



Swami Shraddhanand College
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Modular Plan

Name of Teacher	Prof. Sadhna Babbar (1 Hour/week) Dr. Pradeep Kumar (1 Hour/week)	Department	Botany
Course	B. Sc. (Life Sciences) with Botany (BOT DSC-01)	Semester	I (Section – A)
Paper	Plant Diversity and Systematics	Academic Year	2023-2024

Learning Objectives

The Learning Objectives of this course are as follows:

1. To make students aware about the diversity of plants and microbes present on the planet and their evolutionary relationships.

Learning Outcomes

On completion of this course, the student will be able to understand:

- the diversity of plants and microbes.
- the possible relationships between each group.
- their general characteristics.
- approaches used for identification and classification of various groups of plants.

<i>Week No./ Date</i>	<i>Theme/ Curriculum</i>	
1. 16th August 2023	Classes Begin: Unit 1: Diversity of Life (Dr. Pradeep Kumar)	Classifying the diversity of life: Domains of Life – Eubacteria, Archaea and Eukaryotes.
	Unit 2: Microbes (Prof. Sadhna Babbar)	Viruses- General account.
2. 23rd Aug	Unit 2: Microbes (Prof. Sadhna Babbar)	Viruses- Replication, Lytic and Lysogenic cycle.
	Unit 3: Algae (Dr. Pradeep Kumar)	Brief introduction of major classes: Blue-green, Green, Brown and Red algae.

3. 30 th Aug	Unit 2: Microbes (Prof. Sadhna Babbar)	Bacteria- Structure, wall-less forms (L-forms, Mycoplasma)
	Unit 3: Algae (Dr. Pradeep Kumar)	Diagnostic features of identification; morphology, reproduction and classification with special reference to <i>Nostoc</i> .
4. 6 th September 2023	Unit 2: Microbes (Prof. Sadhna Babbar)	Bacteria- Asexual reproduction and genetic recombination.
	Unit 3: Algae (Dr. Pradeep Kumar)	Diagnostic features of identification; morphology, reproduction and classification with special reference to <i>Volvox</i> and <i>Spirogyra</i> .
5. 13 th Sep	Unit 4: Fungi (Dr. Pradeep Kumar)	Diagnostic features of identification; morphology, reproduction and classification with special reference to <i>Rhizopus</i> .
	Unit 7: Systematics (Prof. Sadhna Babbar)	Aims, fundamental components of systematics, description, identification, nomenclature, phylogeny, biosystematics.
6. 20 th Sep	Unit 4: Fungi (Dr. Pradeep Kumar)	Diagnostic features of identification; morphology, reproduction and classification with special reference to <i>Penicillium</i> .
	Unit 8: Systematics in Practices (Prof. Sadhna Babbar)	Taxonomic Hierarchy- Concept of taxa and categories.
7. 27 th Sep	Unit 4: Fungi (Dr. Pradeep Kumar)	Diagnostic features of identification; morphology, reproduction and classification with special reference to <i>Agaricus</i> ; Lichens (a general account).
	Unit 8: Systematics in Practices (Prof. Sadhna Babbar)	Botanical Nomenclature- principles and rules.
8. 4 th October 2023	Unit 5: Bryophytes, Pteridophytes and Gymnosperms (Dr. Pradeep Kumar)	Characteristic features of identification; morphology and reproduction of Bryophytes.
	Unit 8: Systematics in Practices (Prof. Sadhna Babbar)	Botanical Nomenclature- Type method
9. 11 th Oct	Unit 5: Bryophytes, Pteridophytes and Gymnosperms	Characteristic features of identification; morphology and reproduction of <i>Marchantia</i> , <i>Funaria</i>

