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

COMPETENCY BASED CURRICULUM

NURSERY & ORCHARD TECHNICIAN

(Duration: One year)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 3.5

SECTOR – AGRICULTURE

Directorate General of Training

NURSERY & ORCHARD TECHNICIAN

(Traditional Trade)

(Designed in 2024)

Version: 1.0

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 "Nursery & Orchard Technician' 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 trainees understand the diversity within the profession of nursery & orchard management, manage effectively a plant nursery, including tasks such as seed propagation, plant care, pest management to produce and maintain healthy, high-quality plants. Apply various methods of plant propagation, seed sowing, cuttings, grafting and division to produce new plants, maintain genetic diversity and contribute to sustainable plant cultivation and horticultural practices. They understand and identify different diseases and pests required for mitigate the same. The trainees plan, install different irrigation systems, Water lifting systems and perform different methods of irrigation, analyze Soil water holding capacity, Different methods and ingredient used for correction of Saline soil for improvement of fertility of soil. The trainees apply integrated nutrient Management system (INMS) in the field and prepare Bio- fertilizers. Also, Identify the role of major and minor plant nutrients and its deficiency symptoms. Develop the Cultivation techniques and methods of different fruits. Identify and select different Vegetative propagation method and perform propagation techniques of cutting, grafting, budding and layering. The trainees perform Cultural Management of a Fruit Plantation in Orchard by practicing various pruning activity and interpret marketing of Horticulture produces.

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 programs 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.

Nursery & Orchard Technician trade under CTS is one of the newly designed courses. The CTS courses are delivered nationwide through network of ITIs. The course is of one-year duration. It mainly consists of Domain area and Core area. In the Domain area (Trade Theory & Practical) impart professional skills and knowledge, while Core area (Employability Skills) imparts requisite core skill, knowledge and life skills. After passing out the training program, the trainee is awarded National Trade Certificate (NTC) by DGT which is recognized worldwide.

Trainee needs to demonstrate broadly that they are able to:

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

2.2 PROGRESSION PATHWAYS

- Can join industry as nursery technician and will progress further as Senior Nursery technician, Supervisor and can rise up 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 Crafts Instructor Training Scheme (CITS) in the trade for becoming an instructor in ITIs.
- 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.

4	On the Job Training (OJT)/ Group Project	150
5	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 are 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 assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scarp/wastage as per procedure, behavioral attitude, sensitivity to 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 examination 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 with occasional guidance and showing due	• Demonstration of good skill in the use of hand tools, machine tools and

regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.	workshop equipment • 60-70% accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A fairly good level of neatness and consistency in the finish • Occasional support in completing the project/job.
(b)Marks in the range of above75% - 90% to be allotted during assessment	
For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship.	• Good skill levels in the use of hand tools, machine tools and workshop equipment • 70-80% accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A good level of neatness and consistency in the finish • Little support in completing the project/job
(c) Marks in the range of above 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 in the use of hand tools, machine tools and workshop equipment • Above 80% accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.

3. JOB ROLE

Cultivator, Fruit; Farmer, Fruit grows varieties of nuts and fruits depending on type of soil, climate, irrigational and transport facilities. Determines type of nuts or fruits to be grown based on nature of soil, climatic conditions and irrigational facilities. Selects and purchases seeds, seedlings, cutting, etc. fertilizer and agricultural equipment required for cultivation. Prepares land for planting by ploughing, manuring, levelling, etc. Plants seedlings and cuttings or sow seeds and irrigates fields. Arranges regular supply of water by digging channels to source of water. Prepares manure for use in cultivation by storing farm yard refuse to get converted into usable manure. Weeds and hoes grass and prunes branches of fruit plants by hand tools to facilitate better growth and yield. Sprays insecticide and evolves measures to protect fruits from wild animals, etc. Checks maturity of fruits and plucks ripe fruits by hand at appropriate time. Develops different varieties of trees by grafting, budding, etc. Transports plants and fruits by carts or automobile and sells them. Hires labourers when needed and supervises their work. Keeps fences, building and agricultural tools and implements in good condition. May prepare seedbeds and raise seedlings for own use and for sale. May specialize in cultivating any particular type of fruit. May arrange preservation of fruits in cold storage. May specialize in grafting or budding.

