

DEPARTMENT OF HORTICULTURE

Programme outcome (PO):

After completion of the programme the students will be able to:

1. Transfer knowledge of Agriculture/Horticulture in the field of agricultural research especially in horticulture including fruits, vegetables, flowers, spices, medicinal and aromatic plants and their management.
2. Develop innovative agro- techniques to enhance the production and productivity of horticultural crops.
3. Increase farmers' income through adopting hi-tech horticulture
4. Create job opportunities for the unemployed youths through teaching, research, training, extension etc., especially for the development of socially and economically depressed segment of society.
5. Establishment of models nurseries in rural areas for availability of quality planting materials.
6. Conservation and exploitation of biological diversity through crop management.
7. Prolong the post harvest storage life of horticultural commodities and increase income through value addition of the products and to reduce post harvest losses.

Course outcomes (CO):

HORT-101: Propagation and Nursery Management of Horticultural Crops 6 Cr. (4 + 2)

1. Familiarization with principles and practices of propagation and nursery management for Horticultural Crops.
2. Study of introduction to propagation, cellular basis for propagation, sexual propagation, apomixis, polyembryony, chimeras. Principle factors influencing seed germination of horticultural crops, dormancy, hormonal regulation of germination and seedling growth.
3. Knowledge of nursery management, nursery establishment and nursery rules and regulation.

HORT- 102: PRODUCTION TECHNOLOGY OF COOL SEASON VEGETABLE CROPS

6 Cr. (4 + 2)

1. Educate production technology of cool season vegetables.
2. Imparting knowledge about botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post-harvest management, plant protection measures and seed production of vegetables grown in winter.

HORT-103: PRODUCTION TECHNOLOGY OF TEMPERATE FRUITS, 4 Cr. (3 + 1)

1. Impart basic knowledge about the importance and management of temperate fruits grown in India.
2. Study of commercial varieties of regional, national and international importance, ecophysiological requirements, recent trends in propagation, rootstock influence, planting system, cropping systems, root zone and canopy management, nutrient management, water management, fruit set and development, abiotic factors limiting fruit production, physiological of flowering, and remedies, quality improvement by management practices; maturity indices, harvesting, grading, packing, precooling, storage, transportation and ripening techniques.
3. Knowledge of industrial and export potential, Agri Export Zones (AEZ) and industrial support of fruit business.

HORT -104: POST HARVEST MANAGEMENT FOR HORTICULTURAL CROPS

4 Cr. (3 + 1)

1. Facilitate deeper understanding on principles and methods of postharvest management of horticultural crops.
2. Maturity indices, harvesting practices for specific market requirements, influence of pre and post-harvest practices, respiration, transpirational loss.
3. Physiology and biochemical change during ripening, senescence, ethylene evolution and ethylene management, factors leading to post-harvest loss and its control, pre- cooling.
4. Study of post harvest loss and their control.

HORT-105: GROWTH AND DEVELOPMENT OF HORTICULTURAL CROPS

4 Cr. (3 + 1)

1. Teach the physiology of growth and development of horticultural crops.
2. Cellular structures and their function; definition of growth and development, growth analysis and its importance in Horticultural crops.
3. Physiology of dormancy and germination of seeds, tubers and bulbs; Role of auxins, gibberellins, cytokinins and abscissic acid; Application of synthetic hormones, plant growth retardants and inhibitors and modern PBRs for various purposes in horticultural crops.

HORT-201: PRODUCTION TECHNOLOGY OF TROPICAL AND DRY LAND FRUITS

4 Cr. (3 + 1)

1. Impart basic knowledge about the importance and management of tropical and dry land fruits grown in India.
2. Brief knowledge of commercial varieties of regional, national and international importance eco-physiological requirements, recent trends in propagation, rootstock influence, planting systems, cropping system, root zone and canopy management, nutrient management, water management, fertigation, role of bio regulators, abiotic factors limiting fruit production, physiology of flowering, pollination fruit set and development, honeybees in cross pollination, physiological disorders – causes and remedies, quality improvement by management practices; maturity indices, harvest, grading, packing, storage and ripening techniques; industrial and export potential, Agri. Export Zones (AEZ) and industrial support.

