

Course Title: Economic Botany

Course code: IBOTIC005T

Maximum marks: 100

Credits: 4

Total teaching hours: 60

Course objectives

This course will teach students about the various uses of plants and plant products by humans. Students will also learn the taxonomic diversity of useful plants and they will be able to recognize geographical, historical and cultural differences in the use and importance of plants. The other portion of this course is intended to disseminate scientific information of the traditional knowledge and customs of a people concerning plants and their medical, religious, and other uses.

Learning outcomes

After completion of course students will be able to:

- 1) Get an overview on different types of plants used for economic purposes.
- 2) Recognize members of the major angiosperm families by identifying their diagnostic features and economic importance.

THEORY

Unit I: Plants as part of human culture

Origin and role of agriculture in shaping human history, Centres of origin of plants by Vavilov, Evolution of plants during domestication and production of new varieties

Unit II: Food, Spices, Beverages and Medicinal plants

Origin, morphology and uses of cereals (rice, wheat and maize); pulses (gram, soybean and pea); vegetables (potato, tomato and onion); spices (ginger, turmeric and cloves) and beverages (tea and coffee). Processing of tea and coffee. General features and uses of medicinal plants (*Cinchona*, *Rauwolfia*, *Atropa*, *Catharanthus*, *Papaver*, *Cannabis* and *Azadirachta*)

Unit III: Fruits, Nuts, Timber and Fibres

Origin, morphology and uses of fruits (Apples, Banana and Mango) and nuts (Almond, Walnut and Cashew nut). Botanical description and uses of timber (Teak, Bamboo and Deodar); oils (Groundnut, Olive, Mustard and Coconut); essential oils (Rose and Lemon grass); fibres (Cotton, Jute and Flax)

Unit IV: Rubber, Sugar and Importance of lower Plants and Microbes

Rubber (*Hevea brasiliensis* and *Ficus elastica*) and sugar (sugarcane and sugar beet).

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Utilization of algae, fungi, lichens, bryophytes and pteridophytes in agriculture, in medicine and as food products. Their role in nitrogen fixation, treatment of waste and as pollution indicators.

PRACTICALS

1. Cereals: Study of habit, L.S./T.S. of grain, starch grains and microchemical tests of rice and wheat.
2. Legumes: Study of habit, fruit, seed structure, micro-chemical tests of pea and groundnut.
3. Sugars: Study of habit of sugar cane and sugar beet.
4. Spices: Study of habit and sections of black pepper, fennel, clove and cumin seeds.
5. Beverages: Study of morphology of tea and coffee plants.
6. Oils and Fats: Coconut - T.S. of mature fruit, Mustard - plant and seed morphology and microchemical tests of crushed seeds.
7. Essential oil yielding plants: Study of morphology of *Rosa*, *Vetiveria*, *Cymbopogon*, *Santalum* and *Eucalyptus* (specimens/photographs).
8. Rubber: Study of plant morphology using specimen or photograph, model of tapping, samples of rubber products.
9. Drug-yielding plants: Study of specimens of *Digitalis*, *Rauwolfia*, *Papaver* and *Cannabis*.
10. Woods: Study of specimens and sections of young stem of *Tectona*, *Dalbergia sisso* and *Pinus*.
11. Fiber yielding plants: Cotton (specimen, whole mount of seed to show lint and fuzz fibers, whole mount of fiber and test for cellulose), Jute (specimen, test for lignin on transverse section of stem and fiber).

Suggested Readings

1. Kochhar, S.L. (2012). *Economic Botany in Tropics*, MacMillan & Co. New Delhi, India.
2. Wickens, G.E. (2001). *Economic Botany: Principles & Practices*. Kluwer Academic Publishers, The Netherlands.
3. Chrispeels, M.J. and Sadava, D.E. (2003). *Plants, Genes and Agriculture*. Jones & Bartlett Publishers.