

localization of starch grains, W.M. starch grains, Micro-chemical tests).

4. Spices: Clove, Blackpepper (Habit and sections L.S./T.S.), Saffron, fennel (specimen/digital resources)

1. Beverages: Tea (plant specimen, tea leaves), Coffee (plant specimen, beans) 04 Hours
2. Fibres: Jute (specimens/digital resources of *Corchorus capsularis* and *C. olitorius*, T.S. stem, test for cellulose and lignin on section of stem and fibre). Cotton (specimen, W.M. seed to show lint and fuzz; W.M. fibre and test for cellulose)
3. Oil-Yielding Plants: Fatty Oils: Groundnut (Habit-specimen, Fruit, seeds, Microchemical Tests) Coconut-Habit (photograph), Fruit, T.S. nut, Mustard - (Habit- specimen, Fruit, seeds); Essential Oils: Habit Sketch of Rose, Jasmine, Vetiver, Sandalwood and Eucalyptus (specimens/photographs)
4. Drug-Yielding plants: Habit - Fever Bark Tree, Poppy, Foxglove and Cannabis (Specimens/ Photographs)
1. Tobacco: *Nicotiana tabacum* and *N. rustica* (specimens/photographs), Tobacco Products
2. Rubber: Para Rubber-Habit, Tapping of latex (Specimen/photograph), Rubber Products

11. Petro-crops: *Saccharum officinarum*, *Jatropha* sp.

DISCIPLINE SPECIFIC CORE
COURSE - 5: Plant Resources and
Economic Botany

Theory

February 2026

March 2026

Assignment

<p>Unit 1: Introduction and Origin of Cultivated Plants</p> <p>Importance of Plant Resources; Vavilov's concept for the Origin of cultivated plants; Centres of Origin (Primary and Secondary); Centres of diversity, Harlan's concept of gene pools. Plant Genetic Resources and their conservation.</p> <p>Unit 2: Cereals</p> <p>Wheats (Origin, Evolution of Wheats (tetra- & hexaploid), Morphology, Production, and Economic Importance of Hexaploid Wheat); Rice (Origin-Monophyletic and Polyphyletic, Production, Morphology, Comparison between indica and japonica Rice, Parboiling, 4 Economic Importance); Other cereals: Maize, Barley, Oats, Millets (jowar, bajra, ragi) and Pseudocereals.</p> <p>Unit 3: Legumes</p> <p>General account (Nutritive Value of Pulses, Protein Malnutrition, Lathyrism, Favism, Ecological Importance); chick pea and pigeon pea (Production, Morphology and Economic Importance). Other Legumes: Lentil, Cluster Bean, Lathyrus, Beans, Pea, Cowpea, Fodder legumes and Green manure crops.</p> <p>Unit 4: Sugars and Starches</p> <p>Sugarcane (Morphology, Ratooning, Nobilization, Products and By-products); Potato (Morphology, Tuber Anatomy, Seed Tubers vs True Potato Seeds and Economic uses).</p> <p>Unit 5: Spices, Condiments & Flavourings</p> <p>General Account (Spices, Condiments, Culinary Herbs and Essences, with</p>		<p>2012). Economic Botany in Tropics. New Delhi, India: S.L. (2016). Economic Botany.</p>
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examples), Importance of Spices, Clove (Morphology, Anatomy of part used and Economic Importance) and Black Pepper (Morphology, Anatomy of part used and Economic Importance). Other examples: Ginger, Turmeric, Cinnamon, Saffron, Cardamom, Chillies & Pepper, Fennel, Coriander, Cumin, Vanilla, Nutmeg.

Unit 6: Beverages

Types of Beverages (Alcoholic and Non-Alcoholic) with examples, Tea and coffee

(Morphology, Chemistry, Processing and Economic Importance)

Unit 7: Fibres and Fibre-yielding plants

Classification of Fibres based upon their Origin (surface fibres, bast fibres, and leaf fibres, with examples); Jute (morphology, extraction and economic importance), Cotton (Gossypium species, morphology, processing and economic importance) Comparison between Jute and Cotton fibers. Other examples: Flax, Hemp and Coconut.

Unit 8: Oil-Yielding Plants

Fatty Oils and Essential Oils, Comparison between Fatty Oils and Essential Oils; Fatty Oils (Classification with examples, keeping quality), Groundnut (Morphology and Economic Importance); Essential Oils (General characteristics, Methods of Extraction and Economic Importance, with examples). Other examples: Rapeseed & Mustard (canola), Coconut, Olive, Castor, Cottonseed, Sesame, Soybean, Linseed.

