

OEC1: PLANTS FOR HUMAN WELFARE

Course: Plants for human welfare	Course code:
L-T-P per week: 4-0-0	No of credits: 03
Internal Assessment: 40 marks	Semester end Examination: 60 marks
Total contact hours: 45	

Course Outcomes (COs):

At the end of the course students will be able to:

CO1: Identify edible and nonedible plants and evaluate the values and uses of biodiversity: Ethical and aesthetic values.

CO2: Understand and assess importance of cereals, millets, legumes and nuts and their nutrient contents.

CO3: Apply skills to manage plant biodiversity

CO4: Familiar with names of common fruits, food value and health benefits of fruits of Indian subcontinent (temperate and tropical regions).

CO5: Analyse composition of edible portion of common vegetables (earth vegetables, underground stem, herbage vegetables and fruit vegetables).

CO6: Identify and classify common spices, condiments and flavouring materials.

CO7: Understand the importance of and decide which are the best natural sugars, starches and cellulose products; beverage plants and beverages, and fiber plants for good health.

CO8: Assess utility of forests and forest products.

Units	Content of the OEC1	50 hrs
Unit-1	<p>Introduction: A general overview of economically important plants and their role in human welfare as food, oil drugs, nutraceuticals, beverages, fibre, timber, biofuels, ornamental and as environment protection through carbon sequestration</p> <p>Food crops:Cereals: Origin, cultivation and food values of important crops. Eg., wheat, rice, maize, grain, legumes (pulses), studies pertaining to their improvement through breeding and genetic engineering.</p> <p>Spices and condiments: Important spices, structure and their economic values</p> <p>Alcoholic and non-alcoholic beverages: Tea, coffee types, processing, uses and improvement</p>	9hrs
Unit-2	<p>Medicinal and nutraceuticals: Traditional plants as source of drugs used against several serious diseases such as cancer, diabetes, malaria, dengue, psoriasis etc. Plant secondary metabolites, classification, roles in human welfare with reference to case studies, knowledge of extraction, isolation and characterization of bioactive metabolites, elicitation of secondary metabolites from anticancerous plants such as <i>Podophyllum</i>, <i>Taxus</i>, <i>Catharanthus</i>, <i>Psoralia</i>, <i>Nordostachys</i>, <i>Piper</i>. Antimalarial plants: <i>Artemisia</i>, <i>Spilanthes</i>, <i>Holarrhena</i> etc. and antidiabetics – <i>Stevia</i>, <i>Gymnema</i>, <i>Momordica</i>, <i>Azadirachta</i> etc. Edible vaccines</p> <p>Nutraceuticals and functional foods: Important plants such as <i>Moringa</i>, <i>Piper</i>, <i>Amaranthus</i>, <i>Mentha</i>, Blue berries nuts etc. Nutritionally rich genetically modified plants such as golden rice, flavr-savr tomato.</p>	9 hrs

Unit -3	Edible and non-edible oils: Classification of oils, oil yielding plants, processing and purification of different edible oils such as mustard, olive, sunflower oil, safflower peanut oil. Non-edible oils: Jojoba (<i>Simmondsia chinensis</i>), <i>Sesamum indicum</i> oil, Linseed oil, Eucalyptus oil, Citrus oil etc. Plant based Biofuels: <i>Jatropha</i> , <i>Pongamia</i> , <i>Zea mays</i> , <i>Madhuca</i> etc. Extraction and economic viability, Application as alternate source of diesels.	9 hrs
Unit-4	Plants as a source of timber: <i>Tectona grandis</i> , <i>Salix</i> sp., <i>Dalbergia sisso</i> (sheesham) and fuel wood, type and resources. Fibre yielding plants- Cotton (<i>Gossyoiium</i> sp.), Jute (<i>Corchorussp</i>), sun-hemp (<i>Crotolariasp</i>) with special reference to current advances pertaining to their improvement through breeding and genetic transformation e.g., Bt-cotton.	9 hrs
Unit-5	Plants for Horticulture, floriculture and ornamental values: Brief introduction of different type of horticultural and ornamental plants (carnation, anthurium, orchids etc.) and their commercial aspects; recent development of novel varieties through grafting, breeding and genetic transformation for pigment modification.	9 hrs

Text Books:

1. Hill AF 1952. Economic Botany, Tata-McGraw Hill, New Delhi
2. Kochhar SL. 1998. Economic Botany of Tropics, Macmillan India Publishers, New Delhi.

Reference Books:

3. Pandey BP. 2000. Economic Botany. S. Chand & Company, New Delhi
4. Pandey SN and Chandha A. 1999. Economic Botany. Vikas Publishing House Pvt. Ltd., New Delhi