

M.Sc. Horticulture and Landscape Management Semester - I

Theory

Core Paper 101	:	Fundamentals of Horticulture
Core Paper 102	:	Plant Propagation
Core Paper 103	:	Commercial Floriculture
Core Paper 104	:	Pomology

Practicals

Practical 101	:	Corresponding to papers 101 and 102
Practical 102	:	Corresponding to papers 103 and 104

Semester -II

Theory

Core Paper 201	:	Olericulture
Core Paper 202	:	Ornamental Horticulture and Nursery Management
Core Paper 203	:	Plantation Crops, Spices and Condiments
Core Paper 204	:	Green House Management
*Non-core Paper	:	----- (To be opted by the student from among the papers offered by other Departments)

Practicals

Practical 201	:	Corresponding to papers 201 and 202
Practical 202	:	Corresponding to papers 203 and 204

Semester - III

Theory

Core Paper 301	:	Ornamental Gardening and Landscape Management
Core Paper 302	:	Vegetable Seed Production, Medicinal and Aromatic Plants
Core Paper 303	:	Plant Growth Regulators and Meteorology
Core Paper 304	:	Biostatistics
*Non-core Paper	:	----- (To be opted by the student from among the papers offered by other Departments)

Practicals

Practical 301	:	Corresponding to papers 301 and 302
Practical 302	:	Corresponding to papers 303 and 304

Semester - IV

Theory

Core Paper 401	:	Landscape Design and Ecology
Core Paper 402	:	Recent Advances in Horticulture
Core Paper 403	:	Preservation of Fruits and Vegetables
Core Paper 404	:	Post -harvest technology of Horticultural Crops and Marketing Strategies

M.Sc. Horticulture and Landscape Management - Semester – I

Core Paper 101: Fundamentals of Horticulture

Importance of Horticulture, divisions of Horticulture-importance and scope classification of Horticultural plants, Brief note on some families of Horticultural importance. Agroecological regions of India, major Horticultural crops grown in different Agroecological regions of India.

Soils, classification of soils, selection of site for establishing an orchard. Orchard plan, systems of planting. Establishment of an orchard.

Nutrition of Horticultural plants. Organic & inorganic fertilizers, method & time of application. Identification of deficiency symptoms & remedial measures. soil & leaf analysis.

Assessment of irrigation requirements for different horticultural crops. Different types irrigation methods with emphasis on Micro-irrigation.

Flower bud initiation and formation, factors affecting them, environmental influences, chemical, nutritional management practices.

Pests belonging to the animal & Plant kingdom – principles and methods of control, classification of pesticides, formulations & methods of pesticide application, environmental safety concern, - IPM strategies.

Practicals:

1. Study of tools and implements – their usage and identification.
2. Mapping of horticulture zones of India and Andhra Pradesh.
3. Seedbed preparation and sowing.
4. Seed viability tests.
5. Different methods of application of manures, fertilizers, insecticides.
6. Field identification of vegetative and flower buds in different horticultural crops.

References :

1. Principles of Horticulture Denisen E L 1957. Macmillan
Publishing Co, New York
2. Fundamentals of Fruit Gardner V R Bradford F C and
Production Hooker Jr. H D 1957. MacGraw Hill
Book Co., New York.
3. Fundamentals of Edmond J B Senn T L Andrews F S
Horticulture and Halfacre R G 1963. Tata
McGraw Hill Publishing Co.,
4. Introduction to Horticulture Kumar N 1990. Rajyalakshmi
Publications Nagargoil, Tamilnadu
5. Hand Books of Horticulture ICAR

M.Sc. Horticulture and Landscape Management - Semester – I

Core Paper 102: Plant Propagation

Introduction, principles and classification of plant propagation methods.

Sexual propagation and its importance. Seed germination, process of seed germination. Factors affecting germination and pregermination treatments
Seed production, characteristics of good seeds. Principles of pure seed production, viability tests.

Asexual propagation and its importance Propagation of plants by cuttage, factors affecting regeneration of plants from cuttings, Types of cuttings. Propagation by layerage. Factors affecting regeneration of plants by layerage. Methods of layerage.

Propagation by grafting, importance of graftage. Terminology used in grafting. Factors for successful grafting, formation and steps in graft union.

Selection of rootstock and scion. Methods of budding and grafting. Graft incompatibility, bud wood selection. Root stocks for commercial fruit plants. Role of root stocks in fruit production. Production of Nursery stock. Propagation of fruit and ornamental plants.