Reference NCO-2015:

a) 6111.0800 - Cultivator, Fruit

Reference NOS:

a) AGR/N9445
b) AGR/N9446
c) AGR/N9447
d) AGR/N9448
e) AGR/N9449
f) AGR/N9450
g) AGR/N9451
h) AGR/N9452
i) AGR/N9453
j) AGR/N9454
k) AGR/N9455
l) AGR/N9456
m) AGR/N9457
n) AGR/N9458
o) AGR/N9459
p) AGR/N9460

4. GENERAL INFORMATION

Name of the Trade	**NURSERY & ORCHARD TECHNICIAN**
NCO – 2015	6111.0800
NOS covered	AGR/N9445, AGR/N9446, AGR/N9447, AGR/N9448, AGR/N9449, AGR/N9450, AGR/N9451, AGR/N9452, AGR/N9453, AGR/N9454, AGR/N9455, AGR/N9456, AGR/N9457, AGR/N9458, AGR/N9459, AGR/N9460
NSQF Level	Level-3.5
Duration of Craftsmen Training	One year (1200 hours + 150 hours OJT/Group Project)
Entry Qualification	Passed 10th class examination
Minimum Age	14 years as on first day of academic session.
Eligibility for PwD	LD, LC, DW, AA, LV, DEAF, AUTISM, SLD
Unit Strength (No. Of Student)	20 (There is no separate provision of supernumerary seats)
Space Norms	500 Sq. m of Farming Land
Power Norms	2 KW
Instructors Qualification for	
(i) Nursery & Orchard Technician Trade	B.Voc/ Degree in Agriculture/ Horticulture from recognized university with one-year experience in the relevant field. OR Two years diploma in Horticulture/ Agriculture from recognized board of education with two years' experience in the relevant filed. OR NTC/NAC passed in Horticulture/ Nursery & Orchard Management/ Floriculture and Landscaping with three years' experience in the relevant field. OR Registered nursery & orchard technician of Central/State govt. with 05 years experience. **Essential Qualification:** Relevant Regular/ RPL variants of National Craft Instructor Certificate (NCIC) under DGT. **Note: - Out of two Instructors required for the unit of 2 (1+1), one must have Degree/Diploma and other must have NTC/NAC Qualification or Registered Artisan. 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 & 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 nursery & orchard management following safety precautions. (NOS: AGR/N9445)
2. Manage effectively a plant nursery, including tasks such as seed propagation, plant care, pest management to produce and maintain healthy, high-quality plants. (NOS: AGR/N9446)
3. Apply various methods of plant propagation, including seed sowing, cuttings, grafting and division to produce new plants, maintain genetic diversity and contribute to sustainable plant cultivation and horticultural practices. (NOS: AGR/N9447)
4. Perform Temperate Fruit Growing and Perform Fruit Plant Nursery Raising. (NOS: AGR/N9448)
5. Plan and establish an Orchard and Perform General Cultural Practices related to soil. (NOS: AGR/N9449)
6. Identify different diseases and pests required for mitigate the same. (NOS: AGR/N9450)
7. Plan, install different irrigation systems, Water lifting systems and of water quality and perform different methods of irrigation. (NOS: AGR/N9451)
8. Analyze Soil water holding capacity, Different methods and ingredient used for correction of Saline soil also visit Field for identification of soil problems. (NOS: AGR/N9452)
9. Plan and execute different soil correction method through drainage and agronomic practices. (NOS: AGR/N9453)
10. Measure Soil fertility and apply soil Fertility management for improvement of fertility of soil. (NOS: AGR/N9454)
11. Apply integrated nutrient Management system (INMS) in the field and identify, prepare and apply Bio- fertilizers. (NOS: AGR/N9455)
12. Identify the role of major and minor plant nutrients and its deficiency symptoms. (NOS: AGR/N9456)
13. Develop the Cultivation techniques and methods of different fruits. (NOS: AGR/N9457)
14. Identify and select different Vegetative propagation method and perform propagation techniques of cutting, grafting, budding and layering. (NOS: AGR/N9458)
15. Perform Vines, Nuts and Berries culture, execute different mulching methods. (NOS: AGR/N9459)

16. Perform Cultural Management of a Fruit Plantation in Orchard by practicing various pruning activity and interpret marketing of Horticulture produces. (NOS: AGR/N9460)

