

Curriculum Planner

(Department of Botany, Kalindi College)

Course : B.Sc. (Hons.) Botany

Semester : I (NEP)

Paper : Plant Diversity and Evolution, (BOT- DSC-1) : Practicals

Name of the Teacher : Dr. M. ARUNJIT SINGH

To study structure of TMV and Bacteriophage (electron micrographs/models). (01)	August 2025
2. To study morphology of <i>Volvox</i> , <i>Oedogonium</i> , <i>Chara</i> , <i>Fucus</i> and <i>Polysiphonia</i> (Temporary preparation/specimens/slides). (02)	
3. To study <i>Rhizopus</i> , <i>Penicillium</i> , <i>Alternaria</i> (Temporary preparations), symptoms of rust of wheat, white rust of crucifer (specimen). (02)	August 2025
4. To study <i>Marchantia</i> (morphology, WM of rhizoids and scales), <i>Anthoceros</i> (morphology), <i>Sphagnum</i> (morphology, WM of leaf), <i>Funaria</i> (morphology WM of rhizoid and leaf). (02)	September 2025
5. To study <i>Selaginella</i> (morphology, WM of strobilus and spores), <i>Equisetum</i> (morphology, WM of spores), <i>Pteris</i> (morphology, tease mount of sporangia and spores). (03)	September 2025
6. To study <i>Cycas</i> (morphology, leaf, leaflet anatomy, coralloid root, bulbils, megasporophyll and microsporophyll); <i>Pinus</i> (morphology of dwarf shoot, needle anatomy, male and female cones, WM pollen grains). (02)	September 2025
7. To study variation in leaf venations in dicots and monocots (at least two specimens each). (01)	September 2025
8. To study the types of inflorescences in angiosperms (through specimens).(01)	October 2025
9. To study the types of fruits in angiosperms (through specimens). (01)	October 2025
	November 2025
	November 2025
Suggested/ Essential Readings 1. Campbell, N.A., Reece,J.B. (2008) Biology, 8th edition, Pearson Benjamin Cummings, San Francisco. 2. Evert, R. F., Eichhorn,S.E. (2012).Raven Biology of Plants, 8th edition, New York, NY: W.H.Freeman and Company. 3. Bhatnagar, S.P., Moitra, A. (1996).Gymnosperms. New Delhi, Delhi, New Age International (P) Ltd. Publishers..	

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(Department of Botany, Kalindi College)

Course : B. Sc. (H) Botany

Semester : III (NEP)

Paper : Bryophytes, Pteridophytes & Gymnosperms, BOT-DSC-3 : Practicals

Name of the Teacher : Dr. M. ARUNJIT SINGH

1. <i>Riccia</i> – Morphology: Vegetative and reproductive structures (Specimen).	August 2025
2. <i>Marchantia</i> - Morphology; V.S. of thallus through Gemma cup, whole mount of Gemmae (temporary slides); V.S. of Vegetative thallus, Antheridiophore, Archegoniophore, L.S. of Sporophyte (permanent slides).	August 2025
3. <i>Pellia</i> - Morphological details through specimens/permanent slides; L.S. Sporophyte (permanent slide).	September 2025
4. <i>Porella</i> - Vegetative Morphological details through specimens/permanent slides.	September 2025
5. <i>Anthoceros</i> – Morphology; Dissection of sporophyte (to show stomata, spores, pseudoelaters, columella) (temporary slide), V.S. of thallus (permanent slide).	September 2025
6. <i>Funaria</i> - Morphology; T.S. Stem (temporary and permanent slides both); Sporophyte: operculum, peristome, spores (temporary slides); Antheridial and archegonial heads, L.S. of capsule, W.M. of protonema (Permanent slides).	October 2025
5. <i>Psilotum</i> – Morphology (specimen); T.S. of rhizome, stem and synangium (permanent slides).	October 2025
6. <i>Selaginella</i> – Morphology (specimen); W.M. of leaf with ligule, T.S. of stem, L.S. of strobilus, W.M. of microsporophyll, megasporophyll (temporary slides); T.S. of rhizophore (permanent slide).	October 2025
7. <i>Equisetum</i> – Morphology (specimen), T.S. of internode, L.S. of strobilus, T.S. of strobilus, W.M. of sporangiophore, W.M. of spores (wet and dry) (temporary slide).	October 2025
8. <i>Pteris</i> - Morphology, T.S. of rachis, V.S. of sporophyll (temporary slides), T.S. of rhizome, W.M. of prothallus with sex organs and young sporophyte (permanent slide).	November 2025

9. <i>Cycas</i> – Morphology, T.S. of coralloid root, T.S. of rachis, V.S. of leaflet, V.S. of microsporophyll, W.M. of spores (temporary slides); T.S. of stem, T.S. of root, L.S. of ovule (permanent slide).	November 2025
10. <i>Pinus</i> - Morphology, T.S. of Needle, L.S. and T.S. of male cone, W.M. of microsporophyll (temporary slides); T.S. of stem, R.L.S. and T.L.S. of stem, L.S. of female cone (permanent slide).	November 2025
11. <i>Gnetum</i> - Morphology (stem, male & female cones); T.S. of stem, L.S. of ovule (permanent slide).	November 2025
Suggested/ Essential Readings 1. Bhatnagar, S.P., Moitra, A. (2023). Gymnosperms. 2nd edition, New Delhi, Delhi: New Age International (P) Ltd Publishers. 2. Kaur I.D., Uniyal P.L. (2019). Text Book of Gymnosperms. New Delhi, Delhi: Daya Publishing House. 3. Kaur I.D., Uniyal P.L. (2019). Text Book of Bryophytes. New Delhi, Delhi: Daya Publishing House. 4. Kaur I.D. (2023). Text Book of Pteridophytes. New Delhi, Delhi: Daya Publishing House. 5. Parihar, N.S. (2019). An Introduction to Embryophyta. Vol. II: Pteridophyta. Surjeet Publications.	

