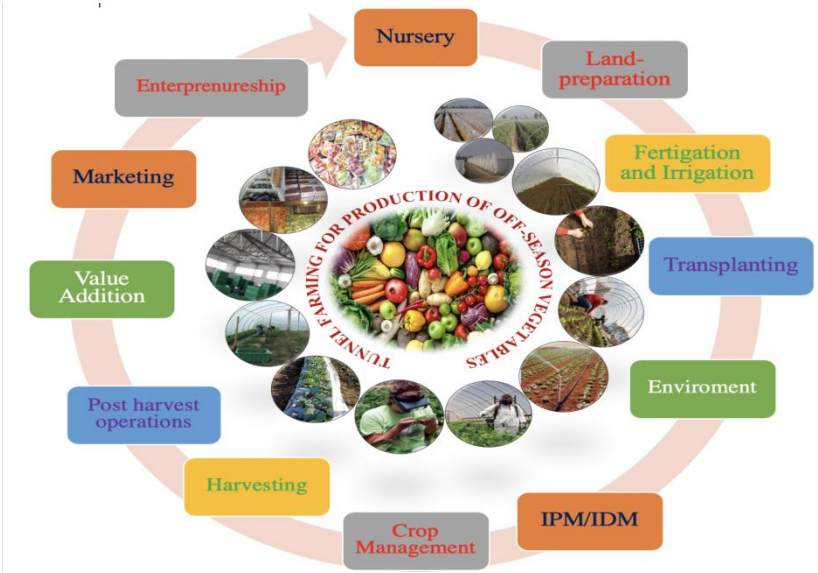
National Vocational Qualification level – 5

"Tunnel Farming, Green House & Agribusiness"

(Off-season Vegetable production & Agribusiness)



(Curriculum)

National Vocational and Technical Training Commission (NAVTTC)

Government of Pakistan

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1. Introduction

Agriculture is considered as the backbone of Pakistan's economy, which accounts for about 18.9% of Pakistan's GDP and employs about 42.3% of the labor force. Where agriculture is considered as the largest sector that supports GDP, horticulture sector (fruit and vegetables) contributes only 11 % to the total value addition. Pakistan exports vegetables to Afghanistan, Malaysia, Russia, Bahrain, UAE and Sri Lanka but not impressive figures. Despite favorable climatic and cropping condition Pakistan has repeatedly seen shortages of different vegetables like onions or tomatoes in the market that caused price rise and difficulty for many people. More than 35 varieties of vegetables are growing in different climatic zones in different provinces of Pakistan. Many Surveys reports different reasons for low production of vegetables in Pakistan. The government in history executed various projects to urge the farmer community for cultivation of vegetables but due to lack of technical skills and limited resources, farmers have not adopted this sector in a very impressive way.

Vegetable production can be heightening by improving cultivation techniques and enhancing profitability for farmers. Off-season vegetable production is also an important technique to enhance profits and meet market demand. Production of vegetables out of normal season through different techniques is called “off-season vegetable”. Growing Off-season vegetables not only provides fresh vegetables to the daily dietary meal of the consumers but also helps farmers to get abnormal profit as supply in the off-season is always lower than that of its demand.

Therefore, the importance of knowledge related to off-season vegetable production through the latest techniques makes this diploma very valuable not only in agriculture but also in its usefulness in all areas of our daily life. Market demands for qualified workers are therefore a need for time and can only be addressed by developing specific skills standards in partnership with all stakeholders and industry experts. Recognizing this fact, the National Vocational and Technical Training Commission (NAVTTC) has developed the National Vocational Qualifications Framework (NVQF) for tunnel farming, Greenhouse and agri. Business (off season vegetable production) qualifications. These competency standards have been developed by the Qualification Development Committee (QDC) and validated by the Qualification Validation Committee (QVC) with representation from the country's leading departments (IAGS, PU Lahore, UVAS, UAF, PCSIR and ARI KPK.