Micropropagation of plants. Types of aseptic cultures, advantages and disadvantages. Types of media, preparation of media and inoculation of explants. Preparation for establishing in the soil.

Practicals:

1. Study of pregermination treatments to seeds and seed viability tests.
2. Types of cuttings and their preparation
3. Methods of layering and their preparation.
4. Grafting and budding methods and their preparation.
5. Propagation of important fruit and ornamental plants.

6. Visit to local tissue culture/biotechnology laboratories.
7. Preparation of media, and inoculation of explants.

References

1. Propagation of Tropical Fruit Trees Garmer R J and Choudhri S A 1972. Oxford & IBH Publishing Co., New Delhi.
2. Propagation of Fruit Crops Mukherjee S K and Majumder P K 1973. ICAR, New Delhi.
3. Plant Propagation – Principles and Practices Hartman H T and Kester D E 1976. Prentice Hall of India Pvt. Ltd., Bombay.
4. Plant Propagation Sadhu M K 1996. New Age International Publishers, New Delhi.

M.Sc. Horticulture and Landscape Management - Semester – I

Core Paper 103: Commercial Floriculture

Importance, origin, distribution, classification, species and varieties, of commercial flower crops such as roses, chrysanthemum, Jasmine, carnations, gladiolus, anthurium, tuberose, china aster, lillium, marigold, crossandra, gerbera, dahlia and orchids.

Propagation and production technology of the above flower crops.

Environmental factors affecting growth, pest and disease management in the above flower crops.

Practicals:

1. Raising of one seasonal cut flower crop by each student.
2. Propagation techniques of rose.
3. Identification and description of jasmine species and varieties.
4. Training and pruning techniques in rose.
5. Pinching and disbudding in chrysanthemum and dahlia.
6. Visit to local Hi-tech floriculture project.
7. Visit to local farmers' field for marigold cultivation.
8. Visit to local farmers field for chrysanthemum and gladiolus cultivation.
9. Visit to local farmers field for tube rose cultivation.

References:

1. Commercial Flower Forcing
Alex Laurie Kiplinger D C and Kennard Nelson S 1976. McGraw Hill Company, New York.
2. Introduction to Floriculture
Lersen R A 1981. Academic press, New York.

3. Ornamental Horticulture
In India Chadha K L and Chaudhury B 1986.
Publications and information division
ICAR, New Delhi.
4. Floriculture in India Randhawa G S and Mukhopadhyaya A
1986. Allied Publishers Pvt. Ltd., New
Delhi.
5. Commercial Flowers Bose T K and Yadav L P 1989.
Nayaprakash, Calcutta.
6. The Rose in India Pal B P 1991. Publications and
Information Division ICAR, New Delhi.

M.Sc. Horticulture and Landscape Management - Semester – I

Core Paper 104: Pomology

Area, production, importance, origin, Climate, soils, classification and identification of species and varieties, root stocks, stock and scion relationship, role in high density planting, Planting methods, training and pruning, flowering, fruit set, problems in fruit set, cultural practices and pest management of following crops.

Tropical Fruits: Mango, Banana, Citrus, grape, pineapple, guava, papaya, sapota, pomegranate & litchi.

Temperate Fruits: Apple, pear, peaches, cherry, almond.

Practicals:

1. Identification and classification of mango varieties.
2. Descriptive blank, description of commercial mango varieties.
3. Identification of citrus group of fruits and varieties.
4. Descriptive blank for oranges, mandarins, limes and lemons.
5. Classification, identification of banana varieties
6. Visit to commercial orchards to study cultural practices of important fruit crops.
7. Identification, classification and description of grape varieties.
8. Identification and description of guava and sapota varieties.
9. Description of pineapple varieties and methods of propagation.
10. Description and identification of apple varieties and propagation techniques, methods of training under different planting systems.
11. Description, and propagation techniques of peaches.
12. Visit to fruit markets of Hyderabad to study varietal characters of temperate fruits.

References:

1. Fruit Growing in India Hyes W B 1953, Kitabistan, Allahabad
2. Fruits Tropical and Subtropical Bose T K and Mitra S K 1990. Naya Prakash, Calcutta.
3. Fruits Ranjit Singh 1992, N.B.T., New Delhi.
4. Small Fruit Culture Shoemaker 1934. McGraw Hill book Co., New York.
5. Temperate Fruits Mitra S.K. Rathore D S and Bose T K 1992. Horticulture and Allied Publishers, Calcutta.
6. Tropical Horticulture Bose. T K & Mitra S.K. Naya Prakash, Calcutta.

