

Syllabus For Gardener Cum Nursery Operator

Course Name	Gardener Cum Nursery Operator
Sector	AGRICULTURE
Sub-Sector	Horticulture
Course Code	AGR/2023/GCNO/204
Level	3
Occupation	Gardener Cum Nursery Operator
Job Description	A Gardener cum Nursery Operator is responsible for the cultivation, maintenance and management of plants, trees and shrubs in a nursery setting. This role involves tasks such as planting seeds and cuttings, transplanting, watering, fertilizing and controlling pests and diseases.
Course Duration	Total Duration 270 hrs (T-60, P-120, OJT-60 and ES-30)
Trainees' Entry Qualification	Grade 10 OR Grade 8 with two year of (NTC/ NAC) after 8 th OR Grade 8 pass and pursuing continuous schooling in regular school with vocational subject OR 8th grade pass with 2 yrs relevant experience OR Previous relevant Qualification of NSQF Level 2 with one yr experience OR Previous relevant Qualification of NSQF Level 2.5 with 6 months experience
Trainers Qualification	CTS/ATS in Horticulture & Landscaping with 3 years experience in relevant field B.Sc. Agriculture/Horticulture with 2 years experience in relevant field. OR M.Sc. in Horticulture/Agriculture science with one year experience in relevant field

Structure of Course:

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs)
1	Care and maintenance of plants	Perform essential tasks related to plant care and nursery maintenance, fostering practical horticultural skills and responsibility.	10	20	30
2	Maintenance practices of nursery	Demonstrate the procedure to effectively preserve and enhance the health and vitality of plants within a nursery setting through proper care and maintenance practices.	10	20	30
3	Nursery	Manage a nursery facility and	10	20	30

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs)
	Operations and Plant Propagation.	successfully propagate plant materials using standard techniques, fostering expertise in horticultural practices.			
4	Landscape Component Design and Planning	Plan and create aesthetically pleasing and functional garden elements, incorporating principles of design, sustainability and landscaping expertise.	10	20	30
5	Garden Establishment and Maintenance	Establish, nurture and sustain a garden, ensuring its health, vitality, and aesthetic appeal through proficient horticultural practices.	10	20	30
6	Maintain Health and safety at the workplace	Apply safe working practice	10	20	30
7	Employability Skill	As per NCVET norms	30	--	30
8	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).		60	60
TOTAL:			90	180	270

SYLLABUS:**Module No. 1: Care and maintenance of plants**

Outcome- Perform essential tasks related to plant care and nursery maintenance, fostering practical horticultural skills and responsibility.

Theory Content:

1. Familiarization about healthy and non-healthy planting material (seed, bulb, seedling etc.).
2. Use different tools and equipments for different nursery operations.
3. Describe the application of different pots, polybags, pro tray in the nursery activities
4. Select appropriate types and size of containers to develop different types of Plant seedlings
5. Undertake soil sterilization- sterilization structures, Learn the ways to protect the seeds and seedlings after sowing from different insects, pests and diseases.
6. Maintain the microclimate of the nursery.
7. Explain different types and ways of packaging and transportation of seedlings
8. Exhibit different types of propagation techniques and propagate plants using these techniques
9. Describe importance of different structures like green house, poly house, shade house and assist in developing these structures.
10. Illustrate the procedure of transplanting and shifting of big plants and trees

Practical Content:

1. Identify different types of plants and seeds
2. Identify and demonstrate the use different types of tools and equipment used in a nursery
3. Select quality seeds by observation or seed testing for viability
4. Prepare land/soil before sowing seeds and seedlings
5. Prepare different types of seedbeds

6. Demonstrate the use of different pots, polybags, pro tray in the nursery activities
7. Demonstrate soil sterilization
8. Prepare growth regulators and growing mixture
9. Demonstrate sowing of seeds.
10. Demonstrate how to identify different pests, insects and diseases.
11. Produce and maintain microclimate in the nursery
12. Demonstrate the process of pinching, training, pruning, shaping the plants
13. Demonstrate the process of transplanting and shifting of big plants and trees.