6. ASSESSMENT CRITERIA

LEARNING OUTCOMES	ASSESSMENT CRITERIA
1. Identify metrological instruments and understand the diversity within the profession of nursery & orchard management following safety precautions. (NOS: AGR/N9445)	Identify meteorological instruments.
	Install instruments for measurement of Rainfall/ Temperature/ Humidity/ Wind direction and speed/ Evaporation/ Sunshine hours.
	Recording of Rainfall/ Temperature/ Humidity/ Wind direction and speed/ Evaporation/ Sunshine hours.
	Record meteorological data.
	Follow General Safety, Occupational health and hygiene.
2. Manage effectively a plant nursery, including tasks such as seed propagation, plant care, pest management to produce and maintain healthy, high-quality plants. (NOS: AGR/N9446)	Perform Nursery layout design.
	Perform Seed sowing / seedling management.
	Select Potts and container.
	Setup Irrigation system and maintenance.
	Identify and manage pests and diseases.
3. Apply various methods of plant propagation, including seed sowing, cuttings, grafting and division to produce new plants, maintain genetic diversity and contribute to sustainable plant cultivation and horticultural practices. (NOS: AGR/N9447)	Perform Seed sowing and germination.
	Perform Stem and leaf cuttings.
	Apply Grafting and budding techniques.
	Perform Tissue culture.
	Perform Inventory management and labelling.
4. Perform Temperate Fruit Growing and Perform Fruit Plant Nursery Raising. (NOS: AGR/N9448)	Identify Terminology used in horticulture.
	Perform Horticulture activity for growing Pome fruits, stone fruits, Nuts, Berries, Citrus etc
	Horticulture activity for the Flower: - morphology, pollination, fruit set.
	Identify Types of Fruit: - simple, aggregate, multiple
	Sow seeds, seedlings, Grafted plants.

	Perform Multiplication of rootstocks (clones) Trench layering/ Mound layering/ Air Layering etc
	Perform Propagation of fruit Plants- Scion, stock, scion sock relationship and their identification/ Budding grafting, Micro-grafting compatibility of stock- Scion in special reference to Pome, stone, nuts, barriers etc.
	Execute Management of fruit plants in the nursery, Weeding, Hoeing, Irrigation, De- shooting, Pinching
5. Plan and establish an Orchard and Perform General Cultural Practices related to soil. (NOS: AGR/N9449)	Identify Considerations when Establishing an Orchard.
	Perform Site Selection; size, location, climate, water, pest and disease exposure etc.
	Identify Effective Rainfall required for Establishing an Orchard.
	Draw an Orchard Plan.
	Identify Soils properties.
	Identify Physical Soil Characteristics; soil texture, structure, etc.
	Measure Chemical Characteristics of Soil; pH, Nutrition.
	Measure Soil Water level.
	Perform Simple Soil Tests.
	Dealing with Fruit Tree Problems.
	Identify Problem such as Pest diseases, Fungal diseases, Viral diseases.
6. Identify different diseases and pests required for mitigate the same. (NOS: AGR/N9450)	Interpret Integrated Pest Management (IPM).
	Perform Organic farming in special reference to Vermi-compost production and its prospectus.
	Chemical Pest Control and Non-Chemical Pest Control.
	dealing with Common Environmental Problems.
	Perform Weed Control: - (cultural and Chemical control)
7. Plan, install different irrigation systems, Water lifting systems and of water quality and perform different methods of irrigation. (NOS: AGR/N9451)	Identify different methods of irrigation.
	Identify quality of irrigation water required.
	Measure wate water loss during irrigation.
	Control water loss by applying various techniques.
	Install micro and pressure irrigation systems.
	Perform irrigation through micro and pressure irrigation systems.
	Demonstrate drainage systems.
	Identify macro and micro nutrients.
	Identify deficiency symptoms of plant nutrients.

	Show remedy of deficiency symptoms of plant nutrients.
8. Analyze Soil water holding capacity, Different methods and ingredient used for correction of Saline soil also visit Field for identification of soil problems. (NOS: AGR/N9452)	Measure water holding capacity of soil.
	Identify field problems.
	Apply method of correction of acid soil by application of various materials such as lime/ calcium oxide/ Calcium hydroxide/ Dolomite/ Calcium carbonate/ Calcium sulphate
9. Plan and execute different soil correction method through drainage and agronomic practices. (NOS: AGR/N9453)	Apply methods of Corrections through improvement of drainage, flushing, leaching and scrapping.
	Apply methods to combat the salinity problems.
	Adopt different agronomic practices such as ridge and furrow methods of sowing and irrigation.
	Perform correction Methods through application of Sulphur and Gypsum – frequency and rate of application.
	Identify role of organic matter in soil and its recycling - Collection and use of biofertilizers.
10. Measure Soil fertility and apply soil Fertility management for improvement of fertility of soil. (NOS: AGR/N9454)	Identify and select Soil Fertility, Fertilizers, Manures & Soil Fertility Management.
	Demonstration of Integrated Nutrient.
	Analyse and apply Organic matter, fertilizers and soil amendments, crop rotation.
	Adopt appropriate cropping systems for maintenance of soil fertility.
11. Apply integrated nutrient Management system (INMS) in the field and identify, prepare and apply Bio-fertilizers. (NOS: AGR/N9455)	Interpret Integrated Nutrient Management System (INMS) in the field.
	Follow occupational health hazards and safety related to the trade.
	Identify seeds of Green Manuring. Crops.
	Identify Different Green Manuring crops.
	Identify of bio- fertilizers.
	Bio- fertilizers preparation, application and techniques.
12. Identify the role of major and minor plant nutrients and its	Symptoms of nutrient elements.
	Identification of fertilizers and Micronutrient containing