M.Sc. Horticulture and Landscape Management - Semester – II

Core Paper 201: Olericulture

Importance of vegetables. Classification of vegetables, types of vegetable gardens. Detailed study regarding history, origin, area and production. Varieties, soil, climatic requirements, cultural practices and pest management in the following crops

Vegetable crop - Okra.

Solanaceous crops - tomato, brinjal, chillies, sweet pepper, potato.

Cucurbitaceous crops - cucumber, pumpkin, ridge gourd, Snake gourd bitter gourd, bottle gourd, melons like water melon.

Leguminous vegetables - cluster bean, cowpea, french bean, dolichos bean.

Cole crops - Cabbage, cauliflower

Root crops - Radish, Carrot, beetroot.

Bulb crops - Onion and garlic.

Tuber crops - Sweet potato, tapioca, amorphophallus, colacasia, dioscorea, yam.

Leafy Vegetables - Amaranthus, palak, spinach, menthi, sorrel.

Perennial Vegetables - drumstik, coccinia, parwal murraya.

Practicals:

1. Identification and description of varieties of vegetables.
2. Planning and layout of a kitchen garden.

M.Sc. Horticulture and Landscape Management - Semester – II

Core Paper 202: Ornamental Horticulture and Nursery Management

Description and cultivation of herbaceous perennials, woody perennials and bulbous, tuber and corm plants.

Culture care and maintenance of cacti, succulents, ferns, palms, grasses, cycads.

Pruning and Training – General Principles, plant sanitation, Aesthetic, Reproductive and physiological objectives. General guidelines for pruning. Training & pruning of fruit & ornamental trees, special training & pruning techniques.

Location of Nursery. Climatic & economic considerations. Nursery structures – Nursery beds, cold frames, lathhouses, mistchambers. Types of nursery production. Propagation media & containers.

Soil and seed treatment, seedsowing, pricking, hardening. Pinching, Planting & transplanting, shading, potting, & Repotting, nursery plant arrangement & display pricing strategy, labour requirement, nursery budgeting & maintenance of records.

Practicals:

1. Identification of ornamental bulbous plants.
2. Identification of ornamental foliage plants.
3. Identification of cacti and other succulents.

4. Identification of palms and cycads.
5. Identification of ferns and selaginellas.
6. Identification of ornamental grass, bamboos and reeds.
7. Preparation of nursery seed bed.
8. Seed treatment.
9. Sowing of seeds.
10. Potting, repotting, depotting.
11. Pricking of seedlings, pinching, pruning of ornamentals.
12. Arrangement and display of potted plants.

References :

1. Beautiful Gardens Randhwa, M.S. 1950
2. Ornamental Horticulture Randhawa G S
in India
3. Nursery Management Davidson Peterson and Marklenbug

M.Sc. Horticulture and Landscape Management - Semester – II

Core Paper 203: Plantation Crops, Spices and Condiments

Introduction and importance, origin and distribution, classification, varieties, propagation, selection of planting material, climate, soil, planting details, and time of planting, after care, manures and fertilizers of coconut, cashew nut, oilpalm, betelvine, coffee, cacao, arecanut, tea & rubber

And their intercropping, mixed cropping, flowering habits, fruit set, fruit drop, fruit development, maturity, harvesting, processing, grading, marketing, and pest management.

Origin, Importance, export potential, varieties, climate soil requirements, propagation and planting, cultural practices, pest management. Curing and processing practices of Turmeric, ginger, pepper, cinnamon, clove cardamom nutmeg, coriander and cumin.

Practicals:

1. Identification of varieties and descriptive bank for commercial coconut varieties.
2. Identification of varieties and description of casheunut.
3. Varietal description of arecanut.
4. Selection of mother palm and seed nut for propagation in coconut.
5. Visit to commercial farms of plantation crops.
6. Study of growth and bearing habit in cacao.
7. Study of cultural practices for coconut plantations.
8. Botanical description and identification of different spices, condiments and their varieties.
9. Propagation and planting methods in Turmeric and ginger.