Tools & Equipment needed:

Different types of seeds, bulbs, seedlings, cuttings, trowel, rake, spade, jute balls, perforated poly bags, shade net, pots, watering cans, hand cutter, long cutter, knapsack sprayers, baskets, seedling trays, cocopeat, ladders, wheel barrow, axe, hoe, broom, shears, hose pipes, sprinklers, Tags, paint, sign boards, bamboo sticks etc.

Module No. 2: Maintenance practices of nursery

Outcome: Demonstrate the procedure to effectively preserve and enhance the health and vitality of plants within a nursery setting through proper care and maintenance practices.

Theory Content:

1. Importance of nursery management and its objectives
2. Role of nurseries in horticulture and forestry
3. Classification of nurseries(Based on purpose, location and scale)
4. Differences between seedling nurseries, grafting nurseries and fruit nurseries.
5. Procedure of routine maintenance of nursery
6. Management of soil in nursery
7. Seed propagation methods. Tissue culture techniques and their significance
8. Procedure of watering of plants and proper drainage system to prevent logging.
9. Know about organic and inorganic pesticides and insecticides and timely spray to control infestation of insect, pests and diseases.
10. Carry out waste water treatment in an adequate manner as per instruction.
11. Identify seed sowing and pricking out and transplanting
12. Maintain inventory of number of plants, gardening tools and equipment's, undertake grading, packaging and transportation of planting materials
13. Identify and control of common nursery pests and diseases
14. Use integrated pest management techniques
15. Use transplanting techniques and its best practices

Practical Content:

1. Visit potential nursery sites and evaluate with the factors like sunlight, soil quality, water availability
2. Develop the layout plan for small nursery considering all the factors
3. Prepare nursey beds and demonstrate proper seed sowing techniques
4. Monitor germination and seedling growth.
5. Practice seed propagation by sowing seeds of different plant species.
6. Identify common weeds and practice weed removal techniques.
7. Layout of different irrigation systems of plants and proper drainage system.
8. Identify different organic and inorganic pesticides and insecticides.
9. Demonstrate the procedure to spray different pesticides.
10. Demonstrate the procedure to treat waste water as per instruction.
11. Demonstrate different planting methods.
12. Prepare inventory of number of plants, gardening tools and equipment's
13. Demonstrate different grading, packaging and transportation of planting materials
14. Explore pricing strategies for nursery products

Tools & Equipment needed:

Shovel, spade, trowel, rake, broom, hose pipe, sprinklers, pesticides, sprayers, long cutter, shears, cutters, axe, sickle, weeder, pit for dry leaves, jute and pvc bags etc.

Module No. 3: Nursery Operations and Plant Propagation.

Outcome: Manage a nursery facility and successfully propagate plant materials using standard techniques, fostering expertise in horticultural practices.

Theory Content:

1. Describe the importance of nursery operations
2. Explain the role of nurseries in plant production and horticulture
3. Describe garden crops as per soil & climatic conditions.
4. Classify nursery bed & seedlings and transplant the seedlings.
5. Prepare the root stocks and practice Propagation techniques.
6. Describe the procedure of cutting, grafting, budding and layering techniques.
7. Construct an infrastructure like shade house, green house, mist chamber, irrigation system.
8. Describe the soil mixtures and seed beds.
9. Explain Seed propagation methods and its advantages and disadvantages.
10. Describe Vegetative propagation methods (e.g., cutting, layering, grafting), suitability for various plant types.
11. Explain different irrigation methods (e.g., drip, sprinkler) and water requirements for different stages of plant growth.
12. Identify the importance of weeding and mulching.
13. Explain the common pests and diseases in nurseries and their management.
14. Identify the nutrient requirement for nursery plants and types of fertilizers and their application
15. Describe the environmental factors on nursery operation
16. Explain the method of record keeping and importance
17. Describe the plant propagation and its significance
18. Identify types of vegetative propagation (cutting, layering, grafting and budding)
19. Explain types of cuttings (softwood, hardwood, leaf)
20. Describe different methods of layering and the steps involved in layering
21. Outline the criteria for selecting plants for propagation.

