

1st Semester

M. Sc. (Ag.) Horticulture (Floriculture & Landscaping)

S. No.	Course Title	Course Code	Credits
1.	Ornamental Horticulture	HORT – 704	2 – 0 – 2 = 3
2.	Landscape Gardening - I	HORT – 705	2 – 0 – 2 = 3

Basic Supporting Courses

S. No.	Course Title	Course Code	Credits
3.	Statistics – I	MAS 711	2 – 0 – 2 = 3
4.	Research Methodology	ECON – 705	2 – 0 – 4 = 4
5.	Computer Orientation	COMP – 705	2 – 0 – 2 = 3

2nd Semester

M. Sc. (Ag.) Horticulture (Floriculture & Landscaping)

S. No.	Course Title	Course Code	Credits
6.	Commercial Floriculture	HORT – 714	2 – 0 – 2 = 3
7.	Medicinal and Aromatic Plants	HORT – 715	2 – 0 – 4 = 4
8.	Plant Growth Regulators in Horticulture	HORT – 709	2 – 0 – 2 = 3
9.	*Protected Cultivation of Commercial Flowers	HORT – 716	2 – 0 – 2 = 3

Basic Supporting Courses (Compulsory for all the Branches)

S. No.	Course Title	Course Code	Credits
10.	Statistics – II	BSH - 617	2 – 0 – 2 = 3

* Optional Subjects

3rd Semester

M. Sc. (Ag.) Horticulture (Floriculture & Landscaping)

S. No.	Course Title	Course Code	Credits
11.	Taxonomy and Breeding of Horticultural Crops	HORT - 801	3 – 0 – 4 = 5
12.	Landscape Gardening – II	HORT – 809	2 – 0 – 4 = 4
13.	*Prolonging the Shelf Life of Cut Flowers	HORT – 810	2 – 0 – 2 = 3
14.	*Plant Growth Regulators in Commercial Production of Flowers	HORT – 811	2 – 0 – 2 = 3
15.	Seminar	HORT – 780	2 – 0 – 2 = 3

* Optional Subjects

4th Semester

M. Sc. (Ag.) Horticulture (Floriculture & Landscaping)

S. No.	Course Title	Course Code	Credits
16.	Thesis / Research	HORT - 899	0 – 0 – 30 = 15

Semester 1st

HORT – 704 Ornamental Horticulture 3(2-0-2)

Importance, description, cultivation and use of annuals; biennials, herbaceous perennials, woody perennials and bulbous plants. Identification, classification and growth habits of ornamental trees, shrubs and climbers used for various purposes. Cacti and succulants, ferns, palms and foliage plants.

Bonsai – care and maintenance. Flower shows, judging. Flower arrangements. Growing of flowers for exhibitions and competitions.

Practical:

1. Identification, classification and description of annuals, herbaceous perennials, bulbous plants, cacti and succulents, foliage plants, ferns and palms.
2. Bonsai culture and flower arrangements.
3. Visit to nurseries and gardens.

HORT – 705 Landscape Gardening - I 3(2-0-2)

Theory:

Early history, principles of landscape gardening, designing landscapes, basic style, formal – informal, tree style- mogul garden, garden in hills, plains, botanical garden, garden, park, small home, school and industrial gardens, road side gardens – highways, dams, roof garden, balcony garden, terrariums, Japanese garden, bonsai – conceptual basis, types and styles, plant and other materials, decoration, materials and methods of drying. Management of light, humidity, watering, maintenance of pot plants and indoor plants.

Practical:

Identification of garden components, lawn, annuals, shrubs, climbers, creepers, cactus, succulents, trees with specialized gardens, line roof garden, Japanese garden.

MAS – 711 Statistics – I

3(2-0-2)

Statistical Methods: Measures of Skewness and Kurtosis standard error of mean, Coefficient of variation.

Theory of Probability: Definitions, Additions and Multiplication rules of Probability, Conditional probability.

Probability distributions: Normal, Binomial and Poisson distribution.

Correlation and Regression: Simple correlation, Rank correlation, Regression Coefficient, Multiple and Partial Correlation, Regression lines between two variables, Multiple Regression.

Tests of Significance:

χ^2 – test

T – Test: one sample two sample t – tests, paired t – test.

Testing of Correlation Coefficient, Standard normal variable test.

F – test:

Fisher's 2 – transformation

Practical:

Coefficient of variation, SE of mean, Skewness and Kurtosis

Fitting of Normal, Binomial and Poisson distribution.

