I Semester

Open Elective Course (OE-1)

Title: Plants and Human Welfare

Course Outcome:

On completion of this course, the students will be able to

1. To make the students familiar with economic importance of diverse plants that offer resources to human life.

2. To make the students known about the plants used as-food, medicinal value and also plant source of different economic value.

3. To generate interest amongst the students on plants importance in day today life, conservation, ecosystem and sustainability.

Number of Theory Credits	Number of lecture hours/semester	Number of practical Credits	Number of practical hours / semester
3	42	0	00

Content of Theory	42 Hrs
Unit – I	**14 Hrs**
Chapter – 1: Origin of Cultivated Plants. Concept of Centres of Origin, their importance with reference to Vavilov's work. Examples of major plant introductions. Crop domestication and loss of genetic diversity (Only conventional plant breeding methods). Importance of plant bio- diversity and conservation.	**04 Hrs**
Chapter – 2: Cereals: Wheat and Rice (origin, evolution, morphology, post-harvest Processing & uses).Green revolution. Brief account of millets and their nutritional Importance.	**04 Hrs**
Chapter – 3: Legumes: General account (including chief pulses grown in Karnataka- red gram, green gram, chick pea, soybean). Importance to man and ecosystem.	**03 Hrs**
Chapter – 4: Fruits: Mango, grapes and Citrus (Origin, morphology, cultivation, processing and uses).	**03 Hrs**

Unit – II	**14 Hrs**
Chapter – 5: Cash crops: Morphology, new varieties and processing of sugarcane, products and by-products of sugarcane industry. Natural Rubber –cultivation, tapping and processing. **Chapter – 6: Spices:** Listing of important spices, their family and parts used, economic importance with special reference to Karnataka. Study of fennel, clove, black pepper and cardamom. **Chapter – 7: Beverages:** Tea, Coffee (morphology, processing & uses) **Chapter – 8: Oils and fats:** General description, classification, extraction, their uses and health implications; groundnut, coconut, sunflower and mustered (Botanical name, family & uses). Non edible oil yielding trees and importance as biofuel. Neem oil and applications.	**04 Hrs** **03 Hrs** **03 Hrs** **04 Hrs**
Unit – III	**14 Hrs**
Chapter – 9: Essential Oils: General account. Extraction methods of sandal wood oil, rosa oil and eucalyptus oil. Economic importance as medicine, perfumes and insect repellents. **Chapter – 10: Drug-yielding plants:** Therapeutic and habit-forming drugs with special reference to Cinchona, Digitalis, Aloe vera and Cannabis. **Chapter – 11: Fibers:** Classification based on the origin of fibers; Cotton and jute (origin morphology, processing and uses). **Chapter – 12: Forests:** Forest and forest products. Community forestry. Concepts of reserve forests, sanctuaries and national parks with reference to India. Endangered species and red data book.	**04 Hrs** **03 Hrs** **03 Hrs** **04 Hrs**

Text Books and References

1. Kochhar, S.L. (2012). Economic Botany in Tropics. New Delhi, India: MacMillan & Co.
2. Wickens, G.E. (2001). Economic Botany: Principles &Practices.The Netherlands: Kluwer Academic Publishers.
3. Chrispeels, M.J. and Sadava, D.E. (1994) Plants, Genes and Agriculture.Jones& Bartlett - Publishers.

Pedagogy:

Lectures, Practicals, Field and laboratory visits, Participatory Learning, Seminars, Assignments, specimen submission etc

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
I TEST	15
II TEST	15
ASSIGNMENT	10
Total	40

Date **Course Co-ordinator** **Subject Committee Chairperson**

II Semester

Open Elective (OE-2)

Title: Plant Propagation, Nursery management and Gardening

Paper Outcome:

On completion of this course, the students will be able to

1. To gain knowledge of gardening, cultivation, multiplication, raising of seedlings of garden plants.
2. To get knowledge of new and modern techniques of plant propagation.
3. To develop interest in nature and plant life.
4.