Practical Content:

1. Prepare the nursery beds, following recommended dimensions and spacing
2. Demonstrate the techniques for soil preparation and sterilization.
3. Practice seed sowing in seed trays or nursery beds.
4. Transplant seedlings from seed trays to nursery beds, ensuring proper spacing.
5. Set up and operate irrigation systems such as drip irrigation or sprinklers.
6. Determine the water requirements for nursery plants and adjust irrigation schedules accordingly.
7. Mix and apply fertilizers to nursery plants based on their nutrient requirements.
8. Monitor the growth response of plants to fertilization
9. Maintain nursery records, including inventory, expenses, and growth data.
10. Show how to transplant the seedlings.
11. Prepare the root stocks and practice propagation techniques.
12. Describe the propagation techniques by cutting, grafting, budding and layering.
13. Construct the infrastructure like shade house, green house, mist chamber, irrigation system.
14. Demonstrate the process of the soil mixtures and seed beds.
15. Describe the water, growing media & nutrition requirement for garden crops.
16. Practice pest & disease management of garden crops.

Tools & Equipment needed:

Laptop, white board, marker, projector, Seedling Tray, sacks, polythene, watering cans and equipments, shade net, green house/shade house, plant labels, labellers, spade, khurpi etc.

Module No. 4: Landscape Component Design and Planning**Outcome:**

Plan and create aesthetically pleasing and functional garden elements, incorporating principles of design, sustainability and landscaping expertise.

Theory Content:

1. Understand the features of Garden.
2. Gain knowledge about the different types of Garden.
3. Plan for the Design and Layout of Gardens-making gate, lawn, shrubbery, flower beds, borders, paths, hedges, edges, steps, statues, fountains, bird paths, streams, pools, waterfalls, rockery, arches, pergolas, hanging pots, bird paths (features of gardening) etc.
4. Layout & prepare the lawn.
5. Layout of orchard, plant fruit plants in the field.
6. Understand the different components of garden.
7. Implement the techniques to beautify the gardens.

Practical Content:

1. Demonstrate the design of Garden.
2. Plan for the Design and Layout of Gardens-making gate, lawn, shrubbery, flower beds, borders, paths, hedges, edges, steps, statues, fountains, bird paths, streams, pools, waterfalls, rockery, arches, pergolas, hanging pots, bird paths (features of gardening) etc.
3. Layout & prepare the lawn.
4. Layout of orchard, plant fruit plants in the field.
5. Understand the different components of garden.
6. Implement the techniques to beautify the gardens.

Tools & Equipment needed:

Laptop, white board, marker, projector, spade, khurpi, shears, loppers, hedge cutters etc

Module No. 5: Garden Establishment and Maintenance

Outcome: Establish, nurture and sustain a garden, ensuring its health, vitality, and aesthetic appeal through proficient horticultural practices.

Theory Content:

1. Introduction to seasonal Gardening and Ground maintenance.
2. Understand the different planting and Culture of Floral Display.
3. Understand and perform the irrigation maintenance in the garden.
4. Practice Pest and Disease management.
5. Perform filed operations like Maintain Lawn and Turf, Mowing, Fertilizing, Weeding, Irrigation, Aeration and Renovation.
6. Gain knowledge about the different Plant and Culture of Trees, shrubs etc
7. Identify different fruit plants & ornamental plants.
8. Prepare pot mixtures, potting & repotting of plants. Prune shrubs, hedge, edge & topiary. Collect soil samples for soil analysis.
9. Identify vegetable seed, garden tools & implements.
10. Prepare Bordeaux mixture. Prepare spray solution, handling sprayers & dusters

Practical Content:

1. Demonstrate the process of conducting the different planting and Culture of Floral Display.
2. Demonstrate the irrigation system in the garden.
3. Practice Pest and Disease management.