Simple Correlation, Multiple and Partial Correlation with three variables
only

Regression lines between two variables

χ^2 , t and F – tests

ECON – 705 Research Methodology

4(2-0-4)

Theory:

Definition of Science and Scientific research; Classification of research; special features of social science research, Inductive and deductive research; steps involved in scientific investigation; identification of research problem, formulation of hypothesis; Review of literature, sampling procedure, Preparation of schedules and questionnaire, data collection analysis and inferences and reporting of the result.

Practical:

Each student will select a few problems in his area of specialization and one problem will be selected for detailed development in the form of research project including preparation of questionnaire and schedules.

COMP – 705 Computer Orientation

3(2-0-2)

Introduction to multi programming and time sharing computers. Login and creation of files. Introduction of structured programming with reference to BASIC. Variables and constants, complex, double precision, logical, character. Arithmetic expressions, arrays, control statements (DO, IF, Computed, OTO). Functions and subroutines. I/O statements. Elementary programming of algorithms.

Semester 2nd

HORT – 714 Commercial Floriculture

3(2-0-2)

Theory:

Introduction, importance and scope of commercial floriculture in India. Origin, classification, description, cultivation, nutrition, harvesting, grading, storing, packing, marketing, and economics of commercially important flower crops like rose, orchid, jasmine, gladiolus, marigold, carnation, chrysanthemum and tulip. Role of growth regulators in commercial flower crops. Prolonging the shelf life of cut flowers. Production of container grown ornamentals.

Practical:

- Identification and classification of important commercial flower crops.
- Prolonging the vase life of cut flowers.
- Studies on harvesting, grading packing and storage of commercially important flower crops.
- Survey of different cut flower markets.
- Visit to nurseries and commercial growers.

HORT – 715 Medicinal and Aromatic plants

4(2-0-4)

Theory:

History, scope opportunities and constraints in the cultivation and maintenance of medicinal and aromatic plants in India. Origin, distribution, area, production, climatic and soil requirements, propagation and nursery techniques, planting and after care, cultural practices, training and pruning , nutritional and water requirement, plant protection, harvest and processing of medicinal and aromatic plants, study of chemical composition of a few important medicinal and aromatic plants, extraction, use and economic of drugs

and essential oils in medicinal and aromatic plants, therapeutic and pharmaceutical uses of important species.

Medicinal Plants: Betelvine, Periwinkle, Ravolfia, Dioscorea, Isabgol, Ammimajus, Belladonna, Chicnhona, Pyrethrum, Safed Musli, Senna, Ashwagantha, Isabel, Klamegh, Sapargantha, Ocimum.

Aromatic Plants: Citronella grass, Khus grass, Fly (baje), Geranium, Patchonli, mint geranium, Vetiver, Jasmine, chetirose.

Practical:

Collection of medicinal and aromatic plants for their natural habitual and study their morphological description nursery techniques, Harvesting curing and processing techniques and extraction essential oils.

HORT – 709 PGR's in Horticulture.

3(2-0-2)

Theory:

History, extraction, bioassay, biosynthesis, structure, role of PGR,s, mode of action, metabolic and morphogenic effect of auxins, gibberellins, cytokinisis, ethylene, growth inhibitors, growth reatdants, morphactins and their applications in horticulture.

Practical:

Bioassay for indigenously produced plant growth substances.

Application of plant growth substances in prevention of fruit drop, sex expression, fruit set, induction of parthenocarpy, fruit thinning, fruit ripening and shelf life of fruits.

Use of growth regulators as herbicides.

***HORT – 716 Protected Cultivation of Commercial
Flowers***

3(2-0-2)

Theory:

- ☞ Introduction of protected cultivation.
 - Scenario of protected cultivation.
 - Scope and constraints of protected cultivation in India.
 - Why protected cultivation?
- ☞ Basic consideration in establishing and operation of green house production.
- ☞ Type of Green houses.
- ☞ Media for green house crops.

- ☞ Recent techniques of protected cultivation of cut flowers.
- ☞ Nutrient solutions for growth media.
- ☞ Technical control of the nutrient solution.
- ☞ Carbon dioxide fertilization.
- ☞ Mineral nutrients and fertilization for Green house crops.
- ☞ Chemical growth regulation of Green house crops.
- ☞ Important disease and pest problems in Green house crops and their control.
- ☞ Protected cultivation of some important cut flower Rose, Carnation, Gerbera.

Practical:

- ☞ Visit to commercial units for cut flowers.
- ☞ Identifications of different growth media used in Green House.
- ☞ Studies on the post harvest, grading and packing of important commercial cut flowers.