deficiency symptoms. (NOS: AGR/N9456)	chemicals.
	Apply fertilizers and manures by various means.
13. Develop the Cultivation techniques and methods of different fruits. (NOS: AGR/N9457)	Perform cultivation of fruits, Management of orchards.
	Prepare seed bed, sowing of seeds, seed treatment, watering, transplanting.
	Ensure Protection against adverse environment.
	Perform Management of seed bed.
	Preparation of individual and group plots: Planning/ Making layout/ Planting/ Aftercare/ Digging of pit/ Enrichment of soil/ Refilling of pits/ Planting/ Watering etc.
14. Identify and select different Vegetative propagation method and perform propagation techniques of cutting, grafting, budding and layering. (NOS: AGR/N9458)	Perform Vegetative Propagation- Study and practice of propagation techniques of different types of plants.
	Interpret about plant hormones.
	Apply propagation techniques: Cutting/ Air layering/ Ground layering/ Inarch grafting/ Veneer grafting/ Stone grafting/ Patch budding/ Chip budding/ T-budding (with diagrams).
15. Perform Vines, Nuts and Berries culture, execute different mulching methods. (NOS: AGR/N9459)	Interpret Nut Growing.
	Perform Walnut Culture in detail
	Perform Almond cultivation
	Apply different methods of Mulching.
16. Perform Cultural Management of a Fruit Plantation in Orchard by practicing various pruning activity and interpret marketing of Horticulture produces. (NOS: AGR/N9460)	Develop a Maintenance Program.
	Perform The Production Plan.
	Marketing Options of horticulture produces.
	Conduct Market Research.
	Pruning and training system in different fruits plants. Central leader, open center and modified systems etc.

SYLLABUS FOR NURSERY & ORCHARD MANAGEMENT TRADE			
DURATION: ONE YEAR			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
Professional Skill 20 Hrs.; Professional Knowledge 10 Hrs.	Identify metrological instruments and understand the diversity within the profession of nursery & orchard management following safety precautions.	1. Identify 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. Carryout installation of the above instruments. 4. Record 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 Kharif crops and field preparation and sowing of Rabi crops. 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 20 Hrs.;	Manage effectively a plant nursery,	7. Demonstrate nursery layout and design.	• Principles of plant nursery management

Professional Knowledge 10 Hrs.	including tasks such as seed propagation, plant care, pest management to produce and maintain healthy, high-quality plants.	8. Carryout seed sowing and seedling management. 9. Perform potting and container selection. 10. Setup irrigation system and carryout maintenance. 11. Identify and manage pests and diseases.	• Propagation methods in plant nurseries • Soil preparation and potting techniques • Irrigation and fertilization practices • Pest and disease control measures in the nursery
Professional Skill 20 Hrs.; Professional Knowledge 10 Hrs.	Apply various methods of plant propagation, including seed sowing, cuttings, grafting and division to produce new plants, maintain genetic diversity and contribute to sustainable plant cultivation and horticultural practices.	12. Practice seed sowing and germination. 13. Practice Stem and leaf cuttings 14. Practice grafting and budding techniques. 15. Tissue culture laboratory practices. 16. Perform inventory management and labelling.	• Methods of plant propagation • Seed sowing techniques and seedling management • Cutting propagation and grafting techniques • Tissue culture and micro-propagation • Nursery inventory management
Professional Skill 60 Hrs.; Professional Knowledge 15 Hrs.	Perform Temperate Fruit Growing and Perform Fruit Plant Nursery Raising.	**Introduction to Temperate Fruit Growing** 17. Identify Terminology used in horticulture. 18. Perform horticulture activity for growing Pome fruits, stone fruits, Nuts, Berries, Citrus etc 19. Practice Horticulture activity for the Flower: - morphology, pollination, fruit set. 20. Identify Types of Fruit:- simple, aggregate, multiple	• Introduction to horticulture • Scope of horticulture • Principles of Horticulture for growing Pome fruits, stone fruits, Nuts, Berries, Citrus etc • The Flower: - morphology, pollination commercial flower, fruit set. • Types of Fruit: - simple, aggregate, multiple. • Terminology in horticulture
		Fruit Plant Nursery Raising 21. Sow seeds, seedlings, Grafted plants/ root stocks of different fruit plants.	• Sowing of seeds, seedlings, Grafted plants • Multiplication of different fruit plants rootstocks