4. Show how to maintain Lawn and Turf, Mowing, Fertilizing, Weeding, Irrigation, Identification of different fruit & ornamental plants.
5. Process for Preparation of pot mixtures, potting & repotting of plants.
6. Demonstrate the pruning of shrubs, hedge, edge & topiary.
7. Collection of soil samples for soil analysis.
8. Identification of vegetable seed, garden tools & implements.
9. Preparation of Bordeaux mixture.
10. Preparation of spray solution, handling sprayers & dusters

Tools & Equipment needed:

Laptop, white board, marker, projector, Hedge cutter, shears, loppers, sprayers, plant labels, pesticides, weedicides, fertilizers, water pumps and equipments, watering timers and controllers

Module No. 6: Maintain Health and safety at the workplace

Outcome: Apply safe working practice

Theory Content:

1. Introduction to maintain a clean & efficient workplace.
2. Render appropriate emergency procedures.
3. Practice first aid and general safety/ recommended safe practices.
4. Undertake basic safety checks before operation of all machinery and vehicles and report all potential hazard to the supervisor.
5. Identification and Use of all protective clothing and safety gears like safety belt, helmet, mask, goggles etc. while executing work like mowing the lawn, pruning trees, spraying insecticides and pesticides.
6. Following the instructions as told while using the tools and equipments.
7. Read and understand the hazardous use and contamination mentioned on the labels of pesticides/ fumigants etc.

Practical Content:

1. Check various areas of the workplace & clean.
2. Practice first aid and general safety/ recommended safe practices.
3. Demonstrate the basic safety checks before operation of all machinery and vehicles.
4. Demonstrate the use of emergency protective clothing and safety gears like safety belt, helmet, mask, goggles etc. while executing work like mowing the lawn, pruning trees, spraying insecticides and pesticides. Following the instructions as told while using the tools and equipments.
5. Read and demonstrate the hazardous use and contamination mentioned on the labels of pesticides/ fumigants etc

Tools & Equipment needed:

Laptop, white board, marker, projector, Sanitizer, Personal protective equipment Like: safety gloves, Safety boots, hairnet, First Aid Kit: Bandages, Adhesive bandages, Betadine Solution / ointment, Pain relief spray / ointment, Antiseptic liquid; Antidote, Phone directory, Search lights, fire extinguisher

Module No. 7 : Employability Skills (30 Hrs)

Introduction to Employability Skills

Duration: 1 Hour

1. Discuss the importance of Employability Skills in meeting the job requirements

Constitutional values - Citizenship

Duration: 1 Hour

2. Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen.
3. Show how to practice different environmentally sustainable practices

Becoming a Professional in the 21st Century *Duration: 1 Hours*

4. Discuss 21st century skills.
5. Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations.

Basic English Skills *Duration: 2 Hours*

6. Use appropriate basic English sentences/phrases while speaking

Communication Skills *Duration: 4 Hour*

7. Demonstrate how to communicate in a well -mannered way with others.
8. Demonstrate working with others in a team

Diversity & Inclusion *Duration: 1 Hour*

9. Show how to conduct oneself appropriately with all genders and PwD
10. Discuss the significance of reporting sexual harassment issues in time

Financial and Legal Literacy *Duration: 4 Hours*

11. Discuss the significance of using financial products and services safely and securely.
12. Explain the importance of managing expenses, income, and savings.
13. Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws

Essential Digital Skills *Duration: 3 Hours*

14. Show how to operate digital devices and use the associated applications and features, safely and securely
15. Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely

Entrepreneurship *Duration: 7 Hours*

16. Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges

Customer Service *Duration: 4 Hours*

17. Differentiate between types of customers
18. Explain the significance of identifying customer needs and addressing them
19. Discuss the significance of maintaining hygiene and dressing appropriately

Getting ready for apprenticeship & Jobs *Duration: 2 Hours*

20. Create a biodata
21. Use various sources to search and apply for jobs
22. Discuss the significance of dressing up neatly and maintaining hygiene for an interview
23. Discuss how to search and register for apprenticeship opportunities

Module No. 8 : OJT

Outcome: Work in real job situation with special emphasis on basic safety and hazards in this domain

Practical Content:

Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for 60 Hours.)

