

**KURUKSHETRA UNIVERSITY**  
**DEPARTMENT OF BOTANY**

**P.G. DIPLOMA IN FLORICULTURE**  
**(ANNUAL SYSTEM)**

**Learning Outcome:** The diploma holders of floriculture will be capable to combat the challenges in the field of growing the ornamental plants, selecting the genotypes of improved characters and their propagation/management under controlled environmental conditions. Students will also be well versed in post-harvest management, marketing and value addition of commercial ornamental plants.

**SCHEME OF EXAMINATION w.e.f. session 2020-21 under CBS**

<b>Code</b>	<b>Nomenclature</b>	<b>Duration</b>	<b>Max.Marks+I.S</b>	<b>Credit</b>	<b>Hrs/Week</b>
<b>Theory Papers</b>					
<b>PGDF-101</b>	Essentials of Floriculture	3 Hrs.	80 + 20	4	4
<b>PGDF-102</b>	Improvement of Ornamental Plants	3 Hrs.	80 + 20	4	4
<b>PGDF-103</b>	Seed Production and Micro-Propagation	3 Hrs.	80 + 20	4	4
<b>PGDF-104</b>	Agro technology and Marketing	3 Hrs.	80 + 20	4	4
<b>Practical Papers</b>					
<b>PGDF-105</b>	Based on Paper PGDF-101 & 102	4 Hrs.	80 + 20	4	4
<b>PGDF-106</b>	Based on Paper PGDF-103 & 104	4 Hrs.	80 + 20	4	4
<b>PGDF-107</b>	Project work		25	1	
<b>Total</b>			<b>625</b>	<b>25 Credit</b>	

## SYLLABUS

**PGDF-101 Essentials of Floriculture**

**IA: 20**

**Max. Marks: 80 (Theory),**

**Duration: 3 hours Credit-4**

### **Learning Outcome:**

**CO1** Students will be able to identify the different plant varieties and their nutritional/soil type requirement as well as their management in nurseries and green houses.

**CO2** Learners will be capable to measure soil fertility and apply soil fertility management for improvement of soil structure and its richness.

**CO3** Students will learn about various tools and ornamental exhibits used in floriculture.

**CO4** Students will be trained in environment control and management strategies of floriculture.

**Note: Nine question will be set in all. Question No. 1 will be compulsory and short answer type covering the entire syllabus. Remaining eight questions will be set unit-wise and four questions from each unit. The candidates will be required to attempt Question no. 1 and four more selecting two questions from each unit. All questions carry equal marks.**

### **UNIT-1**

1. History and scope of Floriculture
2. Layout structure and management of nursery.
3. Green House Plants.
4. Types and varieties of Dahlia, Chrysanthemum, Gladiolus and Bougainvillea.
5. Cultivation of cacti, succulents, orchids, and water plants.
6. Prolonging the vase life of flowers.

### **UNIT-2**

1. Importance and types of house plants.
2. Effects of factors light, temperature, mineral nutrients, fertilizers, integrated nutrient use.
3. Soil formation, soil structure, soil characteristics and soil fertility assessment.
4. Plant care, training, diseases, pests, control measures.
5. Mycorrhiza and soil fertility management.
6. Methods of growing indoor plants, containers for house plants, dish garden, terrarium, hanging basket.
7. Managing Plant environment-green house, green house covering material, environmental controls, mist chambers.
8. Media and soil mixtures for growing plants.

**Suggested Readings:**

1. S.K. Bhattacharjee and Lakshman Chandran De. 2010. Advanced Commercial Floriculture, Vols. I and II Aavishkar Pub., Second Revised and Enlarged Edition, 798.
2. D. Ravinath. 2007. Floriculture: A Viable Business. Excel Books
3. S.Prasad, U. Kumar. 2010. A Handbook of Floriculture). Agrobios (India)
4. John M. Dole and Harold F. Wilkins. 2004. Floriculture: Principles and Species : Prentice Hall; 2 edition (2<sup>nd</sup> Edition)
5. Paul V. Nelson (Author). 2002. Greenhouse Operation and Management. Prentice Hall; 6 edition (6<sup>th</sup> Edition)

**PGDF-102 Improvement of Ornamental Plants**

**IA: 20**

**Max. Marks: 80 (Theory),**

**Duration: 3 hours Credit-4**

**Learning Outcome:**

**CO1** Students will be able to understand the concepts of genetic variations and mechanisms for improvement and domestication of ornamental plants.

**CO2** Learners will be cognizant about the various methods for the vegetative propagation of commercial ornamental plants

**CO3** Students will strengthen skills in improving various ornamental plants of commercial importance.

**CO4** Students will be able to handle some of the practical skills of plant multiplication.

**Note: Nine question will be set in all. Question No. 1 will be compulsory and short answer type covering the entire syllabus. Remaining eight questions will be set unit-wise and four questions from each unit. The candidates will be required to attempt Question no. 1 and four more selecting two questions from each unit. All questions carry equal marks.**

**UNIT-1**

1. History and overview.
2. Role of Introduction and selection for domestication.
3. Variation and genetic mechanism associated with flower characters like double ness and color in important annuals, bulbs and shrubs.
4. Vegetative propagation: Principles and practices of clone selection.
5. Techniques of cutting, budding, grafting and layering
6. Propagation by specialized stems and roots.

**UNIT-2**

1. General account of improvement of Roses, Chrysanthemum, Dahlia, Gladiolus, Lilies, Marigold, Zinnia, Carnation, Bougainvillea, Hibiscus rosa sinensis.