		22. Perform Multiplication of rootstocks (clones) • Trench layering • Mound layering • Air Layering etc 23. Perform Propagation of fruit Plants • Scion, stock, scion sock relationship and their identification • Budding grafting, Micro-grafting compatibility of stock- Scion in special reference to Pome, stone, nuts, barriers etc. 24. Execute Management of fruit plants in the nursery, • Weeding, Hoeing, Irrigation, De- shooting, Pinching	(clones) ➢ Trench ➢ layering ➢ Mound ➢ layering ➢ Air Layering etc • Propagation of fruit Plants ➢ Scion, stock, scion sock relationship and their identification ➢ Budding grafting, Micro-grafting compatibility of stock-Scion in special reference to Pome, stone, nuts, barriers etc. • Management of fruit plants in the nursery, ➢ Weeding, Hoeing, Irrigation, De- shooting, Pinching
Professional Skill 60 Hrs.; Professional Knowledge 15 Hrs.	Plan and establish an Orchard and Perform General Cultural Practices related to soil.	**Establishing an Orchard** 25. Identify Considerations when establishing an Orchard. 26. Perform Site Selection; size, location, climate, water, pest and disease exposure etc. 27. Identify Effective Rainfall required for Establishing an Orchard. 28. Draw an Orchard Plan.	• Considerations when Establishing an Orchard • Site Selection; size, location, climate, water, pest and disease exposure etc • Effective Rainfall ➢ Drawing an Orchard Plan
		General Cultural Practices 29. Identify Soils properties. 30. Identify Physical Soil Characteristics; soil texture, structure, etc. 31. Measure Chemical Characteristics of Soil; pH, Nutrition. 32. Measure Soil Water level. 33. Perform Simple Soil Tests. 34. Practice Dealing with Fruit	• Understanding Soils • Physical Soil Characteristics; soil texture, structure, etc • Chemical Characteristics of Soil; pH, Nutrition • Soil Water • Simple Soil Tests • Dealing with Fruit Tree Problems • Identifying a Problem • Pest diseases

		Tree Problems. 35. Identify Problem such as Pest diseases, Fungal diseases, Viral diseases.	• Fungal diseases • Viral diseases
Professional Skill 60 Hrs.; Professional Knowledge 15 Hrs.	Identify different diseases and pests of major fruit crops required for mitigate the same.	**Pests and integrated Pest Management System of major fruits crops** 36. Demonstrate Integrated Pest Management (IPM). 37. Perform Organic farming in special reference to Vermi-compost production and its prospectus. 38. Practice Chemical Pest Control and Non-Chemical Pest Control. 39. Practice dealing with Common Environmental Problems. 40. Perform Weed Control: - (cultural and Chemical control)	• Integrated Pest Management (IPM) • Organic farming in special reference to vermi compost production and its prospectus • Chemical Pest Control • Non-Chemical Pest Control • Common Environmental Problems • Weed Control (cultural and Chemical control)
Professional Skill 75 Hrs.; Professional Knowledge 15 Hrs.	Plan, install different irrigation systems, Water lifting systems and of water quality and perform different methods of irrigation.	**Irrigation and Drainage -** 41. Practice different methods of irrigation. 42. Identify quality of irrigation water required. 43. Measure water loss during irrigation. 44. Control water loss by applying various techniques. 45. Install micro and pressure irrigation systems. 46. Practice irrigation through micro and pressure irrigation systems. 47. Practice drainage systems.	• Irrigation: Its need, irrigation types, Methods of application, appliances. • Quality water irrigation. • Study of water loss during irrigation. • Loss of irrigation water in different ways. Methods of prevention of such loss. • Micro Irrigation system – Drip, Sprinkler and other methods. • Drainage – need, type and control technique.
		Plant nutrients: - 48. Identify macro and micro nutrients.	• Plant nutrients: - macro and micro nutrients, their classification, identification, deficiency

