GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

COMPETENCY BASED CURRICULUM

FLORICULTURE & LANDSCAPING

(Duration: One Year)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 3.5


SECTOR – AGRICULTURE

Directorate General of Training

FLORICULTURE & LANDSCAPING

(Non-Engineering Trade)

(Revised in March 2023)

Version: 2.0

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL – 3.5

Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

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1. COURSE INFORMATION

During the one-year duration of "Floriculture & Landscaping" trade, a candidate is trained on Professional Skill, Professional Knowledge and Employability Skill related to job role. In addition to this, a candidate is entrusted to undertake project work, extracurricular activities and on-the-job training to build up confidence. The broad components covered under Professional Skill subject are as below:-

The trainee learns about agro-meteorology, importance of different elements of weather and climate of agriculture. Soil properties, soil management, formation of soil moisture and its conservation. Role of organic matter in soil and its recycling water and their management. Soil fertility, fertilizers, manures and management of soil fertility & productivity. Fundamentals of floriculture, nursery and seed production. Practicing simple and tongue layering, ground layering, air layering or goo tee. Planting materials and their cultivation practices etc.

The trainee learns about identification and study important commercial varieties of the flowering crops. Preparation of ground and beds for planting specific flower crops. Layout of plots and gardens, planning for home gardens, landscape gardens. Preparation and execution of landscape plants maintenance of gardens and lawns. Accessories and containers for flower arrangements. Floral arrangement preparation of floral ornaments bouquets etc. Preparation of bottle gardens, terrarium etc. Protected cultivation of flowers. Identifications and study of poly house, shed net house, mulching. Familiarization with species of honey bees and different types of colony, organization and bee boxes.

2. TRAINING SYSTEM

2.1 GENERAL

The Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers a range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under the aegis of Directorate General of Training (DGT). Craftsman Training Scheme (CTS) with variants and Apprenticeship Training Scheme (ATS) are two pioneer schemes of DGT for strengthening vocational training.

'Floriculture & Landscaping' trade under CTS is one of the popular courses delivered nationwide through a network of ITIs. The course is of one-year duration. It mainly consists of Domain area and Core area. The Domain area (Trade Theory & Practical) imparts professional skills and knowledge, while Core area (Employability Skill) imparts requisite core skills, knowledge, and life skills. After passing out the training program, the trainee is awarded National Trade Certificate (NTC) by DGT which is recognized worldwide.

Candidates broadly need to demonstrate that they are able to:

- Read and interpret technical parameters/documents, plan and organize work processes, identify necessary materials and tools;
- Perform tasks with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge & employability skills while performing jobs.
- Document the technical parameters related to the task undertaken.

2.2 PROGRESSION PATHWAYS

- Can join industry as Floriculturist and will progress further as Senior Floriculturist, Supervisor and can rise to the level of Manager.
- Can become Entrepreneur in the related field.
- Can join Apprenticeship programs in different types of industries leading to a National Apprenticeship certificate (NAC).
- Can join as floral designer, Floral sales representative, General Manager (Plantation), General Manager, (Agricultural Farm)
- Can join Advanced Diploma (Vocational) courses under DGT as applicable.

2.3 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of one year: -

S No.	Course Element	Notional Training Hours
1	Professional Skill (Trade Practical)	840
2	Professional Knowledge (Trade Theory)	240
3	Employability Skills	120
	Total	**1200**

Every year 150 hours of mandatory OJT (On the Job Training) at nearby industry, wherever not available then group project is mandatory.

On the Job Training (OJT)/ Group Project	150
Optional Courses (10th/ 12th class certificate along with ITI certification or add on short term courses)	240

Trainees of one-year or two-year trade can also opt for optional courses of up to 240 hours in each year for 10th/ 12th class certificate along with ITI certification or add on short term courses.

2.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of course through formative assessment and at the end of the training programme through summative assessment as notified by the DGT from time to time.

a) The **Continuous Assessment** (Internal)during the period of training will be done by **Formative Assessment Method** by testing for assessment criteria listed against learning outcomes. The training institute has to maintain an individual trainee portfolio as detailed in assessment guideline. The marks of internal assessment will be as per the formative assessment template provided on www.bharatskills.gov.in.

b) The final assessment will be in the form of summative assessment. The All India Trade Test for awarding NTC will be conducted by Controller of examinations, DGT as per the guidelines. The pattern and marking structure is being notified by DGT from time to time. **The learning**

outcome and assessment criteria will be the basis for setting question papers for final assessment. The examiner during final examination will also check the individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

For the purposes of determining the overall result, weightage of 100% is applied for six months and one-year duration courses and 50% weightage is applied to each examination for two years courses. The minimum pass percent for Trade Practical and Formative assessment is 60% & for all other subjects is 33%.

2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking the assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/waste as per procedure, behavioral attitude, sensitivity to the environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising some of the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work
- Computer based multiple choice question examination
- Practical Examination

Evidences and records of internal (Formative) assessments are to be preserved until forthcoming examination for audit and verification by examining body. The following marking pattern to be adopted for formative assessment:

Performance Level	Evidence

(a) Marks in the range of 60%-75% to be allotted during assessment	
For performance in this grade, the candidate should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices	• Demonstration of good skills and accuracy in the field of work/ assignments. • A fairly good level of neatness and consistency to accomplish job activities. • Occasional support in completing the task/ job.
(b) Marks in the range of 75%-90% to be allotted during assessment	
For this grade, a candidate should produce work which demonstrates attainment of a reasonable standard of craftsmanship, with little guidance, and regard for safety procedures and practices	• Good skill levels and accuracy in the field of work/ assignments. • A good level of neatness and consistency to accomplish job activities. • Little support in completing the task/job.
(c) Marks in the range of more than 90% to be allotted during assessment	
For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	• High skill levels and accuracy in the field of work/ assignments. • A high level of neatness and consistency to accomplish job activities. • Minimal or no support in completing the task/ job.