**Suggested Readings:**

1. J.S. Arora.2007, introductory ornamental horticulture. Kalyani Publications.
2. Allan M. Armitage and Judy M. Laushman. 2008 Speciality Cut Flowers: The Production of Annuals, Perennials, Bulbs and Woody Plants for Fresh and Dried Cut Flowers. Timber Press; REV
3. Gwen Kelaidis and Saxon Holt. 2008. Hardy Succulents: Tough Plants for Every Climate. Storey Publishing, LLC.
4. Christopher Brickell. Royla Horticulture Society. Encyclopedia of Plants and Flowers (Rhs).
5. D.G. Hessayon. 2005. The House Plant Expert. Expert; 2<sup>nd</sup> edition.

**PGDF-103 Seed production and Micro propagation IA: 20**

**Max. Marks: 80 (Theory),  
Duration: 3 hours Credit-4**

**Learning Outcome:**

**CO1** Students will be able to understand about the various methods of seed production, handling, testing and their storage.

**CO2** Students will learn the different methods of tissue culture that can be used in propagation of ornamental plants.

**CO3** Students will acquire knowledge regarding non-conventional multiplication of ornamental plants.

**CO4** Students will be learning preparation of artificial seeds and their application.

**Note: Nine question will be set in all. Question No. 1 will be compulsory and short answer type covering the entire syllabus. Remaining eight questions will be set unit-wise and four questions from each unit. The candidates will be required to attempt Question no. 1 and four more selecting two questions from each unit. All questions carry equal marks.**

**UNIT-1**

1. Seed development, structure and stages of seed development.
2. Apomixis and Polyembryony: a general account.
3. Seed production systems
4. Techniques for seed production and handling

5. Seed testing and seed storage
6. Seedling production system
7. Field seedlings, field nurseries

## UNIT-II

1. Principles of tissue culture and micropropagations
2. Types of tissue culture systems.
3. Media preparation, sterilization, types of media, methods and applications
4. Protoplast and cell suspension cultures
5. Synthetic seeds
6. Micropropagation of orchids and Carnation.
7. Clonal selection of micropropagated plant

### Suggested Readings:

1. Introductory ornamental Horticulture 2007. J.S. Arora, Kalyani Publishers.
2. Advances in ornamental Horticulture, S.K. Bhattacharjee. 2006, Pointer Publishers.
3. Post Harvest Technology of flowers and ornamental plants. S.K. Bhattacharjee 2005, Pointer Publishers.
4. Advanced Commercial Floriculture, S.K. Bhattacharjee 2010. Aaviskar Publishers.
5. Ornamental Horticulture by Vishnu Swarup, Mac Milan Publishers.
6. Plant Propagation by M.K. Sadhu 1989. New Age International Publishers.
7. Propagation of tropical and sub-tropical horticulture crops. Bose, T.K., Mitra, S.K. and Sadhu, M.K. Noya Prakash Publisher.

**PGDF-104    Agro technology and Marketing**

**IA: 20**

**Max. Marks: 80 (Theory),**

**Duration: 3 hours    Credit-4**

### Learning Outcome:

**CO1** Students will fathom techniques of harvesting, post-harvest management, packaging and marketing of commercial ornamental plants.

**CO2** Students will be acquainted about different value added products, ways of value addition and challenges in value addition industry.

**CO3** Students will strengthen their knowledge regarding cut flower business.

**CO4** Learners will acquire knowledge regarding marketing and plant quarantine issues.

**Note: Nine question will be set in all. Question No. 1 will be compulsory and short answer type covering the entire syllabus. Remaining eight questions will be set unit-wise and four**

**questions from each unit. The candidates will be required to attempt Question no. 1 and four more selecting two questions from each unit. All questions carry equal marks.**

### **UNIT-1**

1. Scope and importance of commercial floriculture in India
2. Production techniques- both conventional and modern for ornamental plants like Roses, Chrysanthemum, Gladiolus, Tuberose and Gerbera for domesticated and export markets.
3. Hybrid seed production, Post harvest technology of cut flowers in respect of commercial flower crop production of dry flowers.

### **UNIT- II**

1. Indian floriculture industry: An overview
2. Strategies for marketing of floriculture products, IPR and quarantine laws
3. Cut flowers as specialty crops, cut flower industries
4. Trading flowers and potted plants
5. Value addition in floriculture: cosmetics and perfume industry and outdoor designing.
6. Cutting, grading, packaging and marketing of cut flower crops (Aster, Carnation, Chrysanthemum, Gladiolus, Narcissus, Orchids and Antirrhinum) for national and International market.

### **Suggested Readings:**

1. Introductory ornamental Horticulture 2007. J.S. Arora, Kalyani Publishers.
2. Advances in ornamental Horticulture, S.K. Bhattacharjee. 2006, Pointer Publishers.
3. Post Harvest Technology of flowers and ornamental plants. S.K. Bhattacharjee 2005, Pointer Publishers.
4. Advanced Commercial Floriculture, S.K. Bhattacharjee 2010. Aaviskar Publishers.
5. Ornamental Horticulture by Vishnu Swarup, Mac Milan Publishers.
6. Plant Propagation by M.K. Sadhu 1989. New Age International Publishers.
7. Propagation of tropical and sub-tropical horticulture crops. Bose, T.K., Mitra, S.K. and Sadhu, M.K. Noya Prakash Publisher.