DEPARTMENT OF BOTANY
SEMESTER - IV
Category-I
BSC (Hons.) BOTANY

DISCIPLINE SPECIFIC CORE COURSE - 10: Mycology

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
MYCOLOGY **DSC-10**	4	**2**	**0**	**2**	Class XII pass with Biology/ Biotechnology	Nil

Learning Objectives:

- To introduce students with various fungal groups and lichens, their ecology, classification, characteristics, reproduction and economic Importance
- To introduce students to the role of fungi in biotechnology, food industry, agriculture, human health and diseases etc.

Learning Outcomes: Upon completion of this course, the students will be able to:

- understand the world of fungi, lichens and pathogens of plants
- understand characteristics the ecological and economic significance of the fungi and lichens
- understand the application of mycology in various fields of economic and ecological significance

Unit 1: Introduction **04 hours**

General characteristics; Thallus organization; Cell wall composition; Nutrition; Heterokaryosis and Parasexuality; Classification - Webster and Weber (2007) and Introduction to Phylogenetic system of classification.

Unit 2: Chytridiomycota **01 hour**

General characteristics; Life cycle of *Synchytrium*, *Allomyces*

Unit 3: Zygomycota **02 hours**

General characteristics; Distribution; Thallus organization; Classification; Life cycle of *Rhizopus &Mucor*.

Unit 4: Ascomycota **05 hours**

General characteristics; Distribution; Classification, Life cycles of *Saccharomyces, Penicillium, Alternaria, Neurospora* and *Peziza.*

Unit 5: Basidiomycota **05 hours**
General characteristics; Distribution; Classification, Life cycle of *Puccinia graministritici*, *Agaricus*; Bioluminescence, Fairy Rings, Mushroom cultivation.

Unit 6: Oomycota **02 hours**
General characteristic (with emphasis on difference with fungi); Distribution; Classification, Life cycle of *Albugo*.

Unit 7: Myxomycota **02 hours**
General characterises (with emphasis on difference with fungi); Distribution; Types of plasmodia; Types of fruiting bodies; Life cycle of *Stemonitis*.

Unit 8: Symbiotic associations **04 hours**
Lichen - Distribution; General characteristics; Growth forms and range of thalli; Economic importance of lichens. Mycorrhiza - Ectomycorrhiza, Endomycorrhiza and their significance.

Unit 9: Applied Mycology **05 hours**
Application of fungi in Food Industry- Fermentation, Organic acids, Enzymes, Mycoproteins; Introduction to Plant Pathology**,** Nematophagous fungi, Entomogenousfungi , Mycoparasites, Mycoremediation, Medical mycology and Mycotoxins.

Practicals **60 hours**

1. *Rhizopus* & *Mucor*: Study of asexual stage from temporary mounts and sexual stage through permanent slides.
2. *Saccharomyces:* Study of vegetative cell and buddingfrom temporary mounts.
3. *Penicillium*: Study of asexual stage from temporary mounts and sexual stage from permanent slides.
4. *Peziza*: Study of sexual stage from temporary preparation of V.S of ascocarp.
5. *Alternaria solani*: Study of symptoms of early blight of Potato. Study of asexual stages through temporary mounts.
6. *Puccinia graminitritici*: Herbarium specimens of Black stem rust of wheat and barberry leaves; sections / mounts of spores (Uredospores and Teleutospores) on wheat. Permanent slides showing spore stages on both the hosts.
7. *Agaricus:* Specimens of button stage and mature basidiocarp; V.S of gills of *Agaricus*.
8. Study of Phaneroplasmodium of *Physarum* and sporangia of *Stemonitis.*
9. *Albugo candida*: Study of symptoms of white rust on *Brassica* sp.; Asexual stage study through section / temporary mounts. Sexual structures through temporary mounts / permanent slides.
10. Lichens: Study of different types of lichens - Crustose, Foliose and Fruticose. Study of Internal structure of thallus; Apothecium through permanent slides.

Suggested Readings:

1. Agrios, George N. (2005). Plant Pathology, 5th Edition, Academic Press / Elsevier.
2. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, 4th edition, John Wiley & Sons, Singapore.
3. Moore, David et. al. (2020). 21st Century Guidebook to Fungi, 2nd Edition, Cambridge University Press.
4. Sethi, I.K. and Walia, S.K. (2018). Text book of Fungi and Their Allies, Medtech Publishers.
5. Webster, J., Weber, R. (2007). Introduction to Fungi, 3rd edition. Cambridge, U.K.: Cambridge University Press, UK.

Additional Resources:

1. Kavanagh, Kevin (2017). Fungi: Biology and Applications, 3rd Edition, Wiley-Blackwell.
2. Maheshwari, Ramesh (2012). Fungi: Experimental Methods in Biology, 2nd Edition, CRC Press.
3. Ownley, Bonnie and Trigiano, Robert N. (2017). Plant Pathology: Concepts and Laboratory Exercises, 3rd Edition, CRC Press.
4. Watkinson, Sarah et. al. (2015). The Fungi, 3rd Edition, Academic Press / Elsevier.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.