		49. Identify deficiency symptoms of plant nutrients. 50. Practice remedy of deficiency symptoms of plant nutrients.	symptoms and uses
Professional Skill 20 Hrs.; Professional Knowledge 10 Hrs.	Analyze Soil water holding capacity, Different methods and ingredient used for correction of Saline soil also visit Field for identification of soil problems.	51. Measure water holding capacity of soil. 52. Visit to acid soil and saline soil areas and identification of field problems. 53. Practice method of correction of acid soil by application of various materials such as (i) lime (ii) calcium oxide (iii) Calcium hydroxide (iv) Dolomite (v) Calcium carbonate (vi) Calcium sulphate	• Saline soils – Corrections through improvement of drainage, flushing, leaching, scrapping. • Methods to combat the salinity problems. Adoption of different agronomic practices such as ridge and furrow methods of sowing and irrigation, growing of salt tolerant crops.
Professional Skill 60 Hrs.; Professional Knowledge 15 Hrs.	Plan and execute different soil correction method through drainage and agronomic practices.	54. Practice methods of Corrections through improvement of drainage, flushing, leaching and scrapping. 55. Practice methods to combat the salinity problems. 56. Adopt different agronomic practices such as ridge and furrow methods of sowing and irrigation. 57. Practice correction Methods through application of Sulphur and Gypsum – frequency and rate of application. 58. Identify role of organic matter in soil and its recycling - Collection and use of biofertilizers.	• 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
Professional Skill 60 Hrs.;	Measure Soil fertility and apply soil Fertility	59. Identify and select Soil Fertility, fertigation, Fertilizers, Manures & Soil	• Soil fertility, productivity and its maintenance. Concept and practices of

Professional Knowledge 15 Hrs.	management for improvement of fertility of soil.	Fertility Management. 60. Practice of Integrated Nutrient. 61. Analyse and apply Organic matter, fertilizers and soil amendments, crop rotation. 62. Adopt appropriate cropping systems for maintenance of soil fertility.	INMS. • 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. • Depletion of Soil fertility: *(i)* Factors affecting such as leaching, run-off, chemical and biological fixation of nitrogen, de-nitrification, volatilization, crop removal. *(ii)* Maintenance of soil fertility: through adoption of cultural methods such as recycling or application of crop residue, ploughing, leveling, application of organic matter, fertilizers and soil amendments, crop rotation and adoption of appropriate Cropping systems.
Professional Skill 75 Hrs.; Profession al Knowledge 15 Hrs.	Apply integrated nutrient Management system (INMS) in the field and identify, prepare and apply Bio-fertilizers.	63. Interpret Integrated Nutrient Management System (INMS) in the field. 64. Follow occupational health hazards and safety related to the trade. 65. Identify seeds of Green Manuring. Crops. 66. Identify Different Green Manuring crops.	• Green manure – Role of Green Manuring in crop production. • Green manuring, its principles, methods and practices. • Different of Green Manure crops. • Cultivation of important Green Manuring crops such as Dhaincha, Kalai, Cowpea, Sunhemp, Glyricidia. • Green Manuring crops
		67. Identify of bio- fertilizers.	• Bio-fertilizer – ➢ Concept and

		68. Practice bio- fertilizers preparation, application and techniques.	classification. ➢ 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.
Professional Skill 20 Hrs.; Professional Knowledge 10 Hrs.	Identify the role of major and minor plant nutrients and its deficiency symptoms.	69. Symptoms of nutrient elements. 70. Identify fertilizers and micronutrient containing chemicals. 71. Practice application of fertilizers and manures by various means.	• Essential plant nutrient elements - Role of Major and Minor plant nutrient elements. Deficiency symptoms
Professional Skill 90 Hrs.; Professional Knowledge 30 Hrs.	Develop the Cultivation techniques and methods of different fruits.	72. Perform cultivation of fruits, Management of orchards. 73. Prepare seed bed, sowing of seeds, seed treatment, watering, transplanting. 74. Ensure Protection against adverse environment.	• Present situation of cultivation of different fruit crops like Mango, Banana, Pomegranate, Quince, Tree Tomato, Apricot, cherry, fig, loquat, Asian pear and nakh, Olive, Peach and Nectraine, plums and prunes Guava, Litchi, Pineapple, Coconut, Papaya, Ber, Apple, Grapes, Pear, Watermelon etc. Their climate needs, choosing varities, Pollination needs and winter chilling requirements.
		75. Perform Management of seed bed. 76. Preparation of individual and group plots: *(i) Planning* *(ii) Making layout* *(iii) Planting* *(iv) Aftercare*	• Special emphasis on the impact point – (Climate, Variety, planting materials, planting time, Spacing, Manures and fertilizers, Intercultural, Harvesting, Grading, Storage, Marketing, Yield, Economics)

