



M. C. E. Society's

Abeda Inamdar Senior College

Of Arts, Science and Commerce, Camp, Pune-1

(Autonomous) Affiliated to Savitribai Phule Pune University

NAAC accredited 'A' Grade

T.Y.B.Sc. Botany

Semester V

(NEP – 2023 Pattern)

Course Title	Applied Mycology		
Course Code: 23SBBO51MN		No. of Credits: 02	
Course Type: Minor (MN)		Total Teaching Hours: 30	

Aims & Objectives of the Course

Sr.No.	Objectives
1.	To study and understand fungi, their biology, ecology, taxonomy and applications.
2.	Building a foundation for careers in research, agriculture, medicine, industry-related fields involving fungi.
3.	To study the cultivation of industrially important fungi.

Expected Course Specific Learning Outcome

Sr.No.	Learning Outcome
1.	The student will learn to identify and classify fungi.
2.	The students will correlate presence of fungi with disease states.
3.	The students will learn and recognize the uses of fungi in industries.
4.	Students will develop the ability to diagnose fungal diseases and propose solutions for their control.

Syllabus

Unit No.	Title with Contents	No. of Lectures
	Applied Mycology	
I	Introduction to Mycology – General characters of fungi, Habit and habitats, thallus organization, cell wall composition; mode of nutrition in fungi. Asexual and sexual reproduction in fungi.	04
II	General classification of Fungi according to Alexopoulos up to classes.	04
III	Economically and Industrially important fungi and its applications in Food, Biocontrol, Medicine, industry, Bioremediation etc.	02
IV	General account, habit and habitat, structure and methods of reproduction in Ascomycotina with reference to life cycle of <i>Saccharomyces</i> .	04
V	General account, habit and habitat, structure and methods of reproduction in Basidiomycotina with reference to life cycle of <i>Puccinia</i> .	04
VI	Fungi symbiotic associations with Lichens, Mycorrhizal applications in agriculture, colonization of VAM - Vesicular Arbuscular Fungal Bio-fertilizers with examples	03
VII	Role of Fungi as Bio-control (Mycofungicides, Mycoherbicides, Mycoinsecticides, Myconematicides)	02
VIII	Fungi as plant parasites as Wilts, Leaf spots, Root rots, Smuts and Rusts.	03
IX	Fungi as food: Mushrooms: Types of mushrooms, biology and growth of mushrooms, Nutritional and medicinal value of edible mushrooms; Fungi as proteins Single cell protein with reference to Yeast, commercial application and production of SCP.	04

Suggested Readings	
1.	Ainsworth, G. C. and Sussman, A. S., <i>The fungi</i> , Academic Press, New York. 1968
2.	Alexopoulos C. J , Mims C.W. and Blacwel M.I 1996, <i>Introductory Mycology</i> . John Wiley and Sons Inc.
3.	Alexopoulos, C. J. and Mims, C. W. and Blackwell, M. 1996, <i>Introductory Mycology</i> , Wiley Eastern limited, New Delhi.
4.	Burnett, J. H. 1976. <i>Fundamentals of Mycology</i> , Edw and Arnold, London.
5.	Das, Datta and Gangulee- <i>College Botany Vol. I</i>
6.	Sharma, P.D.- <i>The Fungi</i>
7.	Vashishta B.R. et al., <i>Botany for degree students- Fungi</i>



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Semester V

(NEP – 2023 Pattern)

Course Title	Practical on Mycology	
Course Code: 23SBB052MN		No. of Credits: 02
Course Type: Minor (MN)		Total Teaching Hours: 30

Aims & Objectives of the Course

Sr.No.	Objectives
1.	To learn classification, diversity of fungi and their nutritional requirements.
2.	To learn the beneficial application of fungi in industries, agriculture and medicine.
3.	To understand the beneficial fungal interactions.
4.	To learn the life cycle and ecology of some important genera of fungi and their pathogenicity.

Expected Course Specific Learning Outcome

Sr.No.	Learning Outcome
1.	The students would be able to understand the diverse nature of Fungi and their interaction with other organisms.
2.	Students will learn the vast fungal diversity in nature and method of their identification.
3.	Students will know the life cycle of commonly occurring fungal genera and the disease caused by them.
4.	Students will have knowledge on the types of fungal associations and their importance
5.	Student will understand the causes and conditions for commonly occurring plant diseases and the methods of their control.

