

Floriculture Lab



DEPARTMENT OF FLORICULTURE AND LANDSCAPE ARCHITECTURE

Course No.- H/FL-242

Course title:- Ornamental Horticulture

Credit hours: (2+1) 3

Semester- IV

Theory- History, definitions, scope of ornamental horticulture, aesthetic values, Floriculture industry, Importance, area and production, industrial importance of ornamental plants and flowers. Importance, classification, design values and general cultivation aspects for ornamental plants viz. Annuals, biennales herbaceous perennials, grasses and bulbous ornamentals. shrubs, climbers, trees, indoor plants, palms and cycads, ferns and sellagenellas, cacti and succulents, Importance, design and establishment of garden features/components viz. hedge, edge, borders, flower beds, bridges, paths, drives, fences, garden walls, gates, carpet bed, arbour, Patio, decking, retaining walls, shade garden, sunken garden, roof garden, terrace garden, pebble garden, rockery, pools, waterfalls, fountains, bog garden, avenue planting and children garden. Lawn types, establishment and maintenance. Importance of Garden adornments viz. floral clock, bird bath, statutes, sculptures, lanterns, water basins, garden benches etc. Importance of flower arrangement, Ikebana, techniques, types, suitable flowers and cut foliage, uses of vertical garden, bottle garden, terrariums, art of making bonsai, culture of bonsai and maintenance.

Practical- Identification and description of annuals, biennials, herbaceous perennials, climbers, shrubs, trees, indoor plants, ferns and sellagenellas, Palms and cycads and Cacti and succulents. Planning and designing and establishment of garden features viz. lawn, hedge and edge, rockery, water garden, carpet bedding, shade garden, roof garden, Study and creation of terrariums, vertical garden, study and practice of different types of flower arrangements, preparation of floral bouquets, preparation of floral rangoli, veni etc., Study of Bonsai techniques, Bonsai practicing and training. Visit to nurseries and floriculture units.

Lesson/Course Plan

Lecture No.	Topics	Weightage (%)
1	History, Definition, scope of gardening Aesthetic values	4
2-3	Types of gardens in India.	8
4	Floriculture industry: importance, area and production, industrial importance in India	4
5-6	Landscaping, basic principles and basic components.	4
7-8	Principles of gardening, Garden components & adornments	8
9	Lawn making	8
10	methods of designing rockery and water garden	4
11-13	Special types of gardens, trees, their design, their walk-paths, bridges, constructed features	8
14	Garden structures –Greenhouse, Glass house, Net house	4
15	Values in landscaping	4
16-18	Propagation-planting shrubs and herbaceous perennials	8
19-20	Importance, design values, propagation, planting, climbers, creepers	4
21-22	Importance, design values, propagation, planting, palms and ferns.	4
23-24	Importance, design values, propagation, planting, grasses, cacti succulents.	4
25-26	cultural operations in ornamental plants	4
27-28	Bio-aesthetic planning, definition, need, Round country planning, Urban planning & Planting avenues, schools, villages.	4

29	Beautifying railway stations, dam sites, hydroelectric stations, colonies, river banks, Planting material for play grounds.	4
30	Vertical gardens, Roof gardens	4
31	Culture of bonsai, art of making bonsai.	4
32	Recommandations of Joint Agresco	4
Total		100

Practical programme

Practical No.	Topics
1	Identification and description of annuals, herbaceous, perennials.
2	Identification and description of climbers, creepers, foliage flowering shrubs
3	Identification and description of trees, palms, ferns.
4	Identification and description of ornamental grasses; cacti succulents.
5	Planning and designing gardens-Formal
6	Planning and designing gardens- Informal
7	Functional uses of plants in the landscape
8	Planning design of house garden, roadside planting, avenues for new colonies, traffic islands
9	Preparation of land for lawn and planting.
10	Maintenance of Lawn
11	Description and design of garden structures
12	Layout of rockery, terrace garden, Japanese gardens and water garden
13	Layout of recreational and children's corner, terrarium,
14	Layout of traffic islands, bottle garden, dish garden.
15	Flower arrangement practices
16	Bonsai practicing and training