	(Dr. Pradeep Kumar)	
	Unit 8: Systematics in Practices (Prof. Sadhna Babbar)	Botanical Nomenclature- Author citation; Valid publication.
10. 18th Oct	Unit 5: Bryophytes, Pteridophytes and Gymnosperms (Dr. Pradeep Kumar)	Characteristic features of identification; morphology and reproduction of Pteridophytes.
	Unit 8: Systematics in Practices (Prof. Sadhna Babbar)	Botanical Nomenclature- Rejection of names
11. 25th Oct	Unit 5: Bryophytes, Pteridophytes and Gymnosperms (Dr. Pradeep Kumar)	Characteristic features of identification; morphology and reproduction of <i>Pteris</i> .
	Unit 8: Systematics in Practices (Prof. Sadhna Babbar)	Botanical Nomenclature- Principle of priority and its limitations.
12. 1st November 2023	Unit 5: Bryophytes, Pteridophytes and Gymnosperms (Dr. Pradeep Kumar)	Characteristic features of identification; morphology and reproduction of Gymnosperms
	Unit 8: Systematics in Practices (Prof. Sadhna Babbar)	Botanical Nomenclature- Names of hybrids and cultivars.
13. 8th Nov	Unit 5: Bryophytes, Pteridophytes and Gymnosperms (Dr. Pradeep Kumar)	Characteristic features of identification of <i>Pinus</i> (only morphology).
	Unit 9: Systems of classification (Prof. Sadhna Babbar)	Classification: Artificial, Natural and Phylogenetic.
14. 15th Nov	Unit 6: Angiosperms (Dr. Pradeep Kumar)	Diagnostic features.
	Unit 9: Systems of classification (Prof. Sadhna Babbar)	An outline of Bentham and Hooker's (up to series only) system of classification and its merits and Demerits.
15. 22nd Nov	Unit 6: Angiosperms (Dr. Pradeep Kumar)	Structure of flower, types of inflorescences.

	Unit 9: Systems of classification (Prof. Sadhna Babbar)	An outline of Engler and Prantl's (up to Subclasses) system of classification and its merits and Demerits.
16. 29 th Nov	Unit 6: Angiosperms (Dr. Pradeep Kumar)	Structure of flower, types of inflorescences
	Unit 9: Systems of classification (Prof. Sadhna Babbar)	APG System.
Week-17 6th -12th February 2023	Dispersal of classes, Preparation leave and practical Examinations begin	

BOOKS:

- Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, 4th edition. Singapore, John Wiley and Sons (Asia).
- Kumar, H.D. (1999). Introductory Phycology, 2nd edition. Delhi, Delhi: Affiliated East West. Press Pvt. Ltd.
- Bhatnagar, S.P., Moitra, A. (1996). Gymnosperms. New Delhi, Delhi: New Age International (P) Ltd. Publishers.
- Parihar, N.S. (1991). An introduction to Embryophyta. Vol. I. Bryophyta. Prayagraj: U.P.: Central Book Depot.
- Pelczar, M.J. (2001). Microbiology, 5th edition. New Delhi, Delhi: Tata McGraw-Hill Co.
- Tortora, G.J., Funke, B.R., Case. C.L. (2007). Microbiology. San Francisco, U.S.A: Pearson Benjamin Cummings.
- Raven, P.H., Evert, RF., Eichhorn, S.E. (2013). Biology of Plants, 8th edition, New York, NY: W.H. Freeman and Company.
- Sethi, I.K., Walia, S.K. (2018). Text book of Fungi and Their Allies. (2nd Edition), Medtech Publishers, Delhi.
- Vashishta, P.C., Sinha, A.K., Kumar, A. (2010). Pteridophyta. New Delhi, Delhi: S. Chand & Co Ltd.
- Singh, G. (2020). Plant Systematics: Theory and Practice, 4th edition. CBS Publishers and Distributors, New Delhi.
- Simpson, M.G. (2020). Plant Systematics, 3rd edition, Elsevier Academic Press, San Diego, CA, U.S.A.
- Gupta R. 2011. Plant Taxonomy: past, present, and future. New Delhi: The Energy and resources Institute (TERI).
- Judd W.S., Campbell C.S., Kellogg, E. A., Stevens, P.F., Donoghue M.J. (2015). Plant Systematics: A Phylogenetic Approach 4th Edition Sinauer Associates, Oxford University Press. USA.
- <http://www.mobot.org/MOBOT/research/APweb/>. (for APG IV classification).