Syllabus

Expt. No.	Title with Contents	No. of Practical
1	Study of Fungi respect to systematic position, thallus structure and reproduction of <i>Rhizopus</i> , <i>Aspergillus</i> , <i>Saccharomyces</i> , <i>Penicillium</i> , <i>Puccinia</i> and <i>Cercospora</i> .	02
2	Study of life cycle of <i>Albugo</i> w.r.t. host, occurrence, morphology and reproduction.	01
3	Study of life cycle of <i>Puccinia graminis</i> w.r.t. host, occurrence, morphology and reproduction.	02
4	Production of Citric acid by <i>Aspergillus</i> .	01
5	Estimation of Citric acid by titration method.	01
6	Study of fermentative production of Ethanol.	01
7	Study of Mycorrhizae, arbuscular mycorrhizal colonization in plant roots	01
8	Study of Association fungi in Lichen	01
9	Study of Mycofungicides - Mycorrhizal fungi to control soil borne pathogens- <i>Trichoderma</i> to control soil borne pathogens.	01
10	Study of fungal industrial metabolites/ antibiotics with their importance	01
11	Study of Bio-deterioration by fungi w.r.t. Stored Plant Food Material, Leather, Paper and Other Cellulosic Materials, Plastics, Cosmetics and Pharmaceutical Products.	02

Suggested Readings	
1 .	Mehrotra, R. S. (2011). <i>Plant Pathology</i> . Tata Mc Graw-Hill Publishing Company Limited, New Delhi
2 .	Mishra B. K. (2018) <i>Microbiology and Phycology</i> , Kalyani Publishers, New Delhi.
3 .	Pelczar, M.J., Chan, E.C.S., Krieg, N.R. (2011) <i>Microbiology</i> , 8 th edition, Tata McGraw-Hill Co, New Delhi.
4 .	Singh, V., Pandey, P.C., and Jain, D.K. (2017). <i>Microbiology and Phycology</i> , Rastogi Publication, Meerut.
5 .	Sharma, P. D. (2017). <i>Mycology and Phytopathology</i> , Rastogi Publication, Meerut



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Semester V

Course Title	PRACTICAL ON PLANT ECOLOGY		
Course Code: 23SBO51VS		No. of Credits: 02	
Course Type: VSC		Total Teaching Hours: 30	

Aims & Objectives of the Course

Sr. No.	Objectives
1.	The paper deals with general principles of Plant Ecology
2.	To understand Plant ecology in daily life.
3.	Students can recall details information about the Ecological adaptation in Plants.
4.	Students can make their observations, collect data, and analyze quadrant studies.
5.	To create foundation for further studies and the impact of climate on plants
6.	To Identify ecological variables in plants

Expected Course Specific Learning Outcome

Sr. No.	Learning Outcome
1.	To understand patterns of individual, species and populations.
2.	Understand the diversity of plants in the ecosystem
3.	Understanding basic concepts and recent trends in plant ecology
4.	Understand the application of plant resources.
5.	To become Knowledge and Skill resource persons in Ecological studies..

SYLLABUS

Expt. No.	Title with Contents	No. of Practical
	PRACTICAL S ON PLANT ECOLOGY	
01	Study of ecological instruments, Soil thermometer, minimum and maximum thermometer, Hygrometer, Cup anemometer, luxmeter, rain gauge.	01
02	Study of Ecological Anatomy of Hydrophytes: Hydrilla stem, Nymphaea petiole, Eichhornia offset	01
03	Study of Ecological Anatomy of Xerophytes: Nerium leaf, Opuntia phylloclade	01
04	Study of Ecological Anatomy of Halophytes: Avicennia leaf and pneumatophore/ Sueda leaf	01
05	Study of Ecological Anatomy of Mesophytes: Vinca leaf	01
06	Vegetation study by list count method the community by determining: a) Frequency b) Abundance c) Density	01
07	To study soil samples collected from varied habitats and analysis water holding capacity and pH of soil.	01
08	To calculate the amount of total solid, suspended solid and dissolved solid particles from different water samples	01
09	To study the distribution of different tree species in the forests.	01
10	Preparation of a map of India showing biogeographical zones.	01
11	Study on effects of effluents/contaminants on plant growth.	01
12	Study of similarity between plant communities using index of similarity and dissimilarity	01
13	Field visit to study ecological distribution of Plants.	02

Suggested Readings	
1.	Riely, J.O. and Page, S. (1990). Ecology of Plant Communities. Halsted Press, New York.
2.	Robert, L.M. (1992). Elements of Ecology. Harper Collins Publishers Inc. New York.
3.	Begon, M. 1990. Ecology: Individuals, Populations and Communities, 2nd ed. Blackwell Scientific, Cambridge, MA
4.	A text Book On Environmental Biology, Imtiyaz Hussain Zaheed, 2013, Discovery Publishing House Pvt. LTD, New Delhi, India.
5.	Ecology Syeed Eliya



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T.Y.B.Sc. Botany Semester VI

Course Title	MEDICINAL BOTANY	
Course Code: 23SBBO61MN		No. of Credits: 02
Course Type: Minor		Total Teaching Hours: 30

Aims & Objectives of the Course

Sr. No.	Objectives
1	The paper deals with general principles of Medicinal Plants.
2	To understand Plant Medicinal in daily life.
3	Students can recall details information about the Medicinal botany.
4	Students can make their observations, collect data and analyze medicinal plant studies.
5	To create foundation for further studies and the impact of climate on medical plants
6	To understand conservation of endangered and endemic medicinal plants.

Expected Course Specific Learning Outcome

Sr. No.	Learning Outcome
1.	To understand Indigenous Medicinal Sciences.
2.	Understand In-situ and Ex-situ Conservation of Medicinal Plants.
3.	To know basic concepts and recent trends in plant based medicine.
4.	To understand the Propagation of Medicinal Plants.
5.	To become Knowledge and Skill resource persons in Medicinal Botany.
6.	To get exposure to Medicinal botany study and learn to apply it in day to day life.

SYLLABUS

Unit	Title with Contents	No of Lectures
	MEDICINAL BOTANY	
I	Introduction to medicinal plants: Definition, concept, scope, Importance and objectives of medicinal plants.	02
II	History of Indian medicinal system –Siddha, Ayurveda and Unani systems.	03
III	Siddha: Origin of Siddha medicinal systems, Basis of Siddha system, plants used in Siddha medicine.	02
IV	Principles and Concepts of Ayurveda. Methods of preparation of Ayurvedic medicines.	02
V	Chemical constituents, Ayurvedic properties of aromatic plants with special reference to the following: Lemon grass, Mint, <i>Lavender</i> , <i>Eucalyptus</i> , Clove. Merits and demerits of Ayurvedic medicine.	04
VI	Propagation of Medicinal Plants: Objectives of the nursery, important components of a nursery, sowing, pricking, propagation through cuttings, layering, grafting and budding.	03
VII	i. Principles and Concepts of Unani systems of medicine. ii. Introduction to different dosage forms and method of preparations of Unani medicines. iii. Merits and demerits of Unani system.	03
VIII	Introduction to Naturopathy: Definition, concept, Scope and Importance of Naturopathy.	02
IX	Conservation of endangered and endemic medicinal plants: Definition: endemic and endangered medicinal plants, Ex situ conservation: Botanic Gardens, Ethnomedicinal plant Gardens.	04
X	Monographs of drugs with reference to biological sources geographical distribution, common varieties, macro and microscopic characters, chemical constituents, therapeutic uses, adulterants, Strychnos seeds, Senna leaves, Clove buds, <i>Allium sativum</i> , <i>Acorus calamus</i> and <i>Curcuma longa</i>	04

Suggested Readings

1. Trivedi P C, 2006. Medicinal Plants: Ethnobotanical Approach, Agrobios, India.
2. Purohit and Vyas, 2008. Medicinal Plant Cultivation: A Scientific Approach, 2nd edn. Agrobios, India.
3. Medicinal plants of India , Preeti Dhar and Durga Nath Dhar, World Scientific Publishing Company, 2019.



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T.Y.B.Sc. Botany Semester VI

Course Title	Practical based on Pharmacognosy		
Course Code: 23SBBO62MN		No. of Credits: 02	
Course Type: Minor		Total Teaching Hours: 30	

Aims & Objectives of the Course

Sr. No.	Objectives
1	Students can recall details and information about practical's in Pharmacognosy
2	To understand Plant Medicinal in daily life.
3	Students can generate and test medicinal activities of plants
4	Students can make their observations and analyze medicinal studies.
5	To create foundation for further studies on medical plants

Expected Course Specific Learning Outcome

Sr. No.	Learning Outcome
1.	To understand Indigenous Medicinal Sciences.
2.	To explain how current medicinal practices are often based on indigenous plant knowledge.
3.	To get introduced to different perspectives on treating ailments according to ethnomedicinal principles.
4.	Understand the Propagation of Medicinal Plants.
5.	To get exposure to Medicinal botany study and learn to apply it in day to day life.

SYLLABUS

Expt. No.	Title with Contents	No. of Practical
1	To study the macroscopic and microscopic study of the Senna leaf / Henna leaf.	01
2	To study the macroscopic and microscopic study of the Datura Leaf / Eucalyptus leaf.	01
3	To study the macroscopic and microscopic study of the Fennel (<i>Foeniculum vulgare</i>)	01
4	To study the macroscopic and microscopic study of the Isapgol seed (<i>Plantago ovate</i>)	01
5	To study the macroscopic and microscopic study of the Ginger (<i>Zingiber officinale</i>)	01
6	To study the macroscopic and microscopic study of the Clove (<i>Syzygium aromaticum</i>)	01
7	To study the macroscopic and microscopic study of the <i>Cinnamomum zeylanicum</i> .	01
8	To study the macroscopic and microscopic study of the Turmeric (<i>Curcuma longa</i>)	01
9	Extraction of eucalyptus oil by steam distillation.	01
10	Eucalyptus Oil Benefits and Uses.	01
11	To study the test of the <i>Acacia</i> (gum).	01
12	To study the test of the Honey.	01
13	To study the test of the Starch.	01
14	To study the test of the Castor Oil.	01
15	One day Visit to Pharmaceutical Industry / Naturopathy center.	01

Suggested Readings

01. Peach K. and Tracey M.V. (2020) Modern Methods of Plant Analysis-, Vol. I&II, Springer.
02. Farooqui A.A. and Sreeramu B.S. (2001) Cultivation of medicinal and aromatic crops, University Press,
03. Pereda-Miranda R. and de Moraes S. C. A. (2021) Trends in Pharmacognosy: 35 Years of Research on Therapeutical Natural Resources. Revista Brasileira de Farmacognosia 31, 503–504.
04. Wabale A. S. 2020. Ethno medicinal Studies of Kalsubai Harishchandragad Region of Western Ghats. Prashant Publication, Jalgaon