Learning Outcome – Assessment Criteria

Module No.	Outcome	Assessment Criteria
1	Perform essential tasks related to plant care and nursery maintenance, fostering practical horticultural skills and responsibility.	<p>After completion of this module students will be able to:</p> <ul style="list-style-type: none"> 1.1 Describe the scope & importance of nursery and garden 1.2 Identify the aesthetic value of garden 1.3 Recognize the features of a good nursery 1.4 Explain different types and phases of nurseries and their layout. 1.5 Differentiate a healthy & non healthy planting material 1.6 Select and use of important nursery and garden equipment's 1.7 Demonstrate about the routine procedure of cleanliness of nursery tool and equipment's 1.8 Explain the use of different growing containers, their proper size & sterilization of growing media 1.9 Describe the procedure for management & protection measures of nursery 1.10 Demonstrate about the different nursery structures and procedure to transplanting and shifting of planting materials
2	Demonstrate the procedure to effectively preserve and enhance the health and vitality of plants within a nursery setting through proper care and maintenance practices.	<p>After completion of this module students will be able to:</p> <ul style="list-style-type: none"> 2.1 Develop the layout plan for small nursery considering all the factors 2.2 Prepare nursery beds and demonstrate proper seed sowing techniques 2.3 Carry out routine nursery maintenance related activities 2.4 Describe proper irrigation and proper drainage system 2.5 Select and apply organic and inorganic pesticides and timely spray for their control measures. 2.6 Follow Strictly the planting schedules 2.7 Maintain the inventory of number of plants, tools and equipment's. 2.8 Explain grading, packaging and transportation of planting materials 2.9 Illustrate the procedure of waste material utilization through composting. 2.10 Maintain nursery records, including inventory, expenses, and growth data. 2.11 Create a digital or physical logbook for the nursery. 2.12 Calculate the cost of production for nursery plants.

Module No.	Outcome	Assessment Criteria
3	Manage a nursery facility and successfully propagate plant materials using standard techniques, fostering expertise in horticultural practices.	<p>After completion of this module students will be able to:</p> <p>3.1 Select a suitable nursery and garden crops</p> <p>3.2 Prepare nursery bed and transplant the seedlings</p> <p>3.3 Demonstrate the techniques for soil preparation and sterilization.</p> <p>3.4 Select of suitable rootstocks and practice propagation techniques</p> <p>3.5 Establish the physical infrastructure for nursery establishment</p> <p>3.6 Explain the irrigation methods for garden crops</p> <p>3.7 Prepare the root stocks and practice propagation techniques.</p> <p>3.8 Describe the propagation techniques by cutting, grafting, budding and layering.</p> <p>3.9 Construct the infrastructure like shade house, green house, mist chamber, irrigation system.</p> <p>3.10 Demonstrate the process of the soil mixtures and seed beds.</p> <p>3.11 Describe the water, growing media & nutrition requirement for garden crops.</p> <p>3.12 Practice pest & disease management of garden crops.</p>
4	Plan and create aesthetically pleasing and functional garden elements, incorporating principles of design, sustainability and landscaping expertise.	<p>After completion of this module students will be able to:</p> <p>4.1 Construct and establish a garden and nursery practically</p> <p>4.2 Layout & prepare the lawn.</p> <p>4.3 Layout of orchard, plant fruit plants in the field.</p> <p>4.4 Identify and select different types of Garden</p> <p>4.5 Design and layout of gardens with all its features</p> <p>4.6 Plan the layout of lawn and Layout of orchard and plant fruit in the field</p> <p>4.7 Identify and justify the different components of garden</p> <p>4.6 Implement the techniques to beautify</p>
5	Establish, nurture and sustain a garden, ensuring its health, vitality, and aesthetic appeal through proficient horticultural practices.	<p>After completion of this module students will be able to:</p> <p>5.1 Describe the procedure for the nursery and garden care and management</p> <p>5.2 Explain the different planting and culture of floral display.</p> <p>5.3 Outline the procedure for Nutrient management and soil amendment</p> <p>5.4 Illustrate the disease and pest management in nursery and garden.</p>

Module No.	Outcome	Assessment Criteria
		5.5 Explain Weed management 5.6 Identify and procedure of Training, pruning, trimming and shaping of nursery and garden plants. 5.7 Prepare pot mixtures and practice of potting & repotting of plants 5.8 Explain the procedure for preparing Bordeaux mixture, spray solution 5.9 Demonstrate the application of sprayers & dusters.
6	Apply safe working practice	After completion of this module students will be able to: 6.1 Practice first aid and general safety/ recommended safe practices 6.2 Reduce health hazards in the working place 6.3 Use safely hazardous chemical 6.4 Maintain sound occupational health 6.5 Follow the instruction for use of hazardous chemical, pesticides/ fumigants etc.
7	Employability Skill	As per NCVET guided curriculum
8	OJT	Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for 60 Hours.)

List of Tools, Equipment & materials needed for 30 Trainees (Practical)

SI No	Items Name	Specification	Qty
1	Laptop	Reputed Company	2 nos
2	Projector	Reputed Company	2 nos
3	Audio-visual aids	Reputed Company	2 nos
4	Water pumps	Reputed Company	2 nos
5	Secateurs	Carbon steel with Teflon coating	30 nos
6	Grafting-Budding Knife	Dual purpose and foldable	30 nos
7	Personal protection equipment kit	Gardening Gloves, Mask, Goggles	30 nos
8	Pruning shears	Sharp and ergonomic design	10 nos
9	Hedge shears	Well balanced and sharp	5 nos
10	Pruning saw	Sharp with comfortable grip	5 nos
11	Hand trowel	Sturdy and rust resistant	10 nos
12	Rakes	Garden rake and leaf rake	10 nos
13	Spades	Durable and light	10 nos
14	Wheel barrows	Good capacity and easy movement	4 nos

SI No	Items Name	Specification	Qty
1	Laptop	Reputed Company	2 nos
2	Projector	Reputed Company	2 nos
3	Audio-visual aids	Reputed Company	2 nos
4	Water pumps	Reputed Company	2 nos
15	Watering cans	10 or 5 l with rose tip	5 nos
16	Measuring tapes	Minimum 50m	2 nos
17	Shovel	Both with short and long handgrips	5 nos
18	Hand sprayer	2-3 L capacity	5 nos
19	Knapsack sprayer	15-18 L capacity either manual or battery operated	2 nos
20	Ladders,	Reputed Company	2 nos
21	Weighing balance	Reputed Company	2 nos
22	Planting trays and pots	Plug trays, earthen pots, tumblers etc.	Assorted
23	Mulch	Organic and plastic	As per need
24	Fertilizer	Different grades and combination	
25	Cocopeat,vermicompost and organic fertilizers	Authorized producer	
26	Planting material	Seeds, corm, bulb etc. of ornamental plants	
27	Pesticide and fungicide	Commercially popular products	
28	Weedicide	Different grades	
29	Decorative elements	Garen decoration elements	
30	Irrigation supplies	Drip and sprinkler setup	

Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr. Marks
Perform essential tasks related to plant care and nursery maintenance, fostering practical horticultural skills and responsibility.	AGR/0252/OC1	30	110
Demonstrate the procedure to effectively preserve and enhance the health and vitality of plants within a nursery setting through proper care and maintenance practices.	AGR/0252/OC2	30	110
Manage a nursery facility and successfully propagate plant materials using standard techniques, fostering expertise in horticultural practices.	AGR/0252/OC3	30	110
Plan and create aesthetically pleasing and functional garden elements, incorporating principles of design, sustainability and landscaping expertise.	AGR/0252/OC4	30	110
Establish, nurture and sustain a garden, ensuring its health, vitality, and aesthetic appeal through proficient horticultural practices.	AGR/0252/OC5	20	110
Apply safe working practice	AGR/0252/OC6	10	100

Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	AGR/0252/OC7	0	150
Employability Skill-30 Hrs	DGT/VSQ/N0101	50	0