DEPARTMENT OF BOTANY
VALUE ADDED COURSE

Semester	Course Code	Course Title	Hours
III	21UBOVAC1	PLANTS AND HUMAN WELFARE	30

Course Outcomes:

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

CO1. List down the benefits of plants to human life.

CO2. Demonstrate the inevitable nature of plants resource to human.

CO3. Solve minor health issues by using a planned vegetarian diet.

CO4. Explain the economic importance of plant resources.

CO5. Justify the entrepreneurial options based on natural resources.

Unit 1: Plants in daily life **6 hrs**

Fibrous diet, uses of salad, green leafy vegetables and green tea. Importance of mushrooms and spices in human health.

Unit 2: Legumes and nuts **6 hrs**

Legumes – Chick pea, Beans, Cow pea, Soybean and its importance in diet. Nuts – General characters, major groups of nuts, common nuts of Indian subcontinent – Cashew nut, walnuts, almond, chestnuts and its importance in human health.

Unit 3: Fruits **6 hrs**

Definition - Common fruits of Indian subcontinent. Classification, food value and importance of following fruits – apple, apricot, banana, cherry, fig, grapes. Guava, jack fruit, lemon, mango, mangostan, orange, papaya, pineapple, peach, pear and watermelon.

Unit 4: Essential oils **6 hrs**

Essential oils - Chemical nature, significance and application of essential oils. Important essential oils – Otto of roses, camphor, jasmine, geranium, lemongrass, sandalwood, cedarwood and eucalyptus oil. Role of essential oils in aroma therapy.

Unit 5: Medicinal Plants **6 hrs**

Medicinal plants – Historical details. Specific example of drugs obtained from various parts of the plant. Leaves(Digitalis; Holy basil),Root(Aconite; Ginseng), Barks(Quinine; Slippery elm), Stem and Woods(Ephedrine; Quassia), Flowers(Hops; Santonin), Fruits (Bel; Colocynth) and Seed (Strophanthus; Nux-vomica).

Reference Books

1. Jain SK, Manual of Ethnobotany, 1st Edition, Scientific Publishers Journals Pvt Ltd, New Delhi, India, 1995.
2. Pandey P and Choudhary S, Plants for human welfare, 1st Edition, Atharva publications, New Delhi, India, 2008.
3. Sharma OP, Plants and Human Welfare, 1st Edition, Pragati Prakashan Publications, Meerut, India, 2015.

Semester	Course Code	Course Title	Hours
V	21UBOVAC2	BIONANOTECHNOLOGY	30

Course Outcomes:

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

CO1. Define the basics of bionanotechnology.

CO2. Summarize the analytical methods used in bionanotechnology.

CO3. Make use of bionanotechnology in modern breeding techniques.

CO4. Recommend the bionanoparticles in various applications for human welfare.

CO5. Solve problems in the fields of food & medicine using biotechnology.

Unit 1: Concepts of bionanotechnology 6 hrs

Basic concepts of Bionanotechnology – Definition, history and importance in agriculture, food, health, energy and environment.

Unit 2: Analytical methods of nanotechnology 6 hrs

Analytical methods for bionanotechnology. Principles, bioimaging, biosensors, overview of optical metrology for bionanotechnology, biological scanning probe microscopy.

Unit 3: Nanotechnology in tissue engineering 6 hrs

Introduction to tissue engineering. Application of nanotechnology in plant tissue culture and stem cell research. Regulatory approach on advanced therapy medicinal products.

Unit 4: Manufacture and functions of bionanoparticles 6 hrs

Manufacture and functions of bionanoparticles. Nanoparticle and drug delivery, microbial nanoparticle production, environmental bionanotechnology – application in microbial techniques and waste water treatment.

Unit 5: Application of bionanotechnology 6 hrs

Bionanotechnology in agriculture - Precision farming, smart delivery systems, Role in Food Industry and Food Microbiology.

Reference Books

1. Rishabh Ahand, Essentials of Nanotechnology, Scientific International Pvt. Ltd. New Delhi, India, 2015.
2. Manoj Bhatia, Nanotechnology, ANMOL Publications Pvt.Ltd. New Delhi, 2010.