Suggested Reading:**Reference Books:**

- Arora, J.S. 2006. Introductory Ornamental Horticulture. Kalyani Publishers, Ludhiana
- Bimaldas Chowdhury and Balai Lal Jana.2014.Flowering Garden trees. Pointer publishers, Jaipur. India.
- Bose, Chowdhury and Sharma.1991.Tropical Garden Plants in colour .Horticulture and allied publishers, 3D Madhab Chatterjee street Kolkata.
- Bose, T.K. Mukherjee, D. 2004. Gardening in India. Oxford & IBH Publishers.
- Chadha, K.L. and Chaudhary, B. 1986. Ornamental Horticulture in India. Publication and Information division. ICAR, New Delhi.
- K.V.Peter.2009.Ornamental plants. New India publishing agency, Pitampura, New Delhi.
- Randhawa, G.S. Amitabha Mukhopadhyay, 2004. Floriculture in India. Allied Publishers Pvt. Ltd., New Delhi.
- Richard Bird. 2002. Flowering trees and shrubs. Printed in Singapore by Star Standard Industries pvt. Ltd.

e-reading: <http://ecourses.iasri.res.in/>

Course No.- H/FL-364 Title:- Breeding and seed production of ornamental crops Credit hours: 3(2+1) Semester- VI

Theory-History of improvements of ornamental plants, scope and importance of breeding of ornamental crops. Centre of origin of flower crops and ornamental crops, objectives and techniques in ornamental plant breeding. Introduction, selection, hybridization, mutation and biotechnological technique for improvement of ornamental and flower crops viz., rose, jasmine, chrysanthemum, tuberose, gerbera, gladiolus, dahlia heliconia, liliium, gaillardia, petunia, hibiscus, bouganvillea, zinnia, cosmos, dianthus, snapdragon, pansy, crossandra, marigold, geranium, antirrhinium, china aster, orchids, anthurium, carnation, etc. Breeding for disease resistance. Development of promising cultivars of important ornamentals and flower crops. Role of heterosis and its exploitation, production of F1 hybrids and utilization of male sterility, production of open pollinated seed. Harvesting, processing and storage of seeds, seed certification.

Practical: Study of floral biology and pollination in important species and cultivars. Techniques of inducing polyploidy and mutation. Production of pure and hybrid seeds. Harvesting, conditioning and testing of seeds. Practice in seed production methods.

Lesson/Course Plan- Theory

Lecture No.	Topics	Weightage (%)
1-2	History of improvements of ornamental plants Scope and importance of breeding of ornamental crops.	8
3-4	Objectives and techniques in ornamental plant breeding	8
	Introduction, selection, hybridization, mutation and biotechnological technique for improvement of ornamental and flower crops viz.	
5-7	Rose	8
8-10	Jasmine, Hibiscus, Bouganvillea	8
11-16	Chrysanthemum, Gerbera, China Aster, Gaillardia, Dehlia, Zinnia, Carnation, Marigold, Cosmos	10
17-19	Tuberose, Gladiolus, Liliium,	8
20-21	Orchid, Anthurium, Heliconia, Antirrhinium,	8
22-23	Petunia, Dianthus, Snapdragon, Pansy, Crossandra, Geranium	4
24	Breeding for disease resistance.	4
25-26	Development of promising cultivars of important ornamentals and flower crops.	4
27	Role of heterosis and its exploitation	8
28	Production of F1 hybrids and utilization of male sterility	8
29	Production of open pollinated seed.	8
30	Harvesting processing and storage of seeds	
31	Seed certification.	3
32	Recommendations of Joint Agresco	3
Total		100

Practical programme

Practical No.	Topics
1	Acquaintance with breeding tools for floricultural crops
2	Methods of emasculation and pollination, selfing

3	Study of floral biology and pollination of rose, jasmine, chrysanthemum, tuberose
4	Study of floral biology and pollination of gerbera, gladiolus, dahlia heliconia, liliium, gaillardia
5	Study of floral biology and pollination of petunia, hibiscus, bouganvillea, zinnia, cosmos
6	Study of floral biology and pollination of dianthus, snapdragon, pansy, crossandra, marigold, geranium
7	Study of floral biology and pollination of china aster, orchids, anthurium, carnation
8	Techniques of inducing polyploidy and mutation.
9	Production of pure and hybrid seeds rose, jasmine, chrysanthemum, tuberose
10	Production of pure and hybrid seeds gerbera, gladiolus, dahlia heliconia, liliium, gaillardia
11	Production of pure and hybrid seeds petunia, hibiscus, bouganvillea, zinnia, cosmos
12	Production of pure and hybrid seeds china aster, orchids, anthurium, carnation
13	Harvesting, conditioning and testing of seeds
14	Harvesting, conditioning and testing of seeds
15	Practice in seed production methods.
16	Practice in seed production methods.

