# Horticulture (Code No. 816)

**JOB ROLE: FLORICULTURIST (PROTECTED/ENTREPRENEUR)**
**SESSION 2019-2020**
**CLASS XII**

## 1. Introduction

Horticulture is associated with the cultivation of vegetables, fruits, flowers, crops, tuber crops and medicinal, aromatic and ornamental plants where one can attain knowledge about crop production, plant propagation, plant breeding, genetic engineering, preparation of soil and plant physiology and biochemistry and simultaneously can work in various fields including floral design, garden centers, teaching, fruit and vegetable production, arboriculture, landscape construction, etc.

A Floriculturist (Protected Cultivation) is a person who has under taken the various activities of flower cultivation involving preparatory cultivation, cultivation and post harvest management in green house. He also perform maintenance and care of plant, design and maintenance of green house, preparing media and various other inputs essential for flower crop cultivation. The job is to be performed in efficient manner to allow the production of high quality of flowers, their harvesting and post harvest management towards getting higher return.

## 2. Course Objectives

On completion of the course, students should be able to:

1. Apply effective oral and written communication skills to interact with people and customers;
2. Identify the principal components of a computer system;
3. Demonstrate the basic skills of using computer;
4. Demonstrate self-management skills;
5. Demonstrate the ability to provide a self-analysis in context of entrepreneurial skills & abilities;
6. Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
7. Communicate effectively with the client, identify the principal components of a computer system, Identify different types of protected structure and Identify and categories crops for protected cultivation
8. Prepare media for protected cultivation
9. Demonstrate irrigation and fustigation ,green house operations ,irrigation and fustigation , care and maintenance of protected structure Demonstrate special horticultural practices in protected cultivation Identify and control of insect-pest and diseases demonstrate the harvest and post-harvest practices
10. Administer first aid to a casualty with small cuts, grazes, bruises, external bleeding, minor burns and scalds

# 3. Curriculum

11.

This course is a planned sequence of instructions consisting of Units meant for developing employability and Skills competencies of students of Class XII opting for Skills subject along with general education subjects.

| | |
|---|---|
| Theory | 60 marks |
| Practical | 40 marks |
| **Total Marks** | **100 marks** |

**The unit-wise distribution of periods and marks for Class XII is as follows**:

| CLASS XII (SESSION 2019-2020) | | | | |
|---|---|---|---|---|
| **Section** | **Units** | **No. of Periods for Theory and Practical 260** | | **Max. Marks for Theory and Practical 100** |
| **Part A** | **Employability Skills** | | | |
| | Unit 1: Communication Skills – IV | 10 | | 10 |
| | Unit 2: Self-management Skills –IV | 10 | | |
| | Unit 3: Information and Communication Technology Skills – IV | 10 | | |
| | Unit 4: Entrepreneurial Skills – IV | 15 | | |
| | Unit 5: Green Skills – IV | 05 | | |
| | **Total** | **50** | | **10** |
| **Part B** | **Skills** | **Theory** | **Practical** | |
| | Unit 1: Present scenario and scope of floriculture in global market | 08 | | 05 |
| | Unit 2: Employment avenues in floriculture sector | 08 | | 06 |
| | Unit 3: Study of outdoor room concept: public area, private area and service area | 08 | | 06 |
| | Unit 4: Different features of gardens like gate, walls, arches, pergolas, paths, roads, edges, hedges, stepping stones, sun dial, bird bath, statues, water fountain, lawns, herbaceous borders, bonsai, topiary etc. | 15 | | 08 |
| | Unit 5: Concept of CAD (Computer aided designs) for landscape designs. | 10 | | 04 |
| | Unit 6: Methods of establishing lawns and their management including irrigation, fertilization, mowing, insect-pest and diseases and their control. | 10 | | 03 |
| | Unit 7: Production of indoor plants and their maintenance. | 10 | | 02 |
| | Unit 8: Commercial cultivation of rose, chrysanthemum, gladiolus, marigold, tuberose, | 25 | | 02 |

| | | | | |
|---|---|---|---|---|
| | jasmine and crossandra. | | | |
| | Unit 9: Protected cultivation of commercial flower crops like rose, carnation, chrysanthemum, gerbera, orchids, antirrhinum etc). | 25 | | 02 |
| | Unit 10: Flower arrangements: types and styles. | 10 | | 05 |
| | Unit 11: Methods of dry flower making like air drying, embedded drying, water drying, press drying, glycerin drying, freeze drying etc. and other value added products. | 11 | | 04 |
| | Unit 12: Post-harvest handling of commercial flower crops including harvesting, pre cooling, pulsing, holding, dry and wet storage, packing, packaging and transportation. | 20 | | 03 |
| | **Total** | **160** | **50** | **50** |
| **Part C** | **Practical Work** | | | |
| | Practical Examination | | | 15 |
| | Written Test | | | 10 |
| | Viva Voce | | | 05 |
| | **Total** | | | 30 |
| **Part D** | **Project Work/Field Visit** | | | |
| | Practical File/Student Portfolio | | | 10 |
| | **Total** | | | **10** |
| | **Grand Total** | | | **100** |

# 4. CONTENTS

## CLASS XII (SESSION 2019-2020)

### PART A: EMPLOYABILITY SKILLS

| | **Units** |
|---|---|
| 1. | Communication Skills –IV |
| 2. | Self-management Skills –IV |
| 3. | Information and Communication Technology Skills – IV |
| 4. | Entrepreneurial Skills – IV |
| 5. | Green Skills – IV |
| | **Detailed curriculum of Employability Skills is available separately** |

## PART B: SKILLS

**Unit 1:**
Present scenario and scope of floriculture in global market
**Unit 2:**
Employment avenues in floriculture sector
**Unit 3:**
Study of outdoor room concept: public area, private area and service area
**Unit 4:**
Different features of gardens like gate, walls, arches, pergolas, paths, roads, edges, hedges, stepping stones, sun dial, bird bath, statues, water fountain, lawns, herbaceous borders, bonsai, topiary etc.
**Unit 5:**
Concept of CAD (Computer aided designs) for landscape designs.
**Unit 6:**
Methods of establishing lawns and their management including irrigation, fertilization, mowing, insect-pest and diseases and their control.
**Unit 7:**
Production of indoor plants and their maintenance.
**Unit 8:**
Commercial cultivation of rose, chrysanthemum, gladiolus, marigold, tuberose, jasmine and crossandra.
**Unit 9:**
Protected cultivation of commercial flower crops like rose, carnation, chrysanthemum, gerbera, orchids, antirrhinum etc).
**Unit 10:**
Flower arrangements: types and styles.
**Unit 11:**
Methods of dry flower making like air drying, embedded drying, water drying, press drying, glycerin drying, freeze drying etc. and other value added products.
**Unit 12**:
Post-harvest handling of commercial flower crops including harvesting, pre cooling, pulsing, holding, dry and wet storage, packing, packaging and transportation.

# 5. TEACHING ACTIVITIES

The teaching and training activities have to be conducted in classroom, laboratory/ workshops and field visits. Students should be taken to field visits for interaction with experts and to expose them to the various tools, equipment, materials, procedures and operations in the workplace. Special emphasis should be laid on the occupational safety, health and hygiene during the training and field visits.

**CLASSROOM ACTIVITIES**

Classroom activities are an integral part of this course and interactive lecture sessions, followed by discussions should be conducted by trained teachers. Teachers should make effective use of a variety of instructional or teaching aids, such as audio-video materials, colour slides, charts, diagrams, models, exhibits, hand-outs, online teaching materials, etc. to transmit knowledge and impart training to the students.

**PRACTICAL WORK IN LABORATORY/WORKSHOP**

Practical work may include but not limited to hands-on-training, simulated training, role play, case based studies, exercises, etc. Equipment and supplies should be provided to enhance hands-on learning experience of students. Only trained personnel should teach specialized techniques. A training plan that reflects tools, equipment, materials, skills and activities to be performed by the students should be submitted by the teacher to the Head of the Institution

**SKILL ASSESSMENT (PRACTICAL)**

Assessment of skills by the students should be done by the assessors/examiners on the basis of practical demonstration of skills by the candidate, Practical examination allows candidates to demonstrate that they have the knowledge and understanding of performing a task. This will include hands-on practical exam and viva voce. For practical, there should be a team of two evaluators. The same team of examiners will conduct the viva voce.

**Project Work** (individual or group project) is a great way to assess the practical skills on a certain time period or timeline. Project work should be given on the basis of the capability of the individual to perform the tasks or activities involved in the project. Projects should be discussed in the class and the teacher should periodically monitor the progress of the project and provide feedback for improvement and innovation. Field visits should be organised as part of the project work. Field visits can be followed by a small-group work/project work. When the class returns from the field visit, each group might be asked to use the information that they have gathered to prepare presentations or reports of their observations. Project work should be assessed on the basis of practical file or student portfolio.

**Student Portfolio** is a compilation of documents that supports the candidate's claim of competence. Documents may include reports, articles, photos of products prepared by students in relation to the unit of competency.

**Viva voce** allows candidates to demonstrate communication skills and content knowledge. Audio or video recording can be done at the time of viva voce. The number of external examiners would be decided as per the existing norms of the Board and these norms should be suitably adopted/adapted

as per the specific requirements of the subject. Viva voce should also be conducted to obtain feedback on the student's experiences and learning during the project work/field visits.

# 6. ORGANISATION OF FIELD VISITS/EDUCATIONAL TOURS

In a year, at least 3 field visits/educational tours should be organised for the students to expose them to the activities in the workplace.

Visit a Polyhouse/Green house and observe the following: Location, Site , area, types of greenhouse, infrastructure, equipments used, Office building, Store, Pot yard, Packing Yard, Seed bed, Nursery bed, Water tank/Tube well, Gate and fencing. During the visit, students should obtain the following information from the owner or the supervisor of the nursery:

1. Area under polyhouse and its layout
2. Types of plants/flowers raised
3. Type of rootstock used
4. Methods of propagation adopted
5. Whether plants/flowers raised by micropropagation
6. Number of plants /flowersgrow annually
7. Number of plants/flowers sold annually
8. Sale procedure
9. Manpower engaged
10. Total expenditure in construction of greenhouse/nursery
11. Irrigation unit
12. Fustigation unit
13. Total annual income
14. Profit/Loss (Annual)
15. Any other information

# 7. LIST OF EQUIPMENT AND MATERIAL

**T**he list given below is suggestive and an exhaustive list should be prepared by the vocational teacher. Only basic tools, equipment and accessories should be procured by the Institution so that the routine tasks can be performed by the students regularly for practice and acquiring adequate practical experience.

| | | | |
|---|---|---|---|
| 1. | Tape | 35. | Pruning knife |
| 2. | Crow bar | 36. | Super cut |
| 3. | Rope | 37. | Thinning scissor |
| 4. | Khurpi | 38. | Hand cultivator |
| 5. | Wheel hoe | 39. | Hand weedier |
| 6. | Trenching hoe | 40. | Weeding fork |
| 7. | Transplanting travel | 41. | Garden hoe |

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|---|---|---|---|
| 8. | Dibbler | 42. | Shovel |
| 9. | Planting board | 43. | Digging fork |
| 10. | Secateurs | 44. | Garden rake |
| 11. | Garden hatchet | 45. | Spade |
| 12. | Water can | 46. | Small Trowel |
| 13. | Sprinkler | 47. | Rake |
| 14. | Sprayer | 48 | Drip and sprinkler |
| 15. | Duster | 49. | Mobile benches |
| 16. | Temperature & humidity control | 50. | Fan |
| 17. | System | 51. | Pad |
| 18. | Automatic shade system | 52. | Ventilator |
| 19. | Fogging and blackout | 53. | Thermometer |
| 20. | Irrigation system | 54. | Lux meter/Light meter |
| 21. | Mobile benches, | 55. | Misting |
| 22. | Fan | 56. | Digitale elctronic temperature indicator |
| 23. | Pad | | |
| 24. | Ventilator | 57. | Radiation measuring instrument |
| 25. | Thermometer | 58. | Sprayer |
| 26. | Lux meter/Light meter | 59. | Hygrometer |
| 27. | Digital electronic temperature Indicator | **List of Chemicals** | |
| | | 60. | Dry and liquid fertilizer |
| 28 | Radiation measuring instrument | 61. | Peat |
| 29. | Sprayer | 62. | Formalin |
| 30. | Hygrometer. | 63. | Bavestin |
| 31. | Temperature & humidity control | 64. | Sulphur |

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|---|---|---|---|
| | System | 65. | Insecticide |
| 32. | Automatic shade system | 66. | Indofil-45 |
| 33. | Fogging and blackout | 67 | Neem cake |
| 34. | Irrigation system | 68. | Plant Growth regulator/hormones |

# 8. PRACTICAL GUIDELINES

**(As the practical is primarily an outdoor activity the schools can carry them out in the allocated 50 Periods.)**

1. Visit to flower market during different seasons.
2. Performing intercultural operations like training, pruning in roses.
3. Performing staking, pinching, de-shooting and disbudding in carnation and chrysanthemum flower crops.
4. Maintenance of mother plants of chrysanthemum.
5. Embedded drying of important flower crops using different embedding media.
6. Studying morphological characteristics of available varieties of flower crops available in your locality.
7. Identification of important pests and diseases of lawn and avenue plants.
8. Preparation of pesticide solutions and their spraying for control of insect, pests and diseases.
9. Preparation of dry flower products like greeting cards, book marks, wall hangings and dry flower baskets.
10. Preparation of landscape designs for school and college using CAD technology.
11. Preparation of landscape designs for home gardens.
12. Preparation of landscape designs for public parks.
13. Preparation of different flower arrangements like ikebana, garland, bouquets etc.
14. Calculating the cost of production of important flower crops.
15. Packing and packaging of commercial flower crops.