10. Visits to farmers fields to study harvesting and post harvest methods of ginger, turmeric.

References:

1. Cacao Wood G A R 1975. Longman, London
2. Spices and Plantation Crops Shanmugavelu K G and Madhava Rao V N 1977. Popular Book Depot, Madras.
3. Cashew Nair M N Bhaslara Rap E V V Nambiar M N and Nambiar M C 1990. CPCRI Kasargod, Kerala.
4. Oil Palm Production Technology Nair M K and Nampoothiri K V K 1996. CPCRI Kasargod, Kerala.
5. Spices and Condiments Pruthi J S 1976. National Book Trust, New Delhi.
6. Spices Vol. I Purseglove J W E G Brown Gren C L and Robbins S R J 1980. Academic Press, New York.
7. Spices Vol. II Purseglove J W E G Brown Gren C L and Robbins S R J 1980. Longman, London.

M.Sc. Horticulture and Landscape Management - Semester – II

Core Paper 204: Green House Management

Importance and scope, production of horticultural crops in greenhouse. Status and development of greenhouse production of horticultural crops. Development, constraints, research needs and future of protected culture of horticultural crops.

Points to be considered before establishing a greenhouse. Greenhouse and related structures location, types, size and arrangement. Types of greenhouse framework, types of greenhouse covering materials. Ventilation and air circulation, greenhouse benches etc. Control of environmental factors influencing the growth i.e. light, temperature (greenhouse heating and cooling) moisture, and relative humidity. Role of growth regulators on the growth and development of greenhouse crops. Canopy management (training and pruning) at different stages of crop growth in different crops.

Prevention and control of insect pests and diseases in different crops. Deficiency symptoms of various nutrients and their management in different crops. Physiological disorders and their management in different crops.

Post harvest handling of green greenhouse horticultural produce. International standards for various horticultural commodities. Export and import codes and procedures for licence in India.

Greenhouse production technology of vegetables & flowers, Greenhouse technology in propagation of Nursery Plants.

Practicals:

1. Study of components of a greenhouse/polyhouse

2. Study of various types of greenhouses
3. Preparation of growth media and sterilization for some important vegetable and flower crops.
4. Scheduling of fertilization for some important vegetables & Scheduling of fertigation for some important flowers.
5. Practicing training and pruning in one or two important cut flower crops.
6. Identification and correction of nutrient deficiencies in important vegetable crops in greenhouse.
7. Identification of nutrient and physiological disorders in some important vegetables and cut flowers in greenhouse.
8. Pre cooling techniques for cut flowers and vegetables.
9. Studies on the control of temperature, relative humidity, carbondioxide and oxygen levels in the greenhouse.

References:

1. Commercial Flower Forcing Alex Laurie B Kiplinger D C and Nelson K S 1979. McGraw Hill Co., New York.
2. Commercial Greenhouse Woodley J W 1981. Ball Publishing, USA.
3. Greenhouse Engineering Aldrich R A and Bartok J W 1990. Ball Publishing, USA.
4. Greenhouse Operation and Management Nelson P V 1991. Ball Publishing, USA.

M.Sc. Horticulture and Landscape Management - Semester – III

Core Paper 301: Ornamental Gardening and Landscape Management

Production technology of seasonals (annuals, biennials) and climbers, Herbaceous borders. Selecting trees for landscape. Planting trees and post planting care. Different tree forms & their phenology. Planting schemes for roadsides.

Various features of garden – paths, garden walls, fencing, steps, edges, hedges, arches, pergolas, shrubbery, groups, Topiary, flower beds, lawn – purposes of lawn, establishing a lawn, plating turf grass. Turf management, turf for athletic purpose.

Garden styles informal and formal, garden designing – Garden environment, basic patterns, choices check list. Principles of garden design, attracting wild life into the garden rockgarden. Home garden. Water garden. Garden operations-deshooting, disbudding & defoliation, staking, mulching, dead heading.

Importance and role of indoor plants on indoor atmosphere. Indoor plants interior scaping. Effect of light, temperature and water on indoor plants. Common problems of indoor plants and their management.

Garden tools and equipment. Maintenance of landscape & garden-watering. Fertilizing, weed control, pruning, & disease and insect pest control. Renovation of garden features – lawn, hedge, tree, climber, shrubs, potted plants.

Practicals:

1. Study of different types of gardens.
2. Identification of garden features.
3. Visit to local parks around the city.
4. Planning and layout of home garden.
5. Layout of lawns.