HORT-202: PRODUCTION TECHNOLOGY OF WARM SEASON VEGETABLE CROPS

4 Cr. (3 + 1)

1. Teach production technology of warm season vegetables.
2. Introduction to warm season vegetables, their botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercropping operations, weed control, mulching, physiological disorders, harvesting, post harvest management, plant protection measures, economics of crop production and seed production.

HORT-203: LANDSCAPING AND ORNAMENTAL GARDENING

4 Cr. (3 + 1)

1. Familiarization with principles and practices of landscaping and ornamental gardening.
2. Landscape designs, its principles and practices of landscaping and ornamental Gardening structure, features.
3. Styles of garden, types of gardens: English, Mughal, Japanese, Persian, Spanish, Italian, Vanams, Buddha garden, Popular gardens of India.

HORT-204: PROTECTED CULTIVATION OF HORTICULTURAL CROPS, 4 Cr. (3 + 1)

1. Understanding the principle, theoretical aspects and developing skills in protected cultivation of horticultural crops.
2. Prospects of protected horticulture in India; Types of protected structures- Greenhouse, poly house, shade houses, rain shelters etc. Low cost/Medium, cost/High cost structures, Location specific designs; Structural components; Suitable horticultural crops for protected cultivation.

HORT-205: BIOTECHNOLOGY OF HORTICULTURAL CROPS, 4 Cr. (3 + 1)

1. Understandings the principles, theoretical aspects and developing skills in biotechnology of horticultural crops
2. Harnessing bio-technology in horticultural crops, influence of plant materials, physical, chemical factors and growth regulators on growth and development of plant cell, tissue and organ culture.
3. Callus culture types, cell division, differentiation, morphogenesis, organogenesis, embryogenesis. Cell culture, tissue and organ culture, hardening.

HORT-301: PRODUCTION TECHNOLOGY OF SUBTROPICAL FRUITS 4 Cr. (3 + 1)

1. Impart basic knowledge about the importance and management of subtropical fruits grown in India.
2. Study of commercial varieties of regional, national and international importance, eco-physiological requirements, recent trends in propagation, rootstock influence, planting system, cropping systems, root zone and canopy management, nutrient management, water management, fruit set and development, abiotic factors limiting fruit production, physiological of flowering, and remedies, quality improvement by management practices; maturity indices, harvesting, grading, packing, precooling, storage, transportation and ripening techniques; industrial and export potential, Agri Export Zones (AEZ) and industrial support.

HORT-302: SPECIAL STATISTICAL METHODS IN HORTICULTURAL RESEARCH AND COMPUTER APPLICATION 4 Cr. (3 + 1)

1. Understanding the principle, theoretical aspects and developing skills in special statistical methods in horticultural crops and computer application.
2. Quantitative treatments factors, site selection and characterization.
3. Replication of experiments units, plot structure, plot type, plot size, plot shape, Guards and borders, Interference between plots.

HORT-304: PRODUCTION TECHNOLOGIES OF ORNAMENTAL PLANTS**4 Cr. (3 + 1)**

1. Impart basic knowledge about the importance and production technology of cut flowers grown in India.
2. Educate the students about scope of cut flowers in global trade, global scenario of cut flower production, varietal wealth and diversity, area under cut flowers and production problem in India- Patent right, nursery management, media for nursery, special nursery practices.
3. Growing environment, open cultivation, protected cultivation, soil requirements, artificial growing media, soil decontamination techniques, planting methods, influence of environmental parameters, light, temperature, moisture, humidity and CO₂ on growth and flowering.

HORT-305: PRODUCTION TECHNOLOGY OF MEDICINAL AND AROMATIC CROPS

4 Cr. (3 + 1)

1. Impart comprehensive knowledge about the production technology of medicinal and aromatic crops.
2. Study of Herbal industry, Indian system of medicine, indigenous Traditional Knowledge, IPR issues, Classification of medicinal crops, Systems of cultivation, Organic Production, Role of institutions and NGO's in production, GAP in medicinal crops production.
3. Knowledge of production technology for Senna, Periwinkle, Coleus, Aswagandha, Glory lily, Sarpagandha, Dioscorea sp., Aloe vera, Phyllanthus amarus, Andrographis paniculata.

HORT- 306: BREEDING OF HORTICULTURAL CROPS

4 Cr. (3 + 1)

1. Update knowledge on the recent research trends in the field of breeding of fruit crops with special emphasis on tropical, subtropical and temperate crops grown in India.
2. Evolutionary mechanisms adaptation and domestication, Genetic resource, cytogenetics, cytomorphology, chemotaxonomy, genetics of important traits and their inheritance pattern, variation and natural selection, spontaneous mutations, incompatibility systems in fruits, recent advances in crop improvement efforts- introduction and selection chimeras, apomixes, clonal selection, intergeneric, interspecific and intervarietal hybridization, mutation and polyploidy breeding, resistance breeding to biotic and abiotic stresses, breeding for improving quality, molecular and transgenic approaches in improvement of selected fruit crops.

HORT-401: PRESERVATION AND VALUE ADDITION IN FRUITS AND VEGETABLES

4 Cr. (3 + 1)

1. Teach the physiology and principle of fruit and vegetable preservation.
2. Fundamentals of preservation (principles and practices). Micro-organism associated with spoilage of fruits and vegetables. Source of micro-organism, conditions, infection and control.
3. Various methods of preservation like low temperature preservation, refrigeration, cellar storage, freezing, vacuum freezing, high temperature preservation.

HORT-402: SEED PRODUCTION TECHNOLOGY OF VEGETABLE

4 Cr. (3 + 1)

1. Educate principles and methods of quality seed and planting material production in vegetable crops.
2. Definition of seed and its quality, new seed policies; DUS test, scope of vegetable seed industry in India.
3. Genetical and agronomical principles of seed production; methods of seed production; use of growth regulators and chemicals in vegetable seed production; floral biology, pollination, breeding behaviour, seed development and maturation; methods of hybrid seed production.

HORT-403 : ORGANIC HORTICULTURE

4 Cr. (3 + 1)

1. Develop understanding of organic horticulture production system including Good Agricultural Practices (GAP).
2. Organic horticulture - definition, synonyms and misnomers, principles, methods, merits and demerits.
3. Impart knowledge of system for organic farming, components of organic horticultural systems, different organic input, their role in organic horticulture, role of Bio-fertilizers, bio-dynamics and its recent developments.
4. Impact of organic farming on eco-system.

Programme Specific outcomes (PSOs):

1. Demonstrate a working knowledge and appreciation of the diversity of plants, their culture and utilization.
2. Apply horticultural principles to the successful growth and production of horticultural plants.
3. Demonstrate the knowledge, skills and attributes to be successful contributing members of the horticulture profession.
4. Synthesize and integrate information to solve horticultural problems.
5. Communicate effectively within the discipline and also be able to transmit knowledge and skills to lay-persons in the general public.
6. Apply concepts of horticulture science to select, manage, and improve plants and their products
7. Demonstrate competence with laboratory and/or field-based technologies used in modern horticulture
8. Anticipate and recognize problems, identify causes of these problems, quantify potential impacts, analyze options, identify viable solutions, and evaluate actions and consequences of treatments and interventions
9. Understand how global issues including climate change, energy use, water availability, and/or food safety impact sustainability of horticultural systems locally, nationally, and globally
10. Apply principles of accounting, business law, labor, marketing, and personnel management to a horticultural business and contribute to developing various components of a business plan
11. Quantify economic importance of plants in managed ecosystems and the impact of horticultural crops in food systems