

ECONOMIC BOTANY AND PLANT BIOTECHNOLOGY

THEORY

**Unit 1: Origin of Cultivated Plants**

Concept of centres of origin, their importance with reference to Vavilov's work

(4 lectures)

**Unit 2: Cereals**

Wheat -Origin, morphology, uses

(2 lectures)

**Unit 3: Legumes**

General account with special reference to Gram and soybean

(4 lectures)

**Unit 4: Spices**

General account with special reference to clove and black pepper (Botanical name, family, part used, morphology and uses)

(3 lectures)

**Unit 5: Beverages**

Tea (morphology, processing, uses)

(3 lectures)

**Unit 6: Oils and Fats**

General description with special reference to groundnut

(4 lectures)

**Unit 7: Fibre Yielding Plants**

General description with special reference to Cotton (Botanical name, family, part used, morphology and uses)

(4 lectures)

**Unit 8: Introduction to biotechnology**

(1 lecture)

**Unit 9: Plant tissue culture**

Micropropagation ; haploid production through androgenesis and gynogenesis; brief account of embryo & endosperm culture with their applications

(8 lectures)

**Unit 10: Recombinant DNA Techniques**

Blotting techniques: Northern, Southern and Western Blotting, DNA Fingerprinting; Molecular DNA markers i.e. RAPD, RFLP, SNPs; DNA sequencing, PCR and Reverse Transcriptase-PCR.

Hybridoma and monoclonal antibodies, ELISA and Immunodetection. Molecular diagnosis of human disease, Human gene Therapy. **(15 lectures)**

### PRACTICALS

1. Study of economically important plants : Wheat, Gram, Soybean, Black pepper, Clove Tea, Cotton, Groundnut through specimens, sections and microchemical tests
2. Familiarization with basic equipments in tissue culture.
3. Study through photographs: Anther culture, somatic embryogenesis, endosperm and embryo culture; micropropagation.
4. Study of molecular techniques: PCR, Blotting techniques, AGE and PAGE.

### ESSENTIAL READINGS

1. Kochhar, S.L. (2011). Economic Botany in the Tropics, MacMillan Publishers India Ltd., New Delhi. 4<sup>th</sup> edition.
2. Chawla, H.S. (2002). Introduction to Plant Biotechnology, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi. 2<sup>nd</sup> edition.