BSH – 617 Statistics – II (Design of Experiment and analysis of variance) 3(2-0-2)

Analysis of variance: Definition and assumptions, one way classification, two way classification.

Sampling Techniques: Simple random sampling, stratified random sampling, systematic sampling.

Design Experiments : Randomized block design, Latin square design, Factorial design, (2^2 , 2^3 , 3^2 , 3^3 factorials), some $p \times q$ factorial experiments, Split Plot Experiments. Balanced incomplete Block design.

Practical:

Analysis variance, Randomized block design.

Semester 3rd

HORT – 801 Taxonomy and Breeding of Horticultural Crops 5(3-0-4)

- ☞ Different types of classification. Classification of important Horticultural crops.
- ☞ Floral biology of important families. Introduction, history and scope of vegetable breeding.
- ☞ Center of origin and their role in crop improvement. Breeding systems in vegetable crops.
- ☞ Breeding methods in self and cross pollinated vegetables.
- ☞ Inbreeding depressing & heterosis breeding in vegetables.
- ☞ F₁ hybrid seed production. Distant Hybridization.
- ☞ Role of mutation and polyploidy in vegetable improvement.
- ☞ Breeding for disease, insect-pest and nematode resistance.
- ☞ Breeding for tolerance to moisture, heat, cold, salt and air pollution.
- ☞ Breeding for processing and quality. Problems and prospects of fruit breeding in comparison to cereal crops.
- ☞ Different methods of improvement of fruit crop such as introduction, selection, hybridization, polyploidy and mutation breeding.
- ☞ Pollination and incompatibility systems. Specific breeding problems and results achieved in important fruit crops like mango, citrus, grape, banana, strawberry, papaya, pome and stone fruits and floriculture.

Practical:

- ☞ Study of floral biology and pollen viability. Techniques of crossing and selfing.
- ☞ Identification of genetic male sterile and incompatible plants.
- ☞ Demonstration of hybrid vigour. Screening procedure for insect-pest and disease resistance and for tolerance to environmental stress.
- ☞ Methods of inducing mutation and polyploidy.
- ☞ Anthesis, dehiscence and fruit set in different fruit crops, handling of new introductions, exercise on hybridization, polyploidy and mutation breeding techniques and handling of their generations.

HORT – 809 Landscape Gardening – II

4(2-0-4)

Theory:

History of developments of garden, Landscape gardening, Styles of gardening, Principles of garden design, Selection of trees and annuals for landscape, Climbers, Creepers, Shrubs in landscape, Bulbous plants for landscape, The rock garden, summer house, road side garden, highway, planting hydroelectric project, dams, public corner in gardens, interior landscape, lawn and lawn establishment, avenue trees for landscape, noise pollution, parks.

Practical:

Identification of garden plants, specimen plants used for different location, lawn, beds, shrubs, climbers, creepers, Specialized garden like aquarium, roof terrace, Japanese garden, landscape components, lawn, shrubs, ornamental hedges and edges, statues.

HORT – 810 Prolonging the Shelf Life of Cut Flowers ***3(2-0-2)***

Theory:

Important cut flowers and post harvest requirements, senescence and post harvest physiology of cut flowers, pre-harvest factors, harvest factors, post-harvest factors, treatments for improving longevity of cut and loose flowers, role of chemical preservatives on keeping quality of cut flowers, post harvest technologies of important cut flowers.

Practical:

Storage of cut flowers, cold storage, dry storage, CAS, low pressure storage, modified atmosphere storage (MA), grading, packaging, packing boxes, special care for exotic flowers.

HORT – 811 Plant Growth Regulators in Commercial ***Production of Flowers*** ***3(2-0-2)***

Theory:

Role of auxin, gibberellins, cytokinin, ABA, ethylene in flower crops. Application of plant growth regulators in rose, chrysanthemum, gladiolus, tuberose, marigold, carnation, orchids, corm, bulb, cuttings, seed treatments in ornamental and commercial flower crops. Application of micro and macro propagation of commercial flower crops. Application of PGR's in pre & post harvest studies for commercial flowers.

Practical:

- ☞ Application techniques of growth regulators and their duration.
- ☞ Seed treatment with growth regulators and chemical stimulants.
- ☞ Foliar, seed treatment in PGR's for ornamental and commercial flowers.

HORT – 780

Seminar

3(2-0-2)

4th Semester

HORT – 899

Seminar

15(0-0-30)