6. Arches, pergols and water gardens.

References:

1. Ornamental Horticulture in India
Randhawa G S 1973. Today and Tomorrow's Printers and Publishers, New Delhi
2. Gardening in India
Bose T K and Mukherjee D 1977. Oxford & IBH Publishing Co. Pvt. Ltd., Calcutta
3. Planting Designs
Walker D T 1983. PDA Publishers Corporation, USA.
4. Complete Gardening In India.
Iyengar G S 1990. IBH, Banglore.
5. Design Elements of Land Scape Gardening
Nambisan K M P 1992. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

M.Sc. Horticulture and Landscape Management - Semester – III

Core Paper 302: Vegetable Seed Production and Medicinal and Aromatic Plants

Importance and scope of vegetable seed industry in India. Different categories of seed, influence of self and cross pollination, isolation distance and pollinators. Techniques of seed production - annual and biennial habits with reference to seed production in different vegetable crops.

Techniques of large scale hybrid seed production, use of genetic male steriles, marker genes, gynocious lines, hand pollination, emasculation, chemically induced male sterility, field techniques of involving male and female parents for maximization of hybrid seed production.

Seed harvesting, curing, extraction, cleaning, drying, grading, packing, and storage requirement, viability maintenance. Control of seed borne diseases & pests. Economics of seed production & seed certification.

Origin, Importance, export potential, propagation, planting and after care irrigation, training, harvesting, post harvest handling, curing and processing practices, yield and distillation of essential oils of following crops.

Medicinal Plants like Dioscorea, Opium poppy, Rauwolfia, Catharanthus, Belladonna, Ocimum, Solanum khasianum. Aromatic Plants like Citronella, Lemon grass, Palmarosa, Vellivar, mint and vanilla.

Practicals:

- 1) Seed viability tests
- 2) Demonstration of seed extraction methods in tomato Brinjal and Chillies.
- 3) Demonstration of seed extraction methods in warm season vegetables.
- 4) Methods of breaking seed dormancy.

- 5) Botanical description of some medicinal plants.
- 6) Botanical description of some aromatic plants.
- 7) Preparation of herbarium sheets for medicinal and aromatic plants.
- 8) Propagation techniques in aromatic and medicinal plants.

References:

- 1) Medicinal plants Jain S.K 1983, National Book Trust, New Delhi.
- 2) Medicinal plants of India and Pakistan Dastur J F 1982. Taraporevala sons and Co. Pvt. Ltd., Bombay.
- 3) Cultivation and Utilization of medicinal and aromatic plants. Atal E K and Kapur B M 1982, CSIR, New Delhi.
- 4) Vegetables Chowdary B 1967, NBT, New Delhi.
- 5) Tropical Horticulture Bose. T K & Mitra S.K. Naya Prakash, Calcutta.

M.Sc. Horticulture and Landscape Management - Semester – III

Core Paper 303: Plant Growth Regulators and Meteorology

Nomenclature of plant growth substances. Plant growth substances and their classification. Mode of action, movement, mechanism of action and functions of auxins, gibberellins, cytokinins, ethylene, inhibitors, retardants, phenolic substances and morphactins.

Role of plant growth regulators in seed and bud dormancy. Juvenility, maturity and senescence. Photoperiodism and flowering, vernalization and flowering. Fruiting, pollination, fruitset including parthenocarpy, fruit thinning, fruit growth, fruit drop and fruit ripening, (climacteric and non-climacteric) and fruit colour development.

Tuber and bulb formation, nature of the stimulus, tuber and bulb growth, tuber ripening and tuber reutilization. Role of growth regulators in plant propagation, sex expression and extension of shelf life in fruits, vegetables and flowers.

Introduction to meteorology & climatology, practical utility of Agricultural meteorology, weather & climate, types of climate, weather parameters, solar radiation, solar orientation – sun's position, angle of incidence, shadow angles, design of shading devices, temperature, evaporation, wind movement, rain fall and their impact on Horticulture.

Clouds, Introduction and classification of clouds cloud seeding, weather disaster management, weather forecasting & its utility.

Practicals:

1. Calculations of growth regulator requirements for different concentrations and dilutions.
2. Preparation of growth regulators in talc.

3. Hastening fruit ripening by using ethrel
4. Delaying fruit ripening by using GA₃
5. Use of growth regulators in flower crops.
6. Recording of sunshine, atmospheric temperature.
7. Measurement of rainfall and different rain gauges.
8. Visit to the meteorological observatory.