Unit 9: Medicinal and Drug-Yielding Plants

<p>Brief Account of Therapeutic Drugs with Examples; Morphology, Chemical Constituents, Economic Importance of Cinchona, Rauwolfia, Digitalis.</p> <p>Unit 10: Fumigatory & Masticatory</p> <p>Tobacco (Morphology & its - <i>Nicotiana tabacum</i> & <i>N. glauca</i>), Processing, Products,</p> <p>Economic Importance and Health Hazards), Cannabis, Papaver (Morphology, Chemical Constituents, Economic Importance)</p> <p>Unit 11: Rubber Para Rubber - <i>Hevea brasiliensis</i> (Morphology, Tapping of latex, Processing, Products and Economic Importance)</p> <p>Unit 12: Fruits & Nuts</p> <p>Tropical & Temperate; Citrus, Mango, Banana, Apple, Pineapple, Papaya; Nuts: Cashew, Walnut, Almond & Pistachio.</p> <p>Unit 13: Vegetables</p> <p>Common examples of root crops, leafy vegetables (herbage), fruit seed vegetables;</p>		
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B.Sc. (H) Botany

Semester- II

DISCIPLINE SPECIFIC CORE COURSE - 5: Plant Resources and Economic Botany

Practicals

Economic Botany and Biotechnology

LS-DSC-

BOT - 6

Theory	Month wise schedule	Assignment	Suggested reading
<p>Unit 1: Origin of Cultivated Plants</p> <p>Concept of centres of origin, their importance with reference to Vavilov's work.</p> <p>Unit 2: Cereals and millets 04 hours</p> <p>Wheat, Rice and Maize: Origin, description of the part used, economic importance. Major and minor millets (Pearl millet, Sorghum, Kodo millet and Finger millet).</p>	<p>January 2026</p>	<p>Assignment</p>	<p>Kochhar, S.L. (2011). Economic Botany in the Tropics, 4th edition.</p>
<p>Unit 3: Pulse crops 02 Hours</p> <p>General account and economic importance with special reference to chickpea and pigeon pea.</p> <p>Unit 4: Spices</p> <p>General account, part used and economic importance with special reference to cardamom, clove and black pepper.</p>	<p>January 2026</p>		<p>Bhojwani, S.S., Razdan, M.K. (1996). Plant Tissue Culture: Theory and Practice. Amsterdam, Netherlands: Elsevier Science.</p>
<p>Unit 5: Beverage 02 Hours</p> <p>Tea; morphology, types, processing, uses.</p> <p>Unit 6: Oils and Fats 02 Hours</p> <p>General account; Classification, Difference between essential oils and fatty oils, uses (Sunflower, Soybean, Mint)</p>			<p>15. Bhojwani, S. S. and Dantu, P. K. (2013). Plant Tissue Culture: An Introductory Text. Springer</p>
<p>Unit 7: Fibre Yielding Plants</p> <p>Classification of fibres. Cotton and Jute, description of part used and uses.</p>	<p>February 2026</p>		

<p>02 Hours</p> <p>Unit 8: Plant Tissue Culture Technology 05 Hours</p> <p>Introduction; nutrient media; aseptic and culture conditions, organogenesis (direct and indirect) and somatic embryogenesis; androgenesis, embryo culture, endosperm culture,</p> <p>protoplast culture Applications: micropropagation, generation of somaclonal variants,</p> <p>synthetic seeds and germplasm conservation.</p> <p>Unit 9: DNA Recombinant Technology 08 Hours</p> <p>Introduction, Blotting techniques (Southern and Northern); PCR; Molecular DNA markers (RAPD, RFLP) and DNA fingerprinting in plants. Genetic Engineering Techniques: Gene cloning vectors (pUC18, Ti plasmid); enzymes (nuclease, polymerase, kinase, ligase);</p> <p>screening for gene of interest by DNA probe hybridisation, Insertion of genes into plant (Agrobacterium mediated, biolistics); selection of recombinants by selectable marker and</p> <p>reporter genes (GUS). Applications: Bt cotton, Golden rice, Flavr-Savr tomato, Edible vaccines.</p>	<p>March 2026</p> <p>April 2026</p>		
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