	Bot-203	Credit Hours	2
Course Title	**Mycology (Theory)**				

Introduction

The course is organized to provide an adequate knowledge about different fungal groups with their representatives along with their Taxonomy, Morphology, Anatomy and life cycle patterns. It is generally aimed to familiarize students with the morphological and systematic knowledge of different fungi, their structure and Economic importance

Learning Outcomes

By the end of this course, students will be able to:

- Evaluate the taxonomy, morphology, and physiology of fungi and their roles in various ecosystems.
- Identify and understand various fungal groups.
- Apply mycological techniques to identify fungal species and assess their ecological and economic impacts.

Course Contents

1. **General introduction to fungi**
   - Cells, hyphae and tissues
   - Economic importance
   - Classification-principles of Fungal taxonomy
   - Nomenclature and kingdom systems

2. **Kingdom Straminopila:**
   - Importance, morphology, taxonomy and nomenclature of Hyphochytridiomycota, Labyrinthulomycota and Oomycota
   - Oomycota: Importance and life cycles of fungal spores in Saprolegniales (*Saprolegnia, Achlya*), Peronosporales (Downy Mildews and *Albugo*), Sclerosporales (*Sclerospora*) and Pythiales (*Pythium, Phytophthora*)
3. **Kingdom Fungi:**
   - General characters and importance
   - Chytridiomycota: General Characteristics, classification, importance and life cycle (*Synchytrium* and *Olpidium* spp.)
4. **Zygomycota:**
   - General characters, various types of asexual reproductive structures; Zygosporogenesis
   - Role of hormones in sexual reproduction
   - Heterothallism
   - Characteristics and life cycle of important genera of Mucorales (*Mucor, Pilobolus)*, Endogonales and Entomophthorales (*Entomophthora*)
   - Arbuscular mycorrhiza.
5. **Ascomycota:**
   - Morphology, reproduction, life cycle patterns, sexual compatibility and parasexuality
   - Types of asci, centra and ascocarps
   - Ascosporogenesis and conidiogenesis
   - Concept of anamorphs and telomorphs
   - Classes of conidial fungi: Hemiascomycetes; general characters of orders: Endomycetales (yeasts), Taphrinales (*Taphrina*).
   - Plectomycetes, Pyrenomycetes; general characters of orders Erysiphales (Powdery mildew), Xylariales, Clavicipitales (Ergots)
   - Discomycetes: general characters of orders Pezizales and Helotiales

- Loculoascomycetes; general characters of Pleosporales
- Ascolichens, general characters, anatomy and distribution in Pakistan.

6. **Basidiomycota:**
    - Introduction to Basidiomycetes: Somatic structure, reproduction, basidiocarp developmental patterns, types of basidia and basidiospores
    - Life cycle patterns.
    - Homobasidiomycetes
    - Heterobasidiomycetes
    - Urediniomycetes
    - Ustilaginomycetes
    - Gasteromycetes; their placement in different clades, general characteristics and spore dispersal
7. **Mycorrhizae:** Ectotrophic mycorrhizae and their role in forest ecosystem
8. Introduction to molecular techniques and their application in Mycology