

GENERIC ELECTIVES (BOT-GE-1)

Credit distribution, Eligibility and Pre-requisites of the Course

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course |
|---|----------|-----------------------------------|----------|--------------------|----------------------|-----------------------------|
| | | Lecture | Tutorial | Practical/Practice | | |
| Plant Diversity and Human Welfare BOT-GE-1 | 4 | 2 | 0 | 2 | - | Nil |

Learning Objectives

Build awareness about the different groups of plants and their roles in supporting human life.

Learning outcomes

After studying this course, the student will gain knowledge about:

- the diversity of various groups of plants, their characteristics and identification.
- different phytogeographic zones in India.
- the basic principles of conservation of Biodiversity and Sustainable Development Goals (SDG).
- the role of plants in human welfare.

SYLLABUS OF BOT-GE-1

Unit 1: Understanding biodiversity

Weeks: 03

Understanding biodiversity - definition of key terms; plant diversity in India; assigning value to plant diversity; economic and ecological importance of Algae, Bryophytes, Pteridophytes and Gymnosperms; insights into flowering plant diversity with special focus on agrobiodiversity.

Unit 2: Crop diversity **Weeks: 04**

Crop diversity in various phytogeographic regions in India and their traditional importance as food (including cereals, pulses, oil crops, spices, beverages, fruits and nuts, vegetables, condiments), medicines (Ashwagandha and Sarpagandha) and adornments.

Unit 3: Role of forests **Weeks: 03**

Forests, woodlands, and vegetation stands: diversity and their importance in ecological, aesthetic, and overall well-being; social dimensions of plant diversity; commercial value and utilization of plant wealth.

Unit 4: Cash Crops **Weeks: 2.5**

Crops of high economic value (tobacco, sugarcane, cotton, basmati rice, sandalwood, saffron); Petro crops: the future industry (*Jatropha* sp., corn and sugarcane).

Unit 5: Conservation of biodiversity **Weeks: 1.5**

Conservation of biodiversity using community driven conservation strategies, sustainable utilization keeping Sustainable Development Goals (SDGs) in mind, Innovative approaches and traditional methods of biodiversity utilization and waste minimization during product formation.

Unit 6: Policy issues in conservation of Biodiversity **Week: 01**

National and International initiatives and programmes/schemes focusing on Plant Diversity and human welfare (Tribal Rights Bill, Convention on Biological Diversity (CBD), International Union for Conservation of Nature (IUCN), Protection of Plant Varieties and Farmers' Rights Authority (PPVFRA).

Practicals:

1. To study local plant diversity (common Algae, Bryophytes, Pteridophytes, Gymnosperms (any two of each) in and around the campus; and understand their ecological and economic importance. **(Weeks: 02)**

2. Microchemical tests for carbohydrates, proteins and oils. **(Weeks: 02)**

3. To study (any three) commonly found tree species in the vicinity and understand their role in human welfare. **(Weeks: 02)**
4. To prepare an inventory of common medicinal plants in your campus (identify to the family level, list their uses in Indian System of Medicines) **(Weeks: 02)**
5. To visit the local parks and list the trees planted. Also assess some for their dust pollution mitigation capacity using standard procedures. **(Weeks: 02)**

6. Industrial visit to see how the drugs are extracted from plants (report to be submitted for evaluation). **(Weeks: 02)**

Essential/recommended readings:

- Bilgrami, K. S. (1998). Phytodiversification and Human Welfare: Dedicated to Late Prof. KS Bilgrami, FNA (1933-96). MD Publications Pvt. Ltd.
- Utting, P. (2013). Trees, People and Power. Routledge.
- Manoharachary, C., Nagaraju, D. (2016). Medicinal plants for human health and welfare. Ann. Phytomed, 5(1), 24-34.

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Suggestive reading:

- Myers, N. (2019). A wealth of wild species: storehouse for human welfare. Routledge