Number of Theory Credits	Number of lecture hours/semester	Number of practical Credits	Number of practical hours / semester
3	42	0	00

Content of Theory Course 1	42 Hrs
Unit I	
Nursery: Definition, objectives and scope and general practices and building up of infrastructure for nursery, planning and seasonal activities. Planting - direct seeding and transplants, Soil free/soilless/ synthetic growth mediums for pots and nursery.	08
Unit II	
Seed: Structure and types - Seed dormancy; causes and methods of breaking dormancy. Seed storage: Types of storage, Seed banks, factors affecting seed viability, seed germination and seed production technology. Seed testing and certification.	08

Unit III	
Vegetative propagation: Air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings. Hardening of plants .Green house, mist chamber, shed root, shade house and glass house.	08
Unit IV	
Gardening: Definition, objectives and scope. Different types of gardening - landscape and home/terrace gardening, parks and its components. Plant materials and design. Computer applications in landscaping, Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting.	10
Unit V	
Sowing/raising of seeds and seedlings - Transplanting of seedlings - Study of cultivation of different vegetables and flowering plants: cabbage, brinjal, lady's finger, tomatoes, carrots, bougainvillea, roses, geranium, ferns, petunia, orchids etc. Storage and marketing procedures. Developing and maintenance of different types of lawns. Bonsai technique.	08

Text Books and References

1. Agrawal, P.K. (1993). Hand Book of Seed Technology. New Delhi, Delhi: Dept. of Agriculture and Cooperation, National Seed Corporation Ltd.
2. Bose T.K., Mukherjee, D. (1972). Gardening in India. New Delhi, Delhi: Oxford & IBH Publishing Co.
3. Jules, J. (1979). Horticultural Science, 3rd edition. San Francisco, California: W.H. Freeman and Co.
4. Kumar, N. (1997). Introduction to Horticulture. Nagercoil, Tamil Nadu: Rajalakshmi Publications.

Additional Resources:

1. Musser E., Andres. (2005). Fundamentals of Horticulture. New Delhi, Delhi: McGraw Hill Book Co.
2. Sandhu, M.K. (1989). Plant Propagation. Madras, Bangalore: Wile Eastern Ltd.

Pedagogy:

Lectures, Practical, Field and laboratory visits, Participatory Learning, Seminars, Assignments, specimen submission etc.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
I TEST	15
II TEST	15
ASSIGNMENT	10
Total	40

Date **Course Co-ordinator** **Subject Committee Chairperson**

B.Sc. BOTANY – III Semester

Open Elective Course (OEC-3) (OEC for other students)

Paper: Landscaping and Gardening

Code: OEC-3.3

Course code	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
OEC-3.3	OEC	Theory	03	03	42 hrs	2 hrs	40	60	100

Learning outcomes:

After the completion of this course the learner will be able to:

- Apply the basic principles and components of gardening
- Conceptualize flower arrangement and bio-aesthetic planning
- Design various types of gardens according to the culture and art of bonsai
- Distinguish between formal, informal and free style gardens
- Establish and maintain special types of gardens for outdoor and indoor landscaping

Unit I **14 Hrs.**

Principles of gardening, garden components, adornments, methods of designing rockery, water garden, etc. their walk-paths, bridges, constructed features. Special types of gardens, trees, their design, values in landscaping, propagation, planting shrubs and herbaceous perennials. Importance, design values, propagation, planting of climbers and creepers, palms, ferns, grasses and cacti succulents.

Unit II **14 Hrs.**

Flower arrangement: importance, production details and cultural operations, constraints, post-harvest practices. Bio-aesthetic planning: definition, need, round country planning, urban planning and planting avenues, schools, villages, beautifying railway stations, dam sites, hydroelectric stations, colonies, river banks, planting material for play grounds.

Unit III **14 Hrs.**

Vertical gardens and public gardens. Landscape designs, Styles of garden, formal, informal and freestyle gardens, types of gardens, Urban landscaping, Landscaping for specific situations, institutions, industries, residents, hospitals, road sides, traffic islands, dam sites, IT parks and corporate. Establishment and maintenance, Bio-aesthetic planning, eco-tourism, therapeutic gardening, non-plant components, water-scaping, xeri-scaping, hard-scaping; outdoor and indoor scaping, exposure to CAD (Computer Aided Designing).