		(v) Digging of pit *(vi) Enrichment of soil* *(vii) Refilling of pits,* *(viii) Planting,* *(ix) Watering etc.*	
Professional Skill 80 Hrs.; *Professional Knowledge 25 Hrs.*	Identify and select different Vegetative propagation method and perform propagation techniques of cutting, grafting, budding and layering.	77. Perform Vegetative Propagation- Study and practice of propagation techniques of different types of plants. 78. Demonstrate role of plant hormones in propagation and crop production.	• Different methods of vegetative propagation of fruits and flowers. • Study of plant hormones.
		79. Practice of propagation techniques: *(i)* Cutting *(ii)* Air layering *(iii)* Ground layering *(iv)* Inarch grafting *(v)* Veneer grafting *(vi)* Stone grafting *(vii)* Patch budding *(viii)* Chip budding. *(ix)* T-budding (with diagrams).	• Importance of vegetative Propagation. • Types: Cutting, Air layering, Ground layering, Inarch grafting, Veneer grafting, Stone grafting, Patch budding, Chip budding and T- budding (with diagrams)
Professional Skill 60 Hrs.; Professional Knowledge 15 Hrs.	Perform Vines, Nuts and Berries culture, execute different mulching methods.	**Vines, Nuts and Berries** 80. Demonstrate walnut Culture in detail. 81. Demonstrate almond cultivation. 82. Mulching and its different methods.	**Vines, Nuts and Berries** • Nut Growing Introduction • Walnut Culture in detail • Cultivation of almond in detail • Use of different types of mulching material in the orchards
Professional Skill 60 Hrs.; Professional Knowledge 15 Hrs.	Perform Cultural Management of a Fruit Plantation in Orchard by practicing various pruning activity and interpret marketing of Horticulture produces.	**Cultural Management of a Fruit Plantation in Orchard** 83. Develop Maintenance Program. 84. Develop the Production Plan. **Marketing Horticulture Produce** 85. Explore marketing options. 86. Conduct market research 87. Pruning and training system in different fruits plants.	• Developing a Maintenance Program • The Production Plan **Marketing Horticulture Produce** • Introduction • Marketing Options • Conducting Market Research

		88. Demonstrate central leader, open center, modified systems and high density training system.	Pruning and training system in different fruits plants.
Project work: **Broad Areas:** *(i) Different methods of irrigation, water lifting with all available devices.* *(ii) Quality of irrigation water, water conveyance.* *(iii) Control of water loss by various techniques.* *(iv) Micro and pressure irrigation systems.* *(v) Drainage systems.*			

Note: *The duration of Professional skills (Trade practical) and Professional knowledge (Trade theory) are indicative only. The Training Institute has the flexibility to adopt suitable training duration for effective training.*

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			
NURSERY & ORCHARD MANAGEMENT (for batch of 20 Candidates)			
S No.	**Name of the Tools and Equipment**	**Specification**	**Quantity**
A. TRAINEES TOOL KIT			
1.	Magnifying Glass		20 Nos.
2.	Apron		20 Nos
3.	Safety goggles		20 Nos.
4.	Hand gloves		20 Nos
5.	Safety shoes		20 Nos.
6.	Helmet		20 Nos
7.	Spade	With long and Short Handle	20 Nos.
8.	Kudali		20 Nos.
9.	Khurpi		20 Nos.
10.	Hand hoe		20 Nos.
11.	Secateur		20 Nos.
12.	Pruning Saw		20 Nos.
13.	Budding & Grafting Knives		20 Nos.
14.	Rake		20 Nos.
15.	Transplanting shovel		20 Nos.
B. Shop tools and instruments			
16.	Measuring Tape	50 mtr	2 Nos.
17.	Pocket pH meter		2 Nos.
18.	Rose Cane		10 Nos.
19.	a) Foot Sprayer		2 Nos.
20.	b) Hand Sprayer		2 Nos.
21.	c) Battery Operated Sprayer		2 Nos.
22.	Different types of ropes		20 Kg
23.	Different types of labels		50 Nos.
24.	Lawn mover		2 Nos.
25.	Pruning knives		5 Nos.
26.	Hedge shears		5 Nos.
27.	Physical balance		01 No.
28.	Physical balance & weight box		01 No.
29.	Sprinkler		10 Nos.
30.	Micro sprinkler Set		10 Nos.
31.	Drip irrigation Set		10 Nos.

32.	Fire Extinguisher		02 Nos.
33.	Fire Buckets		02 Nos.
34.	Rain gauge		01 No.
35.	Max-Min thermometer		02 Nos.
36.	Dry & wet bulb		02 Nos.
37.	Brush cutter		02 Nos.
38.	Engine power sprayer		02 Nos.
39.	Power Tiller/Weeder		01 No.
40.	Microscope(4x-1000x)		01 No.
41.	EC Meter		02 Nos
42.	Soil pH Meter		01 No.
43.	pH Test kit		02 Nos.
C. Raw Materials/ Consumables			
44.	Plastic bucket		10 Nos.
45.	Different fertilizer samples	N, P, K	05 Nos.
46.	Different Micronutrient Samples	Zn, Mg, Cu, Fe, B, Mo	10 Nos.
47.	Preserved Specimens of Pests and Diseases		20 Specimens
D. General shop outfit, furniture and Materials			
48.	Fire Extinguisher		01 No.
49.	Instructor Chairs		02 Nos.
50.	Instructor table		02 Nos.
51.	Stool		05 Nos.
52.	Steel Almirah		02 Nos.
53.	White board		01 No.
54.	White board marker		01 box
55.	Duster		05 Nos.
56.	Cotton cloth (duster)		05 Nos.
57.	Metal Rack	100cmX 150cm X 45cm	04 Nos.
58.	Lockers with 16 drawers standard size		02 Nos.
59.	Smart interactive board		01 No.
60.	Split AC (with Stabilizer)		As required
61.	Notebooks for trainees (theory and practical)		52 Nos. each
62.	Pencils, erasers, sharpeners		52 Nos. each
63.	Notice board		01 No.
64.	Wall clock		01 No.