3. JOB ROLE

Floral Designer; designs, cuts, and arranges live, dried, or artificial flowers and foliage. confers with clients regarding price and type of arrangement desired and the date, time, and place of delivery. Plans arrangement according to client's requirements, utilizing knowledge of design and properties of materials, or select appropriate standard design pattern. Waters plants, and cut, condition, and clean flowers and foliage for storage. Selects flora and foliage for arrangements, working with numerous combinations to synthesize and develop new creations. Order and purchase flowers and supplies from wholesalers and growers. Wraps and price completed arrangements. Trims material and arranges bouquets, wreaths, terrariums, and other items using trimmers, shapers, wire, pins, floral tape, foam, and other materials. Performs office and retail service duties such as keeping financial records, serving customers, answering telephones, selling giftware items and receiving payment. Informs customers about the care, maintenance, and handling of various flowers and foliage, indoor plants, and other items. Decorates or supervises the decoration of buildings, halls, churches, or other facilities for parties, weddings and other occasions.

Floriculturist- (Open Cultivation); performs the duties of a flower crop cultivator in the open field

Floriculturist- (Protected Cultivation); performs the duties of a flower crop cultivator in the green houses.

Seed Grower/Quality Seed Grower; propagates and grows horticultural-specialty products and crops, such as seeds, bulbs, rootstocks, sod, ornamental plants, and cut flowers: Plans acreage utilization and work schedules, according to knowledge of crop culture, climate and market conditions, seed, bulb, or rootstock availability, and employable work force and machinery. Attaches farm implements, such as disk and fertilizer spreader, to tractor and drives tractor in fields to till soil and plant and cultivate crop. Inspects fields periodically to ascertain nutrient deficiencies, detect insect, disease, and pest infestations, and identify foreign-plant growth, and selects, purchases, and schedules materials, such as fertilizers and herbicides, to ensure quality control. Hires field workers; assigns their duties according to scheduled activities, such as planting, irrigating, weeding, and harvesting; and oversees their activities. Maintains personnel and production records. Arranges with customers for sale of crop. May oversee activities, such as product cleaning, grading, and packaging. May provide customer services, such as planning and building planters, walls, and patios, and planting and caring for landscape and display arrangements. May bud or graft scion stock on plantings to alter growth characteristics. May develop new variations of species specialty to produce crops with specialized market appeal. May cultivate out-of-season seedlings and crops, using greenhouse. May cultivate cover crop, such as hay or rye, in rotation with horticultural specialty to rejuvenate soil. May drive and

operate self-propelled harvesting machine. May lubricate, adjust, and make minor repairs on farm machinery and equipment.

Reference NCO-2015:

a) 3435.0500 –Floral Designer
b) 6113.0601 – Floriculturist- (Open Cultivation)
c) 6113.0602 – Floriculturist- (Protected Cultivation)
d) 6130.0201 – Seed Grower/Quality Seed Grower

Reference NOS:

a) AGR/N9401
b) AGR/N9402
c) AGR/N0701
d) AGR/N0718
e) AGR/N0720
f) AGR/N0721
g) AGR/N0722
h) AGR/N0723
i) AGR/N0714
j) AGR/N0715
k) AGR/N0702
l) AGR/N0707
m) AGR/N0708
n) AGR/N0803
o) AGR/N0842
p) AGR/N0801
q) AGR/N0802
r) AGR/N8101
s) AGR/N8108
t) AGR/N1013

4. GENERAL INFORMATION

Name of the Trade	**FLORICULTURE & LANDSCAPING**
NCO - 2015	3435.0500 , 6113.0601, 6113.0602, 6130.0201
NOS Covered	AGR/N9401, AGR/N9402, AGR/N0701, AGR/N0718, AGR/N0720, AGR/N0721, AGR/N0722, AGR/N0723, AGR/N0714, AGR/N0715, AGR/N0702, AGR/N0707, AGR/N0708, AGR/N0803, AGR/N0842, AGR/N0801, AGR/N0802, AGR/N8101, AGR/N8108, AGR/N1013
NSQF Level	Level-3.5
Duration of Craftsmen Training	One Year (1200 Hours + 150 Hours OJT/Group Project)
Entry Qualification	Passed 10th class examination or its equivalent .
Minimum Age	14 years as on first day of academic session.
Eligibility for PwD	LD, CP, LC, DW, AA, LV, DEAF, HH, AUTISM, ID, SLD
Unit Strength (No. of Student)	24 (There is no separate provision of supernumerary seats)
Space Norms	10000 Sq. m (1 Hectare plot of land)
Power Norms	2 KW
Instructors Qualification for:	
(i) Floriculture & Landscaping Trade	B.Voc/Degree in Agriculture from UGC recognized university with one-year post qualification experience in the relevant field. **OR** Diploma (Minimum 2 years) in Agriculture/ Horticulture from a recognized board of educationor relevant Advanced Diploma (Vocational) from DGT with two-year experience in the relevant field. **OR** NTC/ NAC passed in the trade of "Floriculture & Landscaping" with three-year experience in the relevant field. **<u>Essential Qualification</u>:** Relevant Regular / RPL variants of National Craft Instructor Certificate (NCIC) under DGT. ***<u>Note:-</u>Out of two Instructors required for the unit of 2 (1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications. However, both of them must possess NCIC in any of***

	its variants.
(ii) Employability Skill	MBA/ BBA / Any Graduate/ Diploma in any discipline with Two years' experience with short term ToT Course in Employability Skills. (Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above) **OR** Existing Social Studies Instructors in ITIs with short term ToT Course in Employability Skills.
(iii) Minimum Age for Instructor	21 Years
List of Tools and Equipment	As per Annexure – I

5. LEARNING OUTCOME

Learning outcomes are a reflection of total competencies of a trainee and assessment will be carried out as per the assessment criteria.