References:

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| 1. | The Control of Growth and Differentiation in Plants. | Wareing P F and Phillips I D J 1970
Pergamon Press Oxford, UK |
| 2. | Plant Growth Substances in Agriculture | Weaver R J 1972. W H Freeman and Co., USA. |
| 3. | Hormonal Regulation of Plant Growth and Development | Purohith S S 1993. Agrobotanical Publishers, Bikaner |
| 4. | Plant Growth and Development | Leopold A C and Kriedemann P E 1975. Tata McGraw Hill publishing Co. Ltd., New Delhi. |
| 5. | Introduction to meteorology | S.Petterson |
| 6. | Meteorology in India | Indian meteorological society |

M.Sc. Horticulture and Landscape Management - Semester – III

Core Paper 304: Biostatistics

(Mathematical derivatives are not required, algorithmic approach only)

Presentation and classification of data, discrete and continuous variables frequency distributions, graphical representation measures of dispersion, mean, median, mode, quartiles, range, quartile deviation, mean deviation, standard deviation.

Concepts of relative measures of dispersion. Correlation Analysis and Regression Analysis. Concepts of Karl Pearson's coefficient of correlation (ungrouped data only) Spearman's Rank correlation coefficient, problems on simple regression.

Elements of probability- definition, classical, relative frequency and axiomatic. Addition rule, multiplication rule, simple problems and probability. Distributions - meaning of discrete and continuous random variable. Concept of expectation binomial, poisson and normal distributions.

Tests of significance; Basic concepts, large sample tests, sampling of attributes, (test for single proportion, list of significance for difference of proportions). Sampling of variables (Test of Significance, for a single mean & difference of mean). Small sample tests - definition of student's distribution test for assumed mean, comparison of means two samples, paired t-test. Definition of chi-square distributions, chi-square test for Goodness of fit and chi-square test for independence of attributes.

Analysis of variance, definition of 'F' distribution, one way, two way. Classification problems, basic concepts of experimental design, CRD, RBD.

Practicals:

1. Methods of central tendency (arithmetic mean, median, mode)
2. Measures of dispersion (standard deviation)
3. Probability theory
4. Problems on Binomial & poisson distribution
5. Problems on Binomial Normal distribution
6. Large sample tests
7. Small sample tests
8. Chisquare tests
9. ANOVA – one way & two way classification
10. Correlation
11. Regression

Reference:

1. A text book of Agricultural Statistics : R. Rangaswamy
2. Biostatistics P.N. Arora & P.K. Malhan,
Himalayan Publishing House,
Mumbai
3. Fundamentals of Statistics S.C.Gupta,
Himalayan Publishing House,
Mumbai
4. An introduction to statistical methods Lyman OH
and data analysis

M.Sc. Horticulture and Landscape Management - Semester – IV

Core Paper 401: Landscape Designs

Introduction to landscape architecture - role of landscape design in architecture. Brief review of landscape and garden design in history in various regions Spanish, French, England, Japanese, and Moghul, Evolution of concepts in landscape design after the industrial revolution.

Landscape Design: a) Site analysis; b) Identification of functional requirements; c) site development by exploiting natural forms; d) Elements in landscape design, land form, water, garden furniture, lights, paving etc., e) study of plant trees, shrubs and ground cover, indoor plants etc. f) study of different species of Indian plants - including flowering plants and field identification.

Urban landscape: Significance of landscape in urban areas. design of parks, playgrounds, landscape planning of individual building projects including roof gardens, Road and highway; Principles and properties of deigned. Landscaping of Historical Monuments and Places of Tourist Importance Elementary landscape construction.

Ecology: Definition of ecology, concept of ecosystem and different kinds of projects on ecosystems, urban hilly and coastal areas. Study of air, water and noise pollution. Measures for prevention and mitigation. Legal provision for control of pollution precaution of environmental impact statement.

Practicals:

1. Soil testing & Amendments.
2. Identification of garden furnitures like garden seats, lights, pavements etc.
3. Study of garden furnitures like garden seats, lights, pavements etc.
4. Identification of trees, shrubs, ground covers & indoor plants.

5. Layout of parks.
6. Layout of play grounds.
7. Landscaping historical monuments.
8. Landscaping places of tourist importance.
9. Identification of functional areas.