Note: -

Internet facility is desired to be provided in the class room.

ANNEXURE-I

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 Nursery & Orchard Technician trade held on 01st & 02nd February, 2024 at Srinagar (Jammu & Kashmir).			
S No.	**Name & Designation**	**Organization**	**Remarks**
1.	Shri Sudershan Kumar – JKAS, Director	Skill Development - J&K	Chairman
2.	Shri Sanjay Kumar – ISDS, Director	CD, DGT - MSDE	Co-Chairman
3.	Shri G.C. Rama Murthy – ISDS, Joint Director	CD, DGT - MSDE	Member
4.	Shri Khan Farooq Ahmed, Joint Director	Skill Development, Kashmir	Member
5.	Shri G M Bhat, Joint Director	Skill Development, Jammu	Member
6.	Shri Mohd Shafi Bhat, Principal	Govt Women Polytechnic Srinagar	Member
7.	Shri V.K. Saksena – ISDS, DD	NSTI Jammu (Srinagar Extension)	Member
8.	Shri Mohd Ashraf Wani, Principal (Senior Scale)	Govt ITI Srinagar	Member
9.	Smt Foziya Yousuf Illahi, HOD	Govt Women Polytechnic Srinagar	Member
10.	Shri Ali Mohammad Khan, HOD	K.G. Polytechnic, Srinagar	Member
11.	Shri S. Bandyopadhyay – ISDS, AD	CD, DGT - MSDE	Member
12.	Shri Sajad Hussain Naqueeb, AD	DSD Office Srinagar	Member
13.	Shri Ravi Gupta, AD	DSD Office Srinagar	Member
14.	Shri Surinder Kumar, AD	Handicraft & Handloom Department, Kashmir	Member
15.	Shri Javid Ahmed Ganai, Principal	Govt ITI Baramulla	Member
16.	Shri Imran Wajahat, Principal	Govt ITI Anantnag	Member
17.	Shri Mubashir Hafiz Jan, Superintendent	Govt ITI Kangan	Member
18.	Shri Imtiyaz Ahmad Mir, Superintendent	Govt ITI Pattan	Member

19.	Shri Ishfaq Ahmad Reshi, Superintendent	Govt ITI K B Pora	Member
20.	Smt Ruchi, Superintendent	Govt ITI R S Pura	Member
21.	Shri P. K. Bairagi, TO	CSTARI - Kolkata	Member
22.	Shri B. K. Nigam, TO	CSTARI – Kolkata	Member
23.	Shri Nazir Ahmad, Tech. Asst.	JD Office Jammu	Member
24.	Shri Subhash Chander Sharma, Industry Expert	Handicraft & Handloom Department, Jammu	Member
25.	Shri Mir Ashraf Ahmad, Industry Expert	Handicraft & Handloom Department, Kashmir	Member
26.	Dr Azfar Nanda, Industry Expert	Horticulture Department Kashmir Division	Member
27.	Shri Rajeev Pandita, Industry Expert	Rural Artisan Welfare Society, Jammu (NGO)	Member
28.	Smt Nelofar Jan, Industry Expert	New Bhat Handicrafts, Srinagar	Member
29.	Shri Riyaz Ahmad, Industry Expert	New Bhat Handicraft, Srinagar	Member
30.	Shri Nayeem Ahmad Baba, Industry Expert	NCVET Assessment Agency	Member
31.	Shri Ashiq Hussain Reshi, Industry Expert	Govt ITI Shopian	Member
32.	Shri Zaqir Hussain Bhat, Industry Expert	Govt ITI K B Pora	Member
33.	Shri Sahil Sharma, Industry Expert	Govt ITI R S Pura	Member

ABBREVIATIONS

CTS	Craftsmen Training Scheme
ATS	Apprenticeship 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 Apprenticeship Certificate
NCIC	National Craft Instructor Certificate
LD	Locomotor 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


कौशलं बलम्