5.1 LEARNING OUTCOMES

1. Identify metrological instruments and understand the diversity within the profession of Floriculture following safety precautions. (NOS: AGR/N9401)
2. Identify Plant morphology, different plant varieties and plant families. (NOS: AGR/N9402)
3. Identify different Soil types, Methods of soil sampling and collection, detection on physical and chemical properties of soil, Interpret soil test reports for proper rectification. (NOS: AGR/N8101, AGR/N8108)
4. Measure Soil fertility and apply soil fertility management for improvement of fertility of soil. (NOS: AGR/N0701)
5. Apply integrated nutrient Management system (INMS) in the field. (NOS: AGR/N0701)
6. Identify and select different propagation methods, handling of seed, bulbs, cut flowers, Nursery plants, pot plants. (NOS: AGR/N0718)
7. Identify and apply method of vegetative propagation and its management. (NOS: AGR/N0718)
8. Identify Commercial Flowers and their packaging.
   (NOS: AGR/N0701, AGR/N0715, AGR/N0720, AGR/N0721, AGR/N0722, AGR/N0723, AGR/N0714, AGR/N0803, AGR/N0842, AGR/N0801)
9. Identify the diseases and apply the pesticide as per requirement. (NOS: AGR/N0702)
10. Plan and execute Survey for landscaping and various types of indoor gardening. (NOS: AGR/N0802, AGR/N0803, AGR/N0707, AGR/N0708)
11. Carry out Protected cultivation of flower. (NOS: AGR/N1013)

6. ASSESSMENT CRITERIA

LEARNING OUTCOMES	ASSESSMENT CRITERIA
1. Identify metrological instruments and understand the diversity within the profession of Floriculture following safety precautions. (NOS: AGR/N9401)	Importance of different elements of weather and climate in agriculture.
	Knowledge on different agro-climatic regions of the country.
	Knowledge on crops grown relating to seasonal pattern, its field preparation methods, sowing and harvest.
	Identify different meteorological instruments and its use.
	Observe the different meteorological data and draw sketches.
	Knowledge on fundamentals of horticulture.
	Identification of plants based on botanical classification.
	List-out common names and botanical names
	Describe the commercial importance of horticulture plants.
2. Identify Plant morphology, different plant varieties and plant families. (NOS: AGR/N9402)	Knowledge on plant morphology.
	Identify different plant varieties.
	Identify different plant families.
3. Identify different Soil types, Methods of soil sampling and collection, detection on physical and chemical properties of soil, Interpret soil test reports for proper rectification. (NOS: AGR/N8101, AGR/N8108)	Identify different soil types
	Demonstrate soil sampling method, collection of soil, and procedure for sending to soil testing laboratory
	Knowledge on physical and chemical properties of soil
	Interpret soil test report
	Execute measurement of soil pH by litmus method and electronic pH meter.
	Analyze soil water holding capacity
	Demonstrate the use of soil testing kit.
	Knowledge on soil correction methods for acid soil, saline soil and alkaline soil.
	Demonstrate recycling methods of organic matter in soil
	Illustrate role of organic matter in soil.
	Demonstrate collection methods of Azolla and BGA.
	Describe the use of Azolla and BGA
4. Measure Soil fertility and	Knowledge on soil fertility and soil fertility management.

apply soil fertility management for improvement of fertility of soil. (NOS: AGR/N0701)	Knowledge on fertilizer and organic manures.
	List out different methods of composting
	Differentiate between FYM, sludge, poultry manure, vermin compost and NADEP compost.
	Execute the process of vermin compost and NADEP compost
	Evaluate the nutrient content of FYM, sludge, poultry manure, vermin compost and NADEP compost.
	Describe the role of different organic matter on improving soil quality.
5. Apply integrated nutrient Management system (INMS) in the field. (NOS: AGR/N0701)	Knowledge on Integrated nutrient management system (INMS)
	Knowledge on green manure crops, its cultivation and package of practice.
	Identify seeds of different green manure crops.
	Identify different green manure crops.
	List out different green manure crops.
	Demonstrate and describe the methods of incorporation of green manure crops for improving soil fertility.
6. Identify and select different propagation methods, handling of seed, bulbs, cut flowers, Nursery plants, pot plants. (NOS: AGR/N0718)	Demonstrate different propagation methods.
	Demonstrate handling of seeds, bulbs, cut flowers, nursery plants and pot plants.
	Knowledge on environmental factors, photo-periodism, dormancy and growth regulators.
	Illustrate protected cultivation.
	Identify and describe different garden tools.
	Identify different diseases, insect and weeds.
	Knowledge on irrigation and its management.
	Concept on different type and methods of irrigation.
	Install different irrigation systems.
	Knowledge on water management.
	Knowledge on nursery management and seed production methods.
7. Identify and apply method of vegetative propagation and its management.	Demonstrate different methods of vegetative propagation.
	Knowledge on management of vegetative propagation.
	Demonstrate different methods of bulb and corm production.