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(Department of Botany, Kalindi College)

Course : B. Sc. (H) Botany

Semester : III (NEP)

Paper : Phycology, BOT-DSC-3 : Practicals

Name of the Teacher : Dr. M. ARUNJIT SINGH

1. Study of algal diversity in different habitats through botanical excursion and submission of digital catalogue/report of various species observed.	August 2025
2. Nostoc : Study of vegetative, reproductive structures from temporary mounts and permanent slides; Ultrastructure of Heterocyst through Electron Micrographs.	August 2025
3. Chlorella : Study of vegetative, reproductive structures from temporary mounts. Study of ultrastructure through Electron Micrographs.	August 2025
4. Volvox : Study of vegetative, reproductive structures from temporary mounts and permanent slides.	August 2025
5. Oedogonium : Study of vegetative, reproductive structures from temporary mounts and permanent slides.	September 2025
6. Coleochaete : Study of vegetative, reproductive structures from temporary mounts and permanent slides.	September 2025
7. Chara : Study of vegetative, reproductive structures from temporary mounts, specimens and permanent slides.	September 2025
8. Vaucheria : Study of vegetative, reproductive structures from temporary mounts and permanent slides.	October 2025
9. Diatoms and Dinoflagellates : Study vegetative, reproductive structures of at least two taxa from water bodies.	October 2025
10. Ectocarpus : Study of vegetative, reproductive structures from temporary mounts and permanent slides.	November 2025
11. Sargassum : Study of vegetative, reproductive structures from temporary mounts, specimens and permanent slides.	November 2025
12. Polysiphonia/ Gracilaria : Study of vegetative, reproductive structures from temporary mounts and permanent slides.	November 2025
	November 2025

Suggested/ Essential Readings 1. Bhatnagar, S.P., Moitra, A. (2023). Gymnosperms. 2nd edition, New Delhi, Delhi: New Age International (P) Ltd Publishers. 2. Kaur I.D., Uniyal P.L. (2019). Text Book of Gymnosperms. New Delhi, Delhi: Daya Publishing House. 3. Kaur I.D., Uniyal P.L. (2019). Text Book of Bryophytes. New Delhi, Delhi: Daya Publishing House. 4. Kaur I.D. (2023). Text Book of Pteridophytes. New Delhi, Delhi: Daya Publishing House. 5. Parihar, N.S. (2019). An Introduction to Embryophyta. Vol. II: Pteridophyta. Surjeet Publications.	

Course : B. Sc. (H) Botany

Semester : III (NEP)

Paper : Phycology, BOT-DSC-3 : Theory

Name of the Teacher : Dr. M. Arunjit Singh

Unit 1: Introduction to Algal World 6 hours Relevance of studying algae – Industrial (food, feed, fodder), Environmental (climate change, biofuel, acidification of oceans), Evolutionary (range of thallus organization); General characteristics; Ecology, diversity and distribution; Range of thallus organization; Cell structure; Criteria for classification (cell wall, pigment system, reserve food, flagella); Reproduction and life cycle patterns; Classification by Fritsch; Evolutionary classification of Lee (only up to groups); Significant contributions of eminent Phycologists. Unit 2: Cyanophyceae (Blue-Green Algae) 3 hours General characteristics; Occurrence; Cell structure; Heterocyst (structure and function); Morphology, reproduction and life-cycle of <i>Nostoc</i> , economic importance. Unit 3: Chlorophyceae (Green Algae) 6 hours General characteristics; Occurrence; Cell structure; Morphology, reproduction and life-cycle of <i>Chlamydomonas</i> , <i>Volvox</i> , <i>Chlorella</i> , <i>Ulva</i> ,	August 2025
	August 2025
	September 2025
	September 2025

<i>Oedogonium</i>, <i>Coleochaete</i>; <i>Chara</i>; Structure and evolutionary significance of <i>Prochloron</i>, economic importance. Unit 4: Xanthophyceae (Yellow-Green Algae) 2 hours General characteristics; Occurrence; Morphology, reproduction, and life-cycle of <i>Vaucheria</i>, economic importance. Unit 5: Bacillariophyceae (Diatoms) and Dinophyceae (Dinoflagellates) 3 hours General characteristics, Occurrence, morphology, unique features, economic importance. Unit 6: Phaeophyceae (Brown Algae) 4 hours General characteristics; Occurrence; Morphology, reproduction, and life-cycle of <i>Ectocarpus</i> and <i>Sargassum</i>, economic importance. Unit 7: Rhodophyceae (Red Algae) 4 hours General characteristics; Occurrence; Morphology, reproduction, and life-cycle of <i>Gracilaria</i>, economic importance. Unit 8: Recent advances in algal studies 2 hours Model systems and their applications in genetic, molecular and evolutionary studies.	September 2025 October 2025 October 2025 November 2025 November 2025
Suggested/ Essential Readings 1. Bhatnagar, S.P., Moitra, A. (2023). Gymnosperms. 2nd edition, New Delhi, Delhi: New Age International (P) Ltd Publishers. 2. Kaur I.D., Uniyal P.L. (2019). Text Book of Gymnosperms. New Delhi, Delhi: Daya Publishing House. 3. Kaur I.D., Uniyal P.L. (2019). Text Book of Bryophytes. New Delhi, Delhi: Daya Publishing House. 4. Kaur I.D. (2023). Text Book of Pteridophytes. New Delhi, Delhi: Daya Publishing House. 5. Parihar, N.S. (2019). An Introduction to Embryophyta. Vol. II: Pteridophyta. Surjeet Publications.	