Suggested Reading:

Reference Books:

Agarwal, P. K 1994. Principles of Seed Technology. ICAR Publication,

NewDelhi. Agarwal, R. L. 1996. Seed Technology.

Oxford&IBHPublishers, New Delhi.

Bhattacharjee, S.K. and L.C. De. 2003. *Advanced Commercial Floriculture*. Aavishkar Publishers, Distributors, Jaipur (Rajasthan) India.

Bose, T. K., L.P. Yadav, P. Patil, P. Das and V.A. Partha Sarthy. 2003. *Commercial flowers*. Partha Sankar Basu, Nayaudyog, 206, Bidhan Sarani, Kolkata-700006.

Callaway D.J. and M.B. Callaway. 2000. *Breeding Ornamental Plants*. Timber Press.

Harding, J., F.Singh and J.N. Mol. 1991. *Genetics and Breeding of Ornamental Species*. Springer Publishers.

Pal, B. P. 1966. *The Rose in India*. Directorate of Knowledge management in Agriculture, Indian council of Agriculture Research-New Delhi.

Singh, B. D. 1983. *Breeding Principles and Methods*. KalyaniPublishers,New Delhi.

Vainstein, A. 2002. *Breeding for Ornamental: Classical and Molecular*

Approaches. Springer Publishers.

e-reading: <http://ecourses.iasri.res.in/>

Course No.- H/ FL –353

Course title:- Principles of Landscape Architecture

Credit hours: (0+1)1

Semester- V

Practical- Study of garden equipments. Study of Graphic language, Use of drawing equipments, graphic symbols and notations in landscaping designing, Study and designing of different styles of gardens, Study and designing of gardens based on different themes, Designing gardens using Auto-cad/ archi-cad, Designing gardens for home, traffic islands, schools and colleges, public buildings, factories, railway stations, air ports, temples, churches, play grounds, corporate buildings/ malls. Designing and planting of avenues for state and National highways, Design and establishment of Japanese, English and Mughal gardens. Visit to public, institutional and botanical gardens.

Practicals programme

Practical No.	Topics
1	Identifications of Plant materials for landscaping
2	Planning, designing and layout of formal gardens
3	Planning, designing and layout of formal gardens
4	Planning, designing and layout of informal gardens
5	Planning, designing and layout of informal gardens
6	Planning, designing and layout special gardens.
7	Planning, designing and layout special gardens.
8	Planning, designing and layout special gardens.
9	Symbols, tools, implements use in landscape designing.
10	Symbols, tools, implements use in landscape designing.
11	Maintenance and repairs of potted plants
12	Planting of Lawn by different methods
13	Maintenance of Lawn
14	Landscape design for specific areas-Schools, Churches, Highway
15	Landscape design for specific areas- Public places, Temples, railway Station
16	Visit to Landscape gardens.

Suggested Reading:

Reference Books:

A.K. Tiwari and R. Kumar. 2012. *Fundamentals of ornamental horticulture and landscape gardening*. New India.

Arora, J.S. 2006. Kalyani publishers, Ludhiana. *Introductory Ornamental Horticulture*. Kalyani publishers, Ludhiana.

Bose, T.K. Malti, R.G. Dhua, R.S. & Das, P. 2004. Nayaprakash, Calcutta.

Floriculture and Landscaping
H.S.Grewal and Parminder Singh. 2014. *Landscape designing and ornamental plants*

L.C. De. *Nursery and landscaping*.2013. Pointer publishers, Jaipur India.

R.K. Roy. *Fundamentals of Garden designing*.2013.New India publishing agency, Pitampura, New Delhi.

Rajesh Srivastava. 2014. *Fundamentals of Garden designing*. Agrotech press, Jaipur, New Delhi.