(NOS: AGR/N0718)	Knowledge on harvest and storage of bulb/ corm of different flowering plants.
	Identify different ornamental plants, flowering plants, indoor and bonsai plants.
	Knowledge on grading and packaging of seeds, seedlings, rooted cuttings pot plants, lawn grass, trees, shrubs, cacti, bonsai etc.
	Demonstrate pruning and shaping of plants.
	Knowledge selection of suitable plant species for landscaping, pot plants, lawn grass and bonsai
	Illustrate package of practice of pot plants, lawn grasses, landscape plants and bonsai.
8. Identify Commercial Flowers and their packaging. (NOS: AGR/N0701, AGR/N0719, AGR/N0720, AGR/N0721, AGR/N0722, AGR/N0723, AGR/N0714, AGR/N0715, AGR/N0803, AGR/N0842, AGR/N0801)	Identify commercial flowers.
	List out different commercial flowers.
	Illustrate package of practice of different commercial flowers.
	Knowledge on quality assessment, pulsing, conditioning, storage, packing of commercial flowers like lose flowers, long stem cut flowers, perennials, cut greens and annuals.
9. Identify the diseases and apply the pesticide as per requirement. (NOS: AGR/N0702)	Identify pests and diseases.
	Prepare solution and application of sprays or dusts.
	Check quality parameters for cut flowers for domestic markets and for export.
10. Plan and execute Survey for landscaping and various types of indoor gardening. (NOS: AGR/N0802, AGR/N0803, AGR/N0707, AGR/N0708)	Knowledge on survey and drafting methods for landscaping.
	Knowledge on making layouts and design for landscaping.
	Design and execute landscape garden.
	Knowledge on history, styles, scope and importance of gardening.
	Select plants for landscaping and gardening.
	Knowledge on maintenance of gardens and lawns.
	List out and describe different garden types.
	Demonstrate different styles of bottle garden and terrarium.
	Select different pot plants.
	Demonstrate the arrangement of different pot plants.

	Knowledge on maintenance of different pot plants.
	Demonstrate different floral arrangements.
	Demonstrate oriental, western and Japanese (Ikebana) floral arrangements.
	List out accessories and containers for floral arrangements.
	Prepare floral ornaments and bouquets.
	Knowledge on conditioning of cut flowers.
	Demonstrate arrangement of cut flower and cut green.
	Knowledge on prolonging self-life of vase flowers.
11. Carry out Protected cultivation of flower. (NOS: AGR/N1013)	Knowledge on protected cultivation of flowers.
	Identify poly house, shed net house and mulching.
	Construct ploy house, shed net house.
	Knowledge on mulching.

7. TRADE SYLLABUS

SYLLABUS FOR FLORICULTURE & LANDSCAPING TRADE			
DURATION: ONE YEAR			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
Professional Skill 90 Hrs. Professional Knowledge 24 Hrs.	Identify metrological instruments and understand the diversity within the profession of Floriculture following safety precautions.	1. Identification of meteorological instruments. 2. Demonstration for recording of a) Rainfall, b) Temperature, c) Humidity, d) Wind direction and speed, e) Evaporation and f) Sunshine hours. 3. Installation of the above instruments. 4. Recording meteorological data. 5. Visit to agro-meteorological Stations. 6. Follow General Safety, Occupational health and hygiene.	a) Importance of different elements of weather and climate in agriculture- rainfall, temperature, humidity, sunshine, wind speed and direction. b) Agro-climatic regions with their special character, Weather and climate of West Bengal - Annual and Seasonal pattern relating crop season, highlighting seasonal variation, Winter - Rabi, Summer - Pre -kharif, Monsoon - maturity and harvesting of Kharifcrops and field preparation and sowing of Rabi crops. c) Brief idea about Special weather phenomena and hazard weather events viz, cyclonic storm and storm surge, flood, drought, heat and cold wave, hailstorm, western disturbances and associated weather events: Their nature, period and areas of occurrence and effect on crops and crop management. Weather

			forecast & its implication.
Professional Skill 20Hrs. Professional Knowledge 06Hrs.	Identify Plant morphology, different plant varieties and plant families.	7. Germination, parts of roots, stems flowers and seeds. Identification of families/varieties.	Morphology, Physiology and other preliminary knowledge.
Professional Skill 65 Hrs. Professional Knowledge 18 Hrs.	Identify different Soil types, Methods of soil sampling and collection, detection on physical and chemical properties of soil, Interpret soil test reports for proper rectification.	Soils and Soil Management - 8. Visual identification of textural type of soils. 9. Collection of soil samples, procedure for sending samples to Soil Testing Laboratory. 10. Interpretation of soil testing results and fertilizer recommendation. 11. Practicing different methods of correction of soil acidity, such as liming, sludge, wood ash, dolomite, basic slag, rock phosphate with frequency and rate of application. 12. Study of soil particles - salt, silt, clay. Study soil porosity. 13. Study bulk and particle density of soil. 14. Study soil types based on textural classes. 15. Study different structures of soil. 16. Study soil reaction- Measurement of pH by litmus method and using electronics devices. 17. Study water holding	Texture (definition, particle size of soil ingredients i.e. sand, silt, clay) classification and importance. Porosity, bulk density & particle density. Structure (definition, classification, importance), water holding capacity, pH, EC, CEC, Soil solution, Soil classes on the basis of agro climatic zones. Acid, Alkaline and Saline soils: (i) Definition, (ii) Causes, (iii) Problems and (iv) Methods of correction. **Acid Soils** - different methods of correction of soil acidity, such as liming, sludge, wood ash, dolomite, basic slag, rock phosphate - their composition, frequency and rate of application. **Saline soils** - Corrections through improvement of drainage, flushing, leaching, scrapping. Methods to combat the salinity problems. Adoption of different agronomic

		capacity of soil. 18. Visit to acid soil and saline soil areas and identification of field problems. 19. Visit to a soil testing laboratory and use of soil testing kit. 20. Practice method of correction of acid soil by application of various materials such as lime, sludge, wood ash, dolomite, basic slag, rock phosphate. 21. Practicing methods of corrections through improvement of drainage, flushing, leaching and scrapping. 22. Practicing methods to combat the salinity problems. 23. Adoption of different agronomic practices such as ridge and furrow methods of sowing and irrigation. 24. Practice correction methods through application of Sulphur and Gypsum - frequency and rate of application. **Role of organic matter in soil and its recycling –** 25. Collection and use of Azolla, BGA and its multiplication. 26. Study of recycling of	practices such as ridge and furrow methods of sowing and irrigation, growing of salt tolerant crops. **Alkaline soils** - Correction through application of Sulphur and Gypsum - frequency and rate of application. a) Concept of soil organic matter - humus. b) Role of organic matter (OM): Effect of OM on soil properties such as structure. Effect of OM on soil micro-organisms. Effect of OM on soil fertility. c) Recycling of OM in the field. d) C/N Ratio of Soil and organic matter.

		organic matter.	
Professional Skill 105 Hrs. Professional Knowledge 30 Hrs	Measure Soil fertility and apply soil fertility management for improvement of fertility of soil. Apply integrated nutrient Management system (INMS) in the field.	Soil fertility, Manures and Fertilizers, Fertility Management - 27. Practice of Integrated Nutrient Management System (INMS) in the field. 28. Identification of seeds of Green Manuring crops. 29. Identification of different Green Manuring crops - Dhaincha, Kalai, Cowpea, Subabul, Glyricidia. 30. Demonstration and incorporation of green manuring crops. 31. Identification of bio-fertilizers. 32. Preparation of bio-fertilizers. 33. Practice of bio-fertilizers, application, techniques. 34. Field diagnostic study for deficiency symptoms of nutrient elements. 35. Identification of fertilizers and micronutrient containing chemicals. 36. Practice application of fertilizers and manures by various means. 37. Study of leaching, run-off, chemical and biological fixation of nitrogen. 38. Study of nodulation. 39. Practice cultural methods such as recycling or application of crop	a) Soil fertility, productivity and its maintenance. Concept and practices of INMS. b) Different types of manures such as compost (NADEP compost, Vermi compost), FYM, Sludge, Poultry manure: Their nutrient contents and role in improving soil and soil fertility. c) **Green manure** - Role of Green Manuring in crop production Green manuring, its principles, methods and practices. Different types of Green Manure crops. Cultivation of important GM crops such as Dhaincha, Kalai, Cowpea, Sunhemp, Glyricidia. d) **Bio-fertilizer** - (i) Concept and classification. (ii) Use of bio-fertilizer as Azolla, Blue-green algae, Rhizobium, Azotobactor, Phosphate and Potash solubilizing bacteria and mycorrhiza- their propagation, source of availability, application and limitations. e) Essential plant nutrient elements - Role of Major and Minor plant nutrient elements. Deficiency

		residue, ploughing, levelling, application of O.M., fertilizers and soil amendments, crop rotation and adoption of appropriate cropping systems for maintenance of soil fertility. **Fundamentals of Floriculture** 40. Common garden operations using different implements. 41. Identification & practice Bio fertilizer.	symptoms. **f) Chemical Fertilizers :** (i) Classification (both macro and micro-nutrient containing fertilizers), nutrient contents. (ii) Method of fertilizer application: Broadcasting, Band and furrow placement, Ring placement, Foliar spray - their advantages and disadvantages. (iii) Time of fertilizer application. **g) Depletion of Soil fertility :** (i) Factors affecting such as leaching, run-off, chemical and biological fixation of nitrogen, denitrification, volatilization, crop removal. (ii) Maintenance of soil fertility: through adoption of cultural methods such as recycling or application of crop residue, ploughing, levelling, application of O.M., fertilizers and soil amendments, crop rotation and adoption of appropriate cropping systems. Introduction and scope; branches of industry Present situation & scope, (Cut flowers, pot plants, seeds and bulbs,

			essential oil Landscaping, interior scaping).
Professional Skill 105 Hrs. Professional Knowledge 30 Hrs	Identify and select different propagation methods, Handling of seed, bulbs, cut flowers, Nursery plants, pot plants.	42. Handling of soils, purpose of nursery bed, potting media, potting etc. 43. Propagation by cutting, budding, grafting. 44. Audio Visual demonstration. 45. Handling of seeds, bulbs, cut flowers, nursery plants, pot plants. 46. Audio Visual demonstration. 47. Acquaintance with soil types, various manures, fertilizers, Vermi compost, pesticides, growth regulator. **Nursery and Seed Production:-** 48. Studying and identification of seeds & testing viability. 49. Seed treatment, soil treatment before sowing. 50. Studying seed sowing in beds and containers. 51. Studying different media, soil mixture for raising plants by seeds, cutting. 52. Methods of different types of seed sowing. 53. Transplanting or potting the seedling in the pots, polythene bags and in other containers. 54. Studying of floricultural tools used in maintenance and in propagation.	Soils and other media, manures and fertilizers, Irrigation. Bio fertilizer. Environmental factors, ecological physiology, photo periodism, dormancy, growth regulators. • Cultivation under protection. • Garden implements and important operations, control of diseases, insects and weeds. • Methods of propagation. • Time of Propagation. Methods of seeds & bulbs collection and storing. Post-harvest technology of cut flowers, seeds, bulbs. Irrigation & Water management. Including micro irrigation techniques like drip, sprinkler, fogger, fustigation, etc **Nursery and Seed Production: -** Introduction: Importance of Nursery and seed production, selection of site for open and covered culture. Soil preparation, soil sterilization, propagating structures, preparation of soil mixture for seed sowing and pot plants. Seed production methods for

		55. Studying propagation by runners, suckers, off shoots & other vegetative means.	pure seed, open seed, cross pollinated seed and hybrid seed, harvesting, cleaning, seed testing, germination test and packing. Seedling production methods for annuals and other herbaceous ornamentals and their methods of packing. Selection of Nursery sites & structures.
Professional Skill 65 Hrs. Professional Knowledge 18 Hrs	Identify and apply method of vegetative propagation and its management.	56. Studying the propagating materials -their harvesting and storing etc. 57. Preparing of Nursery plants by various vegetative methods & their maintenance. 58. Practicing simple and tongue layering, ground layering, air layering or gootee. 59. Practicing leaf cutting and leaf bud cutting. 60. Transplanting of rootstock for preparing grafts. 61. Practicing various budding methods on different root stock at different times. 62. Harvesting different types of seed. 63. Repotting of pot bound plants Pinching, disbudding and application of growth regulators. 64. Studying Bonsai plants, containers and methods of making, preserving, watering, disease and pest,	Bulb Corm production and storage methods for Gladiolus, Tuberose, Freesia, Dahlia, Amaryllis, Begonia, Glaxonia, Football Lily, Day lily, Spider lily and other lilies, Crinum, Daffodil and Narcissus, Iris, Caladium, Tulip, Carinas and Zephyr lily etc. Methods of harvest, protection, storage and packing. **Pot Plants:** Important foliage plants. Flower plants, Cacti, Succulents, Palm, Conifers and their methods of propagation, maintenance and packing. **Lawn grasses:** Seed and turf for plains, hills and coastal regions. Seed and turf production and their methods of packing and supply. **Landscape plants:** Trees, Shrubs, Climbers, ground covers. Hedge and edge plants, bamboos. Rock plants, ater plants and their propagation and packing methods. Method of production of

		packing etc. 65. Grading of container grown plants. 66. Studying packing of seed, seedlings, rooted cuttings pot plants, Lawn grass, Trees, Shrubs - Cacti, Bonsai. 67. Studying different types of boxes used for packing. Planting Materials and their Cultivation Practices 68. Method of identifying major types of ornamental plants. 69. Flowering (Trees, Shrubs, Climbers, Cacti, Succulents, 70. House plants etc.) 71. Pruning and shaping of the plants. 72. Identification of indoor and bonsai plants. 73. Other cultural practices like planting time and distances. 74. Methods of planting, nutrition, irrigation &plant protection. 75. Culture of Pot plants. 76. Identification of weeds and their control. 77. Making of herbaceous and shrubbery borders.	Herbaceous rooted cuttings/suckers- Chrysanthemum, Carnation, Dahlia, Gerbera, and Anthurium etc. Methods of production of budded/ grafted plants - Rose, Bougainvillea, Hibiscus. **Bonsai:** Importance, Criteria for selection of plants, various steps in Bonsai & forest. Methods of making Bonsai containers and soil potting & repotting. Training, pruning and punching; watering, manuring, pest and diseases and their control & methods of packing. Importance of identification and classification. Description of the categories of ornamental plants, lawns, pot plants, cut flower crops, bulbous plants, annuals and other bedding plants, rock garden plants and aquatic plants. **Cultural practices:** soil and climate, land preparation and planting, manuring, irrigation and other intercultural operations. Control of insect pests, diseases and weeds. Detailed study (plant height, shape and spread; flower colour, time and blooming duration foliage/fruit/bark beauty, hardiness, deciduous/evergreen) and uses of important species of each

			category wherever applicable. **Landscape plants:** a) Trees, b) Lawn, c) Shrubs, d) Hedges, e) Edges, f) Climbers, g) Pot plants, h) Cut flower crops, i) Annuals and other bedding plants, j) Bulbous plants, k) Flock gardens, 1) Aquatic plants etc.
Professional Skill 140 Hrs. Professional Knowledge 42 Hrs	Identify Commercial Flowers and their packaging.	78. Identification and study of important commercial varieties of the flowering crops. 79. Preparation of ground and beds for planting specific flower crops. 80. Top dressing (application of fertilizers for specific flower crops). 81. Pinching and disbudding in specific flower crops. 82. Providing support and training for specific crops. 83. Use of growth regulators. 84. Preparation of solutions and applications. 85. Study of packing materials – wrapping and tying materials, packing cartons.	Scope, importance, cultivars, soil and climatic requirements, propagation, nutrition and water management, management of insect pests, diseases and weeds, specific cultural operations, harvesting, grading, pulsing, storage. Packing of the following commercially important flowers: **For lose flowers:** Jasmines, Chrysanthemums, Rose, Crossandra, Barleria, Balsam, Marigold, China aster, Tuberose, Garenias, Dahlia, Hibiscus. **<u>For long stem cut flowers:</u>** **Perennials:** Rose, Gladiolus, Carnation, Gerbera Chrysanthemums. Orchids, Anthuriums, Water lilies, Freesia, Iris, Lilium amaryllis, Tulip, Hyacinth, Tuberose, Haemanthus, Dahlia, Narcissus, Hemerocallis Sterlitzia, Helicormia. **Annuals :** Antirrhinum, Aster, Delphinium, Dianthus, Centauria, Celosia, (Cockscomb) Helichrysum,

			Gazenia, Statice Gomphrena, Stock, Candytuft, Gypsophila. **Cut Greens:** Asparagus, Ferns, Grevillea, Callistemon, Solidago, Palms, Cycad, Thuja, Lemon grass; Prunus, Russelia. Specific cultural requirements for certain crops (Chrysanthemum, Carnation, Rose, Marigold) such as pinching, disbudding, regulation.
Professional Skill 90Hrs. Professional Knowledge 24 Hrs.	Identify the diseases and apply the pesticide as per requirement.	86. Identification of pests and diseases. 87. Preparation of solutions and application of sprays or dusts. 88. Study of quality parameters for cut flowers for domestic markets and for export. 89. Study of pulsing solutions and holding of cut flowers. 90. Harvesting, conditioning and storage of cut flowers. 91. Packing of cut flowers for local and out station markets and for export. 92. Study of poly houses, net houses, tunnels etc. for cultivation under cover, and preparation of estimates and plans. 93. Control of temperature, humidity, and light in covered structures. 94. Preparation of flowers for display for flower shows.	Scheduling/forcing of flowering, use of growth regulators. Cultivation under cover such as Poly & Net Houses and specific requirements of control of light temperature & humidity for flower crops such as Chrysanthemum, Carnation, Rose, Orchids.

		95. Visit to Commercial Nurseries, cut flower production Enterprises, Flower Shows, Flower Markets.	
Professional Skill 140 Hrs. Professional Knowledge 42 Hrs.	Plan and execute Survey for landscaping and various types of indoor gardening.	**Landscaping & Indoor Gardening** 96. Tours, surveying and drafting. 97. Preparation and execution of landscape plants. 98. Maintenance of gardens and lawns. 99. Accessories and containers for Flower arrangements. 100. Floral arrangement. 101. Preparation of floral ornaments, bouquets etc. 102. Preparation of bottle gardens, terrarium etc. 103. Maintenance and recycling of indoor pot plants.	Importance and scope. History & styles of gardens, famous gardens. Application of elements and principles. Features and components of gardens. Home gardens and garden structures. Enrichment items and right lighting. Soil, water and energy conservation through Landscaping. Selection of plants based on landscape value and uses. Maintenance of gardens and lawns. Avenue trees. Indoor gardens, terrace gardens, window gardens, trough/bottle garden, aquarium, baskets, mini landscape, Rock Gardens. Selection and arrangements of indoor pot plants, their care and recycling. Preparation of Garden competitions and Flower shows. Preparation for Floral ornaments – Garlands, Bangles, Crowns, Veni, Rangoli; baskets and bouquets, button holes,

			corsages. Principles and styles of flower arrangement, characteristics of Oriental, Western and Japanese (Ikebana) arrangements. Conditioning of cut flowers and cut greens form arrangement. Drying of plant material and selection of additional items used in flower arrangements. Prolonging self-life of Vase flowers.
Professional Skill 20Hrs. Professional Knowledge 06 Hrs.	Carry out Protected cultivation of flower.	104. Protected Cultivation of flowers. 105. Identification and study of poly house, shed net house, mulching.	Poly house, shed net house, mulching.
Project work/ Industrial visit			

SYLLABUS FOR CORE SKILLS
1. Employability Skills (Common for all CTS trades) (120 Hrs)

Learning outcomes, assessment criteria, syllabus and Tool List of Core Skills subjects which is common for a group of trades, provided separately in www.bharatskills.gov.in/ www.dgt.gov.in

ANNEXURE-I

List of Tools & Equipment			
FLORICULTURE & LANDSCAPING (For batch of 24 Candidates)			
S No.	**Name of the Tools and Equipment**	**Specification**	**Quantity**
A. TRAINEES TOOL KIT			
1.	Kassi / Spade		25 nos.
2.	Khurpi		25 nos.
3.	Hand hoe		25 nos.
4.	Saw		25 nos.
5.	Watering Can		06 nos.
6.	Rose Can		06 nos.
7.	Grass Cutter		25 nos.
8.	Budding & Grafting Knives		12 nos.
9.	Secateur		12 nos.
10.	Forceps		06 nos.
11.	Buckets		12 nos.
12.	Edge Cutter		02 nos.
13.	Tree Pruner		02 nos.
	Farm Structures		
14.	Green House		01 no.
15.	Poly House		01 no.
16.	Misting Unit		01 no.
B. FARM EQUIPMENT			
17.	Power Triller with Bowing Attachment		01 no.
18.	Wheel Barrow		01 no.
19.	Hand Sprayer (Small)		07 nos.
20.	Foot Sprayer		02 nos.
21.	Hand Gloves		20 nos.
22.	Balance		01 no.
23.	Sieve / Stainer		02 nos.
24.	Grass Mower		01 no.
C. LABORATORY EQUIPMENT			
25.	Refrigerator		01 no.

	Glass Wares		
26.	Beakers		05 nos.
27.	Measuring Cylinder		05 nos.
D. CHEMICALS GROWTH REGULATORS			
28.	G.A.		01 bottle
29.	N.A.A.		01 bottle
30.	LA. A.		01 bottle
31.	I.B.A.		01 bottle
32.	Routine Hormone		01 bottle
	Identification Materials		
33.	Flower Germ Plasm		As required
34.	Seed material		As required
35.	Packing materials		As required
E. ACCESSORIES FOR FLOWER ARRANGEMENT			
36.	Different types of flower containers		As required
37.	Flower vases		As required
38.	Pin holder		As required
	Laboratory Misc. Supplies		
39.	Duster		20 nos.
40.	Soap		20 nos.
41.	Cotton balls		10 nos.
42.	Filter paper (Packs)		10 nos.
43.	Filter cloth		10 mtrs.
	Compact Disc		
44.	Educational CD		01 no.
45.	Manual Extractor/4 Frame Radial Extractor		01 no
46.	Honey Tank with Filter	50 Kg /100 kg- Stainless Steel	01 no.
47.	Uncapping Tray		01 no.
48.	Cold Uncapping Knife (Left)- Scalloped Edge -Stainless Steel/Cold Uncapping Knife (Right)-Stainless Steel		05 nos.
49.	Honey Processor		01 set
50.	Tap Strainer - Stainless Steel		02 nos.
51.	Bee Box	ISI A-Type (8 frame)	02 nos.
52.	Plunger Marking Cage, Press in Marking Cage, Clip Type Queen Cage, Queen Travelling and Introduction Cages		01 no

53.	Combined Veil and smoker		01 no each
54.	Pair of Leather Gloves		03 nos
55.	Contact Feeder,	4 liter capacity	10 nos
56.	Lightweight J-type Hive Tool		10 nos
57.	Queen Gate		20 nos
58.	Queen Excluder		03 nos
59.	Drone Trap		03 nos
60.	Thermometer	Fahrenheit	02 nos.
61.	Steel container		03 nos
62.	Stove	Kerosene / Gas	01 no.
F. DESCRIPTION OF ITEM, MISCELLANEOUS FARM SUPPLIES			
63.	Earthen Pots		100 nos.
64.	Plastic Pots		100 nos.
65.	Polythene Bags		500 nos.
66.	Seed Packets		1000 nos
67.	Brown paper bags		1000 nos.
68.	Gunny bags		10 nos.
69.	Tags-labels		100 nos
70.	Thread balls		12 nos.
71.	Budding-tape		10 nos.
72.	Sirki		10 nos.
73.	Bamboos		20 nos.
74.	Boxes (Packing)		10 nos.
75.	Sutli		05 kgs.
76.	Moss-grass		05 kgs
77.	Polythene roll		01 no.
78.	Tags-label	Metallic	100 nos.
79.	Tray		10 nos
G. METEOROLOGICAL INSTRUMENTS			
80.	Rain gauge		01 No
81.	Max-Min Thermometer		01 No
82.	Dry & Wet Bulb		01 No

Note: -

1. *All the tools and equipment are to be procured as per BIS specification.*

ANNEXURE-II

The DGT sincerely acknowledges contributions of the Industries, State Directorates, Trade Experts, Domain Experts, trainers of ITIs, NSTIs, faculties from universities and all others who contributed in revising the curriculum.

Special acknowledgement is extended by DGT to the following expert members who had contributed immensely in this curriculum.

List of Expert Members participated for finalizing the course curriculum of Floriculture & Landscaping.			
S No.	**Name & Designation Sh/Mr./Ms.**	**Organization**	**Remarks**
1.	Ranjan Kumar Das Mohapatra, Dy. Director of Horticulture	Dept. of Horticulture, Mayurbhanj	Chairman
2.	L.K. Mukherjee, DeputyDirector	CSTARI, Kolkata	Member
3.	Dr. KeshabaCharana Panda, Principal	HDF Gramin ITC, Mayurbhanj	Member
4.	SudershanMohanty, Dy.Director Agriculture	Dept. of Agriculture, Mayurbhanj	Member
5.	Jagannath Patra, Programme Co-ordinator	KrushiVigyan Kendra, Mayurbhanj	Member
6.	Sarat Chandra Sethy, District Agriculture Officer	Dept.of Agriculture, Betnoti	Member
7.	Sudam Kumar Nayak, Plant Protection Officer	Dept.of Agriculture, Betnoti	Member
8.	Ch. Swapan Ku. Mohapatra, Director	HDF Gramin ITC, Mayurbhanj	Member
9.	Sudarshan Das, Secretary	HDF, Bhubaneswar	Member
10.	Bhupati Kumar Patra, Vice Principal	HDF Gramin ITC, Mayurbhanj	Member
11.	Bijay Ku. Das, Lecturer	HDF Gramin ITC, Mayurbhanj	Member
12.	SachindraDalabehera, Lecturer	HDF Gramin ITC, Mayurbhanj	Member
13.	Dr. Ranjay Ku. Giri, Lecturer	HDF Gramin ITC, Mayurbhanj	Member
14.	Pradeep Chandra Das, Lecturer	HDF Gramin ITC, Mayurbhanj	Member

15.	ShubhadeepBera, Co-Ordinator	HDF Gramin ITC, Mayurbhanj	Member
16.	BishnupadaBhowmick, Lecturer	HDF Gramin ITC, Mayurbhanj	Member
17.	SanghamitraPattanayak, Scientist Hort.	KrushiVigyan Kendra, Mayurbhanj	Member
18.	Dr. SoumenPalit, Principal	Green Field Agrotech Pvt. ITI, PaschimMedinipur, West Bengal	Member
19.	Samiron Banerjee, Trade Instructor	Green Field Agrotech Pvt. ITI, PaschimMedinipur, West Bengal	Member

ABBREVIATIONS

CTS	Craftsmen Training Scheme
ATS	Apprentice ship Training Scheme
CITS	Craft Instructor Training Scheme
DGT	Directorate General of Training
MSDE	Ministry of Skill Development and Entrepreneurship
NTC	National Trade Certificate
NAC	National Apprentice ship Certificate
NCIC	National Craft Instructor Certificate
LD	Loco motor Disability
CP	Cerebral Palsy
MD	Multiple Disabilities
LV	Low Vision
HH	Hard of Hearing

ID	Intellectual Disabilities
LC	Leprosy Cured
SLD	Specific Learning Disabilities
DW	Dwarfism
MI	Mental Illness
AA	Acid Attack
PwD	Person with disabilities