2. Purpose of the training program:

The aim of this qualification is to set high and applicable professional standards for all stake holders in agriculture sector. The basic goals of establishing these credentials are as follows:

1. Equip with the latest off-season vegetable production techniques
2. Improve trainees' professional competence
3. Provide opportunities for recognition of non-formal or informal skills
4. Raise standard and efficacy of scientific training and assessment
5. Improve crop production through the best management skills
6. Enable the existing workforce to learn new technologies and methods
7. Producing a skilled workforce for off-season vegetable production

3. Overall objectives of training program:

The main objectives of the Tunnel Farming, Greenhouse & Agribusiness (Level-5) are as follows:

1. Select suitable site for crop production
2. Prepare Layout Plan for Sowing
3. Perform soil sampling and check soil nutrient composition
4. Manage Soil Nutrients through Manuring
5. Prepare Land for Crop Production
6. Prepare beds/ridges for sowing
7. Perform transplanting and direct seeding
8. Perform Management Practices for Crop Production
9. Maintain Environment for Healthy crop
10. Obey the Workplace Policies and Procedures

11. Perform Integrated Pest Management (IPM)
12. Perform weeding
13. Perform Integrated Disease Management (IDM)
14. Handle harvested produce
15. Perform packaging of produce
16. Store Harvested produce
17. Maintain Records of produce
18. Perform Value addition of produce
19. Market products and services
20. Sale harvested produce
21. Develop entrepreneurial skills
22. Apply management and communication techniques
23. Create human resource management plan
24. Develop project management plan
25. Develop sales plan
26. Manage finances
27. Identify and resolve problems

4. Competencies to be gained after completion of course:

At the end of the course, the trainee has attained the following core competencies:

National Qualification in the Tunnel Farming, Greenhouse & Agribusiness (Level-5).

1. Select suitable site for crop production
2. Prepare Layout Plan for Sowing
3. Perform soil sampling and check soil nutrient composition
4. Manage Soil Nutrients through Manuring
5. Prepare Land for Crop Production
6. Prepare beds/ridges for sowing
7. Perform transplanting and direct seeding
8. Perform Management Practices for Crop Production
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10. Obey the Workplace Policies and Procedures
11. Perform Integrated Pest Management (IPM)
12. Perform weeding
13. Perform Integrated Disease Management (IDM)
14. Handle harvested produce
15. Perform packaging of produce
16. Store Harvested produce
17. Maintain Records of produce
18. Perform Value addition of produce
19. Market products and services
20. Sale harvested produce

5. Entry level of trainees:

The entry for National Vocational Certificate level 2, in "**Tunnel Farming, Greenhouse & Agribusiness**" are given below:

Title	Entry requirements
National Vocational Certificate level 5, in **Tunnel Farming, Greenhouse & Agribusiness**	Entry for assessment for this qualification is open. However, entry into formal training institutes, based on this qualification is candidate having **SSC and** National Vocational Certificate level 4, in **Tunnel Farming, Greenhouse & Agribusiness**

6. Minimum qualification of trainer/instructor:

- Must be a holder of Bachelor of Engineering in Agricultural Engineering/ B.Sc. (Hons.) Agriculture/equivalent or Bachelor of Technology in Agricultural Engineering (with three years of experience)
- Must be able to communicate effectively both orally and in written form.
- Must be able to perform all competences, given in **Tunnel Farming, Greenhouse & Agribusiness Level-5**

7. Recommended trainer: trainee ratio

The recommended maximum trainer: trainee ratio for this program is 1 trainer for 20 to 25 trainees.

8. Medium of instruction i.e. language of instruction:

Instructions will be in Urdu/ English/ Local language.

