



GOVIND GURU TRIBAL UNIVERSITY BANSWARA

B.Sc.

Three-Year Graduate Course

Semester II

BOTANY

Discipline Centric Course (DCC)

Plant Ecology and Taxonomy

Unit 1: Plant Ecology Introduction, Population and Community Ecology

Definition and Scope of Ecology. Levels of organization; from Population to Biome. Biotic and Abiotic factors. Natality, Mortality, Age and Sex Ratio, Growth Rate, Biotic Potential, Deme, Ecotype, Biotype, Plant Community-Introduction and Concept, Plant Succession-Processes and types-Hydrosere, Xerosere. Energy Partitioning: r and k selection. Concept of habitat, ecological Niche and Guild.

Unit 2: Ecosystem Ecology and Angiosperms Systematics.

Ecosystem: Concept, Structure and Function; food Chain, Food Web, Trophic Levels, Ecological Pyramid. Biomass production- primary and secondary productivity. Energy Flow and Biogeochemical Cycles-Phosphorus and Nitrogen Cycle. Taxonomic Hierarchy –Concept of taxa (family, genus, species); Herbarium Techniques. Botanical Nomenclature- Principles and rules of ICBN, Systems of classification of Bentham and Hooker and Engler and Prantle. APG System-Introduction.

Unit 3: Angiosperm Families: Diagnostic features and economic importance.

Diagnostic features and economic importance of Ranunculaceae, Papaveraceae, Caryophyllaceae, Cucurbitaceae, Fabaceae, Asteraceae, Solanaceae, Apiaceae, Asclepiadaceae, Lamiaceae, Euphorbiaceae and Poaceae.

Suggested Reading:

- William D. and Sally D. (2023), Ecology 6th edition. Publisher OUP, USA
- Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4th edition.
- Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
- Smith, Thomas M. and Smith Robert Leo. (2015) Elements of Ecology. Pearson Edition, 9th edition

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- Tyagi Y. D. & Kshetrapal S., An Introduction to Taxonomy of Angiosperms.
- Subramanyam N.S., Modern Plant Taxonomy
- Pandey B.P. (2001) Taxonomy of Angiosperm, S. Chand and Company Ltd.
- Sharma O.P. (2017) Plant Taxonomy. McGraw Hill Education.
- Gurcharan Singh. 2004. Plant Systematics: Theory and Practice Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
- Nordenstam, B., El Gazaly, G. and Kassas, M. 2000. Plant Systematics for 21st century.

Practical Exercises

1. Description of given angiospermic plant in technical language, identification up to family,
Floral formula, floral diagram
 - I. Brassicaceae : *Brassica*
 - II. Malvaceae : *Hibiscus*
 - III. Asclepediaceae : *Calotropis*
 - IV. Euphorbiaceae : *Ricinus communis*
 - V. Lamiaceae : *Coriandrum sativum*
 - VI. Fabaceae : *Pisum, Cassia, Mimosa*
 - VII. Cucurbitaceae : *Citrullus*
 - VIII. Asteraceae : *Tridax*
 - IX. Solanaceae : *Datura*
 - X. Poaceae : *Triticum*
2. Study of morphological and anatomical adaptations in hydrophytes – *Hydrilla, Eichhornia, Typha, Vallisneria* and *Nymphaea* (any two)
3. Study of morphological and anatomical adaptations in xerophytes -*Asparagus, Nerium, Casuarina, Euphorbia, Cycas, Opuntia* (any two)
4. Study of community characteristics by quadrat method (Frequency, Density and Abundance)
5. Determination of water holding capacity of different soils
6. To determine the texture of different soils by sieve method.

Scheme of Practical Examination

S. No.	Exercise	Marks
1.	Exercise-1 Taxonomy Major	17
2.	Exercise-2 Taxonomy Minor	10
3.	Exercise-3 Ecology Major	17
4.	Exercise-4 Ecology Minor (Plant Adaptation)	10
5.	Spot Test (1-6)	18
6.	Record	8
7.	Viva Voce	20


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