

Programme Name	Pre-Ph.D. Course Work	Programme Code	23-
Course Code	BT-102 (1)	Credit	3
Year/Sem	1/1	L-T-P	3-0-0
Course Name	MEDICINAL & AROMATIC PLANTS OF HIMALAYAN REGION		

Objectives of the Course:

1. To identify medicinal and aromatic plants of Himalayan region.
2. To study different techniques utilized for phytochemical studies.
3. To skill the techniques of plant cell and tissue culture procedures.
4. To explore technological advancements for improvement of medicinal plants.

UNIT I Medicinal & aromatic plants of Himalayan region (Total Topics- 15 and Hrs- 10)

Himalayan region as biodiversity hot–spot; Study of morphology, habit , habitat and propagation of medicinal and aromatic plants; utilization of medicinal plants in traditional and modern system of medicine, Application of medicinal / aromatic plants in cosmetic, health care and food industry. Impact of climate, soil biology and abiotic factors on growth, propagation and reproduction of medicinal plants. Case study- *Withania somnifera*, *Piccirrhiza kurroa*, *Valerina wallichii*, *Raolvia serpentina*.

UNIT II Phytochemical and analytical studies (Total Topics-12 and Hrs-10)

Different secondary metabolites of medicinal and aromatic plants, alkaloids, terpenes, flavonoids. Plants as source of Antimicrobial compounds, anticancer, antioxidant, anti-inflammatory metabolites. Screening of plants for identification of phytochemicals, HPLC, GC-MS, FTIR, Quantitative and qualitative estimation.

UNIT- III Plant tissue culture (Total Topics- 12 and Hrs- 10)

Cell and tissue culture technique, explant selection, culture media, direct and indirect organogenesis, androgenesis, somatic hybridization, protoplast isolation and fusion, suspension culture, callus regeneration, role of plant growth regulators in micropropagation, applications of plant tissue culture, acclimatization and hardening of micropropagated plants.

UNIT-IV Technological advancement for improvement of plant varieties (Total Topics-10 and Hrs-10)

Biotechnological approach for improvement of plant varieties- gene transfer, vectors, transgenic plants, stress tolerance in plants, production of bio- active metabolites, plant growth promoting rhizobacteria- IAA Production, siderophore production, HCN activity. Application of nanotechnology to medicinal plants.

Course Outcomes (COs)

1. Exhibit understanding of habitat and cultivation of aromatic and medicinal plants..
2. Acquire skills for phytochemical analysis of medicinal plant and their respective application in healthcare and medicine
3. Application of plant tissue culture technique for conservation and mass propagation of endangered medicinal plants.
4. Inculcate scientific temperament to appraise technological application for improvement of medicinal plants.

References:

Books

1. Slater. Plant biotechnology: the genetic manipulation of plants. Oxford.
2. Ákos Máthé and Irfan Ali Khan. Medicinal and aromatic plants of India, Springer.