

Economic Botany and Plant Anatomy

Course Code: BEB410
Contact Hours: 60

Credit: 04 (L-3, T-1, P-0)
MM: 100

Course Objectives:

1. To study the properties of water and soil of different areas.
2. To study the aquatic and terrestrial micro-flora.
3. To maintain a biodiversity record of a given area.
4. To learn the taxonomy and embryology of higher plants.
5. To understand the introduction to the major principles of evolutionary theory, and ranges from the origins of life and mode of survival
6. The origin and diversification of plant groups through Earth's history.
7. Geologic time periods in Earth's history.
8. The ecological changes and impacts of plants on the Earth.
9. To determine the age of fossils and importance of pollen.

UNIT I: Introduction to Ecology: definition, community and ecosystem, Inter-relationships between living world and environment, biosphere, biomes, ecosystem components (abiotic and biotic). Environment related concepts and laws (theory of tolerance, laws of limiting factors). Community characteristics: organization and concept of habitats and niche. Bioenergetics. Biogeochemical and Hydrological cycles.

UNIT II: Plant-water relations: importance of water to plant life, physical properties of water; imbibition, diffusion and osmosis; absorption and transport of water; transpiration; physiology of stomata. **Mineral nutrition:** essential macro and micro elements and their role; mineral uptake; deficiency symptoms.

UNIT III: Transport of organic substances: mechanism of phloem transport, source-sink relationship, factors affecting translocation. **Photosynthesis:** significance, historical aspects, photosynthetic pigments, action spectra and enhancement effects, concept of two photosystems, Z-scheme, photo-phosphorylation; Calvin cycle, C4 pathway, CAM plants. **Respiration:** Glycolysis, Krebs Cycle and ETS System; photorespiration.

UNIT IV: Growth and development: definitions, phases of growth and development; seed dormancy; plant movements; the concept of photoperiodism; physiology of flowering, florigen concept; physiology of senescence; fruit ripening. auxins, gibberellins, cytokinins, abscissic acid and ethylene, history of discovery, mechanism of action; photo-morphogenesis; phytochromes in a brief.

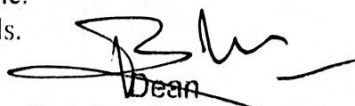
UNIT V: Origin of life: elementary knowledge of theories related to evolution of life; types of evolution; speciation; population genetics, HW Equilibrium; Genetic drift. **Plant fossils:** fossils and fossilization, kinds of fossils-impressions. casts, molds, petrifications and coal ball; **Geological time scale,** Importance of Paeleobotany

Suggested Reading:

- 1) Plant Metabolism (2nd Edition). Dennis, D.T., Turpin, D.H., Lefebvre, D.D. and Layzell (eds.). 1997: Longman. Essex, England.
- 2) Life Processes in Plants. Galston, A.W. 1989: Scientific American Library, Springer-Verlag, New York, USA.
- 3) Introduction to Plant Physiology. Hopkins, W.G., 1995: John Wiley & Sons, Inc., New York, USA.
- 4) Plant Physiology. Mohr, H. and Schopfer, P. 1995: Springer-Verlag, Berlin Germany.

CO: By the end of this course, students will be able to:

- Know the methods for plants preserve and fossilize.
- Understand the origin and diversification of plant groups.
- Understand geologic time scale.
- To determine the age of fossils.


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