Randhawa, G.S. and Amitabha Mukhopadhyay 2004. Floriculture in India. Allied Publishers Pvt. Ltd., New Delhi.

e-reading: <http://ecourses.iasri.res.in/>

Course No. - H/FL-231

Course title-Commercial Floriculture

Credits hours: (2+1) 3

Semester – III

Theory-Scope and importance of commercial floriculture in India,Production techniques of ornamental plants for domestic and export market for following flower crops,Rose,Marigold, Chrysanthemum,Anthurium, Gladiolus,Jasmine,Dahlia,Tuberose,Bird of Paradise,China Aster, gaillardia , Gerbera,Orchid,Crossandra, Growing of flowers under protected environments such as glass house, plastic house, net house, etc.,Post harvest technology of cut and loose flowers in respect of commercial flower crops,Dehydration techniques for drying of flowers, scope importance and status,Production techniques for bulbous crops

Practical-Identification of commercially important floricultural crops, Propagation technique in gladiolus, carnation, chrysanthemum and tuberose, Sowing of seeds and raising of seedlings of annuals, Propagation of ornamental plants with particular reference to cottage, layerage and budding, Training and pruning of roses, Drying and preservation of flowers, Use of chemicals and other compounds for prolonging the vase life of cut flowers, Flower arrangement practices.

Lesson/Course plan - Theory

Lecture No.	Particulars	Weighthages (%)
1-2	Scope and importance of commercial floriculture in India	8
	Production techniques of ornamental plants for domestic and export market for following flower crops	
3-4	Rose	8
5	Chrysanthemum	8
6-7	Anthurium and Orchid	8
8-9	Carnation and Gerbera	8

10-11	Gladiolus and Tuberose	8
12-13	Jasmine	8
14	Dahlia	8
15-18	Marigold, Crossandra, Gaillardia and China Aster	4
19-21	Michelia, Heliconia and Bird of Paradise	4
22	Domestic and export marketing of flowers.	4
23-25	Growing of flowering plants under protected environments such as glass house, plastic house, net house, etc.	4
26-27	Post-harvest technology of cut and loose flowers in respect of commercial flower crops.	8
28-29	Dehydration techniques for drying of flowers, scope importance and status	4
30-31	Production techniques for liliun,canna, spider lily, etc.	4
32	Recommendations of Joint Agresco	4
Total		100

Practical Schedule

Practical No.	Particulars
1	Identification of commercially important floricultural crops.
2	Propagation technique in gladiolus, carnation.
3	Propagation technique in chrysanthemum and tuberose.
4	Sowing of seeds and raising of seedlings of annuals.
5	Sowing of seeds and raising of seedlings of annuals.
6	Propagation of ornamental plants with particular reference to cutting
7	Propagation of ornamental plants with particular reference to layering
8	Propagation of ornamental plants with particular reference to budding
9	Training and pruning of roses.
10	Drying and preservation of flowers.
11	Intercultural operations
12	Intercultural operations
13	Use of chemicals and other compounds for prolonging the vase life of cut flowers.
14	Flower arrangement practices.
15	Preparation of garland, veni and gajara.
16	Visit to commercial floriculture unit

Suggested Reading:

Reference Books:

A.K.Singh.2006.*Flower crops, cultivation and management*. New India publishing agency, Pitampura, New Delhi.

Arora, J.S. 2006. *Introductory Ornamental Horticulture*. Kalyani Publishers, Ludhiana - 141 008.

Bhattacharjee, S.K. *Advanced Commercial Floriculture*. Aavishkar Publishers Distributors, Jaipur - 320 003

Dewasish Choudhary and Amal Mehta. 2010. *Flower crops cultivation and management*. Oxford book company Jaipur, India.

Randhawa, G.S. Amitabha Mukhopadhyay, 2004. *Floriculture in India*. Allied Publishers Pvt. Ltd:

S.K. Bhattacharjee and L.C. De. 2003. *Advanced Commercial Floriculture*. Aavishkar Publishers, Distributors, Jaipur (Rajasthan) India.

T.K. Bose, L.P. Yadav, P. Patil, P. Das and V.A. Partha Sarthy. 2003. *Commercial flowers*. Partha Sankar Basu, Nayaudyog, 206, Bidhan Sarani, Kolkata-700006

V.L. Sheela, 2008. *Flower for trade*. New India Publishing Agency, Pitampura, New Delhi-11008

e-reading: <http://ecourses.iasri.res.in/>