9. Duration of the course (Total time, Theory & Practical time):

The distribution of contact hours is given below:

Total - 1203 hours
Theory - 477 hours (39.651%)
Practical - 726 hours (60.349%)

10. Description and structure of the course

Following is the structure of the course:

Code	Competency Standard	Category	Theory	Practical	Total	Credit
CS53	Select suitable site for crop production	Technical	16	24	40	4
CS54	Prepare layout plan for sowing	Technical	8	12	20	2
CS55	Perform soil sampling and check soil nutrient composition	Technical	18	27	45	4.5
CS56	Manage soil nutrient through manuring	Technical	18	27	45	4.5
CS57	Prepare land for crop production	Technical	32	48	80	8
CS58	Prepare beds/ridges for sowing	Technical	32	48	80	8
CS59	Perform transplanting and direct seeding	Technical	24	36	60	6
CS60	Perform management practices for crop production	Technical	40	60	100	10
CS61	Maintain environment for healthy crop	Technical	15	27	42	4.2
CS62	Obey the Workplace Policies and Procedures	Technical	6	15	21	2.1

CS63	Perform Integrated Pest Management(IPM)	Technical	24	36	60	6
CS64	Perform Weeding	Technical	16	24	40	4
CS65	Perform Integrated Disease Management (IDM)	Technical	24	36	60	6
CS66	Handle harvested produce	Technical	16	24	40	4
CS67	Perform packaging of produce	Technical	24	36	60	6
CS68	Store Harvested produce	Technical	24	36	60	6
CS69	Maintain Records of produce	Technical	12	18	30	3
CS70	Perform Value addition of produce	Technical	32	48	80	8
CS71	Market products and services	Technical	24	36	60	6
CS72	Sale harvested produce	Technical	16	24	40	4
CS73	Develop entrepreneurial skills	Generic	8	12	20	2
CS74	Apply management and communication techniques	Generic	8	12	20	2
CS75	Create human resource management plan	Generic	8	12	20	2
CS76	Develop project management plan	Generic	8	12	20	2

CS77	Develop sales plan	Generic	8	12	20	2
CS78	Manage finances	Generic	8	12	20	2
CS79	Identify and resolve problems	Generic	8	12	20	2
	Total		**477**	**726**	**1203**	**120.3**
	Percentage (%)		**39.65087**	**60.34913**		

Level 5

Module 53: Select suitable site for crop production

Objective: After the completion of this module, the trainee will be able to select suitable site for crop production.

Duration: 40 Hours **Theory: 16 Hours** **Practice: 24 Hours** **Credit Hours: 4**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Prepare for site selection	**Trainee will be able to:** • Prepare visit plan of the proposed site as per requirements • Formulate Performa for collection of the site information • Identify and arrange tools according to visit plan • Ensure safety standards as per	• Define site for crop production. • Discuss criteria for site selection • Enlist the material/equipment used for site selection • Describe health and safety standards	**Theory-** 03 Hrs **Practical-** 04 Hrs **Total-** 07 Hrs	• Charts • Stationary • Measuring tape • GPS device • Cord • Tags • Compass • PPEs kit	Class room/workplace

	the job requirements	**Practical Activity:** Prepare work plan for site selection			
LU2. Collect site information for selection	**Trainee will be able to:** • Implement site visit plan • Calibrate the required instruments as per prescribed standards • Collect site data on prescribed format • Maintain record as per requirements • Ensure safety standards as per the job requirements	• Define topography • Explain the procedure of calibration of instruments required for site selection • Describe the operating procedure of instruments • Discuss climatic factors for site selection (rainfall, humidity, wind pressure, direction and temperature etc.) • Discuss health and safety standards **Practical Activity:** Make a group of 5 trainees and prepare checklist of existing	**Theory-** 04 Hrs **Practical-** 06 Hrs **Total-** 10 Hrs	• Charts • Stationary • Measuring tape • GPS device • Cord • Tags • Compass • PPEs kit	Field area/ Workplace,

		site features for tunnel crop			
LU3. Select the Site	**Trainee will be able to:** • Ensure prescribed method of data collection and analysis • Ensure required standard for quality of soil and water recommended for vegetable production • Ensure favourable geographical conditions for tunnel farming • Evaluate collected information • Maintain records according to set standards • Ensure health and safety standards	• Explain salient features of an ideal site • Describe principles and practices involved in site selection • Explain factors which are necessary for site selection (climatic factors, socio-economic factors, edaphic factors environmental factors, biotic factors and economic factors) • State the health and safety measures	**Theory-** 06 Hrs **Practical-** 10 Hrs **Total-** 16Hrs	• Charts • Stationary • Measuring tape • GPS device • Cord • Tags • Compass • Soil Auger • Polyethylene bags • Plastic baskets • Permanent marker • PPEs kit	Workplace/Field visit

