DRAFT Syllabus For Rooftop Gardening

Course Name	**Rooftop Gardening**
Course Code	**STC - AGR/NSQF-2022/0236**
Occupation	Urban farmer
Job Description	The urban farmer is skilled in the basic principles of natural farming and is able to grow good quality food independent of synthetic or artificial chemical inputs. He/she is also skilled in all aspects of efficient garden design and management and thus is able to run a natural food production operation smoothly.
Anticipated Volume of Training	600 Hrs (Theory: 150 Hrs + Practical: 390 Hrs + Employability Skill: 60 Hrs.)
Trainees' Entry Qualification	Class 8 pass and pursing continuous regular schooling, OR Class 8 Pass with 1 year experience, OR Class 8 Pass + ITI, OR Class 10 Pass OR previous relevant qualification of NSQF Level 2 with 1 yr experience
Trainers Qualification	BSC AGRICULTURE/ HORTICULTURE/BOTANY/ ZOOLOGY / FORESTRY, 2 YEARS IN RELEVANT FIELD

Structure of Course:

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs)
1	**Introduction and rooftop gardening primer**	Summarize the importance of good soil and infer gross quality of a given soil sample.	10	15	25
2	**Fundamental garden design concepts**	Identify and analyze sectors of natural influence, identify local natural resources and create detailed garden maps using the aforementioned data.	30	100	130
3	**Fundamentals of plant biology and ecology**	Identify and interpret ecological interactions related to plants and apply the same in gardening design and planning.	40	80	130
4	**Critical gardening skills**	Plan and demonstrate harvesting of produce and seed from healthy plants grown sustainably using locally derived resources.	35	100	135

5	**Critical management skills**	Operate garden tools safely and correctly and demonstrate proper maintenance and management of the garden and its associated inventory.	30	100	120
		TOTAL:	145	395	540

Employability Skill: 60 Hrs

SYLLABUS:

Module No. 1: Introduction and rooftop gardening primer

Outcome

Summarize the importance of good soil and infer gross quality of a given soil sample.

Theory Content:

- Classroom etiquette and discipline. Importance of participation, attention and questioning.
- Importance of rooftop gardening in the current global scenario. Soil degradation – causes and global impacts.
- Basic Soil Theory – components (physical/biological/chemical) and structure.
- Gross characterization of soil quality/health.

Practical Content:

- Simple soil testing for sand/silt/clay proportion
- Gross characterization of soil quality/health by observation (Jar tests/water holding capacity test/aggregate size and quality analysis)

Module No. 2: Fundamental garden design concepts

Outcome

Identify and analyze sectors of natural influence, identify local natural resources and create detailed garden maps using the aforementioned data.

Theory Content:

- Basics of mapping in designing gardens
- Basics of weather overlays– sun-shade cycles, prevailing winds, monsoon winds, etc.
- Elements of good garden design – efficient utilization and modification of free natural resources (sun, wind, water).
- Efficient and cost-effective garden bed designs and placement; ensuring proper access, drainage, shade/sun, wind, etc.

Practical Content:

- Field visits to different gardens/organic farms (to develop aesthetic sense of design)
- Practicing adjoining techniques as assignments

Module No. 3: Fundamentals of plant biology and ecology

Outcome

Identify and interpret ecological interactions related to plants and apply the same in gardening design and planning.

Theory Content:

- Basic plant physiology; Plant nutrients; Identifying characters of a healthy plant
- Solar energy distribution in multi-layered farming systems and energy wastage in monocropping systems.
- Cooperation between plants and fungi/bacteria; basics of the rhizosphere; basics of nitrogen fixation.
- Basics of mycorrhizal network and nutrient/information transfer along the same.
- Trap plants/Volunteer plants/Pest repellant plants.
- Importance of pollinators in crop yield and pollinator attractor plants.
- Companion planting and intercropping.
- Importance of designing a diverse system.
- Pests and causes of increased pest populations; Biological pest control.
- Identification of plant diseases/deficiencies and methods of mitigating the same.

Practical Content:

- Demonstration of specimens/plants
- Field visits to different gardens.
- Audio-visual aid

Module No. 4: Critical gardening skills

Outcome

Plan and demonstrate harvesting of produce and seed from healthy plants grown sustainably using locally derived resources.

Theory Content:

- Importance of Carbon as a nutrient anchor; Nitrogen-Carbon ratios
- Composting methods, Broad-spectrum liquid soil amendment preparation methods. Utilization of local resources.
- Creating good soil by mixing different elements.
- Preparation of insect repellants using local resources.
- Plant selection for the garden; making plant calendars.
- Basics of preparing garden beds.
- Tools and implements related to gardening and their proper use.
- Methods of planting; preparing, maintaining nurseries and seedlings monitoring plant growth, identifying right time for harvest
- Maintaining plants – correct pruning, grooming, etc.
- Plant propagation techniques.
- Proper seed extraction and storage of seeds for next season.

Practical Content:

- Demonstration of adjoining theoretical techniques

Module No. 5: Critical management skills

Outcome

Operate garden tools safely and correctly and demonstrate proper maintenance and management of the garden and its associated inventory.

Theory Content:

- Wise selection of crops/varieties suitable for rooftop,
- Quality management issues,
- Organic approach of gardening,
- Designing a safe garden considering both architectural and engineering ways,
- Water management,
- High density planting and
- Consideration of gender during special/emergency training

Practical Content:

- Demonstration of proper tool use and maintenance
- Emergency training

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

Sl No	Items with description	Qty
1	Gardening gloves	30
2	Safety glasses	30
3	Gumboots/safety boots	30
4	Hats	30
5	Funnel (plastic/glass)	15
6	Stirrer (glass/plastic)	15
7	Measuring cylinder (plastic/glass) (100 mL, 500 mL, 1 L)	10 ea
8	Glass beaker	15
9	Test tubes	20
10	Forceps	20
11	pH strip packs	30
12	Secateurs	10
13	Sickle	10
14	Hose	5
15	Double sided rake and trowel	10
16	Sprayer (15L and 5L)	10
17	Watering cans with shower head	10
18	Trigger sprayer (1L or 500mL)	10
19	Weeder (double prong and single prong)	10 ea

Sl No	Items with description	Qty
20	Hand Cultivator	10
21	Long Handle cultivator	10
22	Shovel	10
23	Pickaxe	10
24	Hoe	10
25	Claw hammer, screwdriver, wrench and assorted common tools	5 ea
26	Baskets	15
27	Plastic crates	200
28	Pruning knives (long and short)	10 ea
29	Lopper	10
30	Garden knife	10
31	Auger	10
32	Hedge shears	10
33	Pitchfork	10
34	Drip irrigation system (50 Mtr)	10
35	Composting bin	5
36	Shade net (50% and 75%)	1000 sq ft
37	GI wire	10 kg
38	Bamboo poles/PVC poles	50
39	Grow tubs	200
40	Grow bags	500
41	Seedling tray	200
42	Ziploc bags	500
43	Cocopeat 5 kg blocks	30
44	Buckets with mug	15
45	Drum with lid	5
46	Jerry can (10L, 15L)	10 ea
47	Sieve (plastic/metal)	10
48	Brooms	30
49	Tarpaulin (UV treated)	10
50	Garbage bins (colored for waste segregation)	15
51	Garbage bags (preferably biodegradable)	300
52	Airtight Storage container (plastic/metal)	25
53	Silica gel	5 kg
54	Garden rope	1000 mtr
55	Aeration pump	5
56	Perforated polybag or biodegradable substitute	1000 pcs
57	Weighing scale (100 gm and 25 kg)	2 ea
58	Wheelbarrow	3
59	Lux meter	2
60	Water level/Laser level	5
61	Weather meter	5
62	Microscope (up to 100X preferable)	3
63	Glass slides (100 per pack)	10 packs
64	Glycerin or DPX	5
65	Dropper (Plastic/glass)	30
66	Fire extinguisher	5
67	First aid kit	10
68	Assorted stationery pack	30
69	Vermicompost	50 kg

Sl No	Items with description	Qty
70	Compost	50 kg
71	Soil	100 kg
72	Sand	100 kg