REFERENCES:

1. Berry, F. and Kress, J. (1991). Heliconia: An Identification Guide. Smithsonian Books
2. Butts, E. and Stensson, K. (2012). Sheridan Nurseries: One hundred years of People, Plans, and Plants. Dundurn Group Ltd.
3. Sudhir Pradhan (2018). Landscape gardening. Scientific Publishers India.
4. Gavino Merlo (2018). Floriculture and landscaping. Scitus Academics LLC.
5. Percy Lancasters (2004). Gardening in India. Oxford & IBH publishers.
6. Laeeq Futehally (2008). Gardens. National book trust India Publishers.
7. Ekta Chaudhary (2022). Garden Up. Penguin Random House India publishers.
8. Prathap Rao M (2020). Landscape Design. Standard Publishers and Distributors Pvt.
9. Percy Lancasters (2008). Gardening in India. 2nd Edition, Oxford & IBH publishers

B.Sc. BOTANY – IV Semester

Open Elective Course (OEC- 4) (OEC for other students)

Paper: Floriculture

Code: OEC-4.3

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures / Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
OEC-4.3	OEC	Theory	03	03	42 hrs	2 hrs	40	60	100

Learning outcomes:

After completing this course the learner will be able to:

- Develop conceptual understanding of gardening from historical perspective
- Analyse various nursery management practices with routine garden operations.
- Distinguish among the various Ornamental Plants and their cultivation
- Evaluate garden designs of different countries
- Appraise the landscaping of public and commercial places for floriculture.
- Diagnoses the various diseases and uses of pests for ornamental plants

Unit I **14 Hrs.**

Introduction: History of gardening; Importance and scope of floriculture and landscape gardening. Nursery Management and Routine Garden Operations: Sexual and vegetative methods of propagation; Soil sterilization; Seed sowing; Pricking; Planting and transplanting; Shading; Stopping or pinching; Defoliation; Wintering; Mulching; Topiary; Role of plant growth regulators.

Unit II **14 Hrs.**

Ornamental Plants: Flowering annuals; Herbaceous perennials; Divine vines; Shade and ornamental trees; Ornamental bulbous and foliage plants; Cacti and succulents; Palms and Cycads; Ferns and fern allies; Cultivation of plants in pots; Indoor gardening; Bonsai. Principles of Garden Designs: English, Italian, French, Persian, Mughal and Japanese gardens; Features of a garden (Garden wall, Fencing, Steps, Hedge, Edging, Lawn, Flowerbeds, Shrubbery, Borders) Water-garden. Some Famous gardens of India.

Unit III **14 Hrs.**

Landscaping Places of Public Importance: Landscaping highways and Educational institutions. Commercial Floriculture: Factors affecting flower production; Production and packaging of cut flowers; Flower arrangements; Methods to prolong vase life; Cultivation of Important cut flowers (Carnation, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolus, Marigold, Rose, Lillium, and Orchids). Diseases and Pests of Ornamental Plants.

REFERENCES:

1. Randhawa, G.S. and Mukhopadhya, A. (1986).Floriculture in India. Allied Publishers.
2. Adams, C., M. Early and J. Brook (2011). Principles of Horticulture. 6th Edition, Routlledge Publishers London.
3. Chowdhari T.K.*et al* (2022) Text book on Floriculture Vol. 1 Narendra Publishing House New Delhi.
4. Anil K Singh and Anjana Sisodia (2017). Text Book of Floriculture and Landscaping. Nipa Genx Electronic resources and Solutions Pvt. Ltd.
5. Text Book of Floriculture & Landscaping by Anil K Singh, Anjana Sisodia (2020), New India Publishing Agency (Publisher)
6. Bharati Kashyap, Anil K. Thakur. (2020). Dinesh Gardening & Floriculture (Skill Enhancement Course) S Dinesh and Co Publishers.
7. Arvinder Singh and Nomita Laishram (2013). Objective Floriculture. Kalyani Publishers.
8. Subhash V. Ahire, Sharayu D. Sathe, Sanjay P. Ghanwat, Hemanthkumar A. Thakur, Bapu K. Avchar (2015). Horticulture And Floriculture, Success publishers, Pune.