		Practical Activity: Make a group of 5 trainees, conduct field visits, select an ideal site keeping in view the requirement of tunnel crop			
LU4. Prepare report	**Trainee will be able to:** • Compile analysed information according to prescribed format • Prepare report as per particular format • Manage records according to required standards • Submit report to concerned head/department	• Describe the report writing criteria • Explain all the aspects of selected site • Knowledge of record keeping and further correspondence **Practical Activity:** Prepare detailed report of visited site	**Theory-** 03 Hrs **Practical-** 04 Hrs **Total-** 07 Hrs	• Charts • Stationary • Measuring tape • Tags • PPEs kit	Class Room/workplace , Field visit

Module 54: Prepare Layout Plan for Sowing

Objective: After the completion of this module, the trainee will be able to develop skills and competencies required to understand and identify basic principles and procedures involved in lay out plan for sowing.

Duration: 20 Hours **Theory: 8 Hours** **Practical: 12 Hours** **Credit Hours: 2**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Prepare for layout work	**Trainee will be able to:** • Arrange tools for layout plan • Draw a layout • Ensure required safety standards	• Define layout • Enlist tools for layout • Discuss health and safety standards **Practical Activity:** Prepare a layout for sowing on chart/paper as per crop requirement	**Theory-** 03 Hrs **Practical-** 05 Hrs **Total-** 08 Hrs	• Stationery • Laptop • Cord • Measuring tape • Tags • PPEs Kit	Class Room/Work place

LU2. Prepare layout for sowing	**Trainee will be able to:** • Select standard dimensions and direction for furrows/ridges • Calculate number of beds/ridges as per standard dimensions • Identify irrigation and drainage according to available irrigation methods • Ensure safety standards involved in the process	• Mark the boundaries of selected site • Explain the dimension for furrows/ridges/beds and water courses keeping in view the direction of tunnel • Knowledge of lay out of furrows/ridges/beds and water courses as per irrigation method and crop • Describe the personnel health and safety measures **Practical Activity:** Prepare on farm layout for sowing of crop in tunnel	**Theory-** 05Hrs **Practical-** 07 Hrs **Total-** 12 Hrs	• Stationery • Cord • Measuring tape • Tags • PPEs Kit	Work place/Field area

Module 55: Perform soil sampling and check soil nutrient composition

Objective: After the completion of this module, the trainee will be able to develop skills and competencies required for soil sample collection, analysis and evaluation of nutrient requirements for off-season vegetable production.

Duration: 45 Hours **Theory: 18 Hours** **Practice: 27 Hours** **Credit Hours: 4.5**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place

LU1. Prepare for soil sampling	**Trainee will be able to:** • Identify and arrange required sampling tools • Ensure personal safety measures as per job requirement • Maintain phytosanitary conditions at site as per standards	• Define soil sampling and give its importance • Discuss soil sampling methods • Explain sampling process for collection of composite soil sample • Discuss health and safety guidelines **<u>Practical Activity:</u>** Draw a sketch for soil sampling.	**Theory-** 03 Hrs **Practical-** 05 Hrs **Total-** 08 Hrs	• PPEs Kit • Stationery • Permanent marker • Polyethylene bags • Soil augur • Plastic basket • Tags • Spade	Class Room/Workplace
LU2. Collect soil sample	**Trainee will be able to:** • Arrange tools for sampling as per requirements. • Collect sub-samples of given site as per random sampling techniques • Collect sub-samples of given	• Define composite sample and describe its characteristics • State the best time for soil sampling • Enlist tools/equipment for sol sampling • Explain different methods	**Theory-** 09 Hrs **Practical-** 13 Hrs **Total-** 22 Hrs	• PPEs Kit • Stationery • Permanent marker • Polyethylene bags • Soil augur • Plastic basket • Tags • Spade	Workplace/Field area

