

Programme: M. Sc. (Botany)

Course Code: BOO-506

Title of the Course: Lab in Fungal Biodiversity, Bioprospecting and Biotechnology.

Number of Credits: 1 (24 hrs session)

Effective from AY: 2020-21

Prerequisites for the course:	Knowledge of fungi and fungal biotechnology at UG Level.	
Objective:	To introduce students to practical knowledge and hands on training in various areas of fungal biodiversity surveys, systematic chemical screening of important strains and impart technical knowledge in fungal bioprospecting and biotechnology to make them skilled in biotechnology based industries in general and those using fungi in particular	
Content:	<ol style="list-style-type: none">1. Using fungal databases e.g. indexfungorum.org2. Introduction to Fungal biodiversity inventorying methods.3. Constructing fungal phylogenetic tree.4. Production of fungal pellets in submerged culture.5. Studying Morphology of fungal pellets.6. Screening <i>Aspergillus</i> strains for organic acid production.7. Testing fungal cultures for Phosphate solubilization assay using Pikovskaya medium.8. Screening yeasts for sugar fermentation capacity.9. Extraction and UV-Visible spectral detection of pigments from fungi.10. Study of fungal melanins.11. Fungal enzyme assays using chromogenic methods.12. Producing and testing immobilized fungal biomass.13. Immobilization of fungal enzymes.14. Studying fermentation of grape juice with wine yeast.15. Production of mushroom spawn and assessment of its quality.16. Quality parameters of marketed mushrooms.17. Testing action of fungicides on fungal cultures.18. Testing Dough raising power of Bakers' yeast.19. Tests to detect fungal siderophores.20. Study of Nickel uptake by fungal cultures.	All two hour sessions, any 2 sessions of two hours each from 1-3, any 4 from 4 to 10, any 5 sessions from 11-18 and any 1 from 19 and 20
Pedagogy:	Practical exercises/ field and lab//demos/hands on exercises/ video tutorials/ software tools/mini projects/seminars/industrial study visits	

References/Readings	<ol style="list-style-type: none"> 1. Satyanarayana T. and Johri B.N. (2005). Microbial diversity, Current Perspectives and Potential Applications, IK international. 2. Gregory Michael Mueller, Gerald F. Bills and Mercedes S. Foster (2004). Biodiversity of fungi: inventory and monitoring methods, Academic Press. 3. Arora Dilip K. (2004). Fungal biotechnology in agricultural, food, and environmental applications, CRC Press. 4. Jan S. Tkacz and Lene Lange (2004). Advances in fungal biotechnology for Industry, Agriculture, and Medicine, Springer. 5. Alan T.Bull (2004). Microbial Diversity and Bioprospecting, ASM Press. 6. Robson, G. D., Pieter van West and Geoffrey Gadd (Eds.) (2007). Exploitation of Fungi (British Mycological Society Symposia), CUP, 350 pp. 	
<u>Learning Outcomes</u>	<ul style="list-style-type: none"> • Enable the students to adopt necessary skills required for preparing fungal biodiversity inventories • Enable the students to get employment in biotechnology industries based on fungi • Students would be able to independently do high throughput screening of industrial strains of fungi 	