References :

1. Landscape Design Michel Lorry
2. The Art of Home Eckbo, G. 1956.
Landscaping
3. Beautiful Gardens Randhwa, M.S. 1950
4. Flowering Trees Randhwa, M.S. 1983

5. The ultimate planting Neol Kings bury, 1997.
guide
6. Ecology Engine P.Odum

M.Sc. Horticulture and Landscape Management - Semester – IV

Core Paper 402: Recent Advances in Horticulture

Apiculture, bee-keeping flora in India, bee-keeping technology, equipment ,
Honey extraction – Mushroom production nutritional aspects, receipies.

Watershed management objectives, approaches, steps in watershed
development.

Importance and principles of organic farming, sources and importance of
organic matter. Organic mulches weed control in organic farming, organic pest
control. Composting, principles of composting, vermiculture, vermicomposting &
vermi wash, coirpith manure.

Bonsai – Suitable plants for Bonsai; Aesthetics with plant parks,
classification of Bonsai, requirements of Bonsai pot, Training and pruning, potting
& repotting, general care. Terrarium culture.

Flower arrangement – Ikabana & western trend, Principles of flower
arrangement, tools & equipment, dehydrated flowers, dehydration methods,
maintenance of flowershape, procedure for embedding, pot –pourri.

Flower show and garden competitions.

Watershed management objectives, approaches, steps in watershed
development

Practicals:

1. Flower arrangement in different styles.
2. Preparation of bouquets.
3. Visit to the local florist.
4. Terrarium culture.
5. Herb pot planting.

M.Sc. Horticulture and Landscape Management - Semester – IV

Core Paper 403: Preservation of Fruits and Vegetables

Importance and scope of fruit and vegetable preservation in India. Principles of preservation by heat, low temperature, chemicals, methods of preservation.

Unit Layout – selection of site, precautions for hygienic conditions of the unit. Preservation through canning, bottling, freezing, dehydration, drying, ultraviolet and ionizing radiations.

Micro-organisms associated with spoilage of fruit and vegetable products. Spoilage of canned products, hydrogen swell, swell, flipper, dent, leaker etc., Biochemical changes associated with spoilage.

Preservatives, colours, permitted and prohibited in India. Different kinds of equipments used in processing.

Preparation of jams, jellies, marmalades, candies, crystallised and glazed fruits, preserves, chutneys, pickles, ketchup, sauce, puree, syrups, juices, squashes and cordials.

Practicals:

1. Identification of equipment and machinery used in preservation of fruits and vegetables
2. Preparation of jam
3. Preparation of jelly
4. Preparation of squash
5. Preparation of syrups
6. Preparation of chutneys
7. Preparation of pickles
8. Preparation of puree
9. Visit to local processing units

References:

1. Commercial Fruits and Vegetable Products
Crues W V 1948. McGraw Hill Book Co., London
2. The Technology of Food Preservation
Desrosier N W 1959. AVI Publishing Co., Inc., Connecticut, USA
3. The Biochemistry of Fruits and their Products
Hulme A C 1970. Academic Press, London
4. Preservation of Fruits and Vegetables
Lal G Siddappa G S and Tadon N G L 1986. ICAR, New Delhi.

M.Sc. Horticulture and Landscape Management - Semester – IV

Core Paper 404: Post Harvest Technology of Horticultural Crops and Marketing Strategies

Importance of post harvest technology in horticultural crops, maturity indices, harvesting and handling of fruits, vegetables and cut flowers. Maturity and ripening process.

Factors affecting ripening of fruit. Preharvest factors affecting quality. Application of hormones, fungicides and other chemicals.

Irrigation schedules factors responsible for deterioration of harvested fruits and vegetables. Respiration and transpiration, chemicals used for hastening and delayed ripening.

Methods of storage, precooling, prestorage treatment. Low temperature storage, controlled atmospheric storage, hypobaric storage, irradiation. Low cost storage structures.

Various methods of packing, packaging materials and transport. Packing technology for export, fabrication of types of containers, cushioning material. Vacuum packing, poly shrink, packing, specific packing for export of mango, banana, grapes, cut flowers and ornamental plants.

Practicals:

1. Practices in judging the maturity of various fruits, and flowers.
2. Practices in judging the maturity of various vegetables in that particular season.
3. Sensory evaluation of fruits.
4. Sensory evaluation of vegetables
5. Determination of physiological loss in weight, and total soluble solids (TSS)

6. Packing methods and types of packing and importance of ventilation.
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