	site as per zone based sampling techniques • Collect sub-samples of given site as per grid sampling techniques • Collect sub-samples of given site as per stratified sampling techniques • Make composite sample according to standard method • Draw representative sample for laboratory testing • Transport sample to laboratory as per SOPs	of soil sampling • Elaborate the procedure of soil sampling • Knowledge of soil sampling from different depths (0-6", 6-12" and 12-24") as per crop requirement • Describe the criteria of packing and labeling • Discuss the personnel health and safety measures **<u>Practical Activity:</u>** Perform soil sampling and prepare composite soil sample for laboratory test			
LU3. Evaluate and implement	**Trainee will be able to:** • Collect report • Identify deficient and excess	• Discuss soil sampling report • Discuss the nutrient report	**Theory-** 06 Hrs **Practical-** 09 Hrs	• PPEs Kit • Stationery • Permanent marker • Tags	Class Room/Workplace

recommendations	nutrients as per prescribed standard • Adopt appropriate measures according to the report recommendations as per standard requirements • Monitor/Evaluate the results • Ensure health and safety standards	with supervisor • Discuss the recommendations of nutrients/fertilizers according to soil report • Describe health and safety measures **Practical Activity:** Make a group of 5 trainees and discuss soil analysis report and suggest recommendations	**Total-** 15 Hrs		

Module 56: Manage Soil Nutrients

Objective: After the completion of this module, the trainee will be able to develop skills and competencies required for soil nutrient management of tunnel vegetables.

Duration: 45 Hours **Theory: 18 Hours** **Practical: 27 Hours** **Credit Hours: 4.5**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Prepare for soil nutrient management	**Trainee will be able to:** • Identify and arrange tools required for nutrient management • Adopt precautionary measures regarding personnel health and safety as per standards • Prepare work plan for required task	• Define nutrients and give their importance for crop production • Discuss work plan for soil nutrient management • Discuss soil nutrient/fertilizer application based on the laboratory report recommendations **<u>Practical Activity</u>** Prepare work plan for soil	**Theory-** 04 Hrs **Practical-** 05 Hrs **Total-** 09 Hrs	• PPEs Kit • Stationery • Tags • First aid kit • Weigh balance	Class Room/workplace

		nutrient management			
LU2. Apply organic fertilizer	**Trainee will be able to:** • Select required organic fertilizers for manuring • Calculate the requirement of selected fertilizer as per standard • Perform application of organic fertilizers as per standards • Perform green manuring operation as per standard methods • Ensure health and safety standards involved in manuring	• Define organic fertilizer • State the benefits of organic fertilizers • Describe different organic fertilizers (Farmyard manure, green manure, leaf manure, compost, poultry manure etc.) • Discuss the calculation method of organic fertilizers based on soil analysis report • Explain the application methods of organic fertilizer • Discuss the personnel health and safety measures **Practical Activity:** Conduct field visits, make a group of five trainee to	**Theory-** 07 Hrs **Practical-** 11 Hrs **Total-** 18 Hrs	• PPEs Kit • Stationery • Tags • Weigh balance • Spade • Sieve • FYM • Poultry manure • Compost • Leaf manure	Workplace/Field area

		calculate and apply different organic fertilizers as per crop requirement			
LU3. Apply inorganic fertilizer	**Trainee will be able to:** • Identify and enlist the inorganic fertilizers • Calculate the amount and type of fertilizer as per recommendation in soil analysis report • Perform the application of fertilizer as per standard requirements • Ensure health and safety standards involved in manuring	• Define inorganic fertilizer • Enlist different inorganic fertilizers • Differentiate between simple and compound fertilizer • Discuss the calculation method of inorganic fertilizers based on soil analysis report • Describe the application methods of inorganic fertilizer (broadcasting, side dressing, foliar and fertigation) • Discuss the personnel	**Theory-** 07 Hrs **Practical-** 11 Hrs **Total-** 18 Hrs	• PPEs Kit • Stationery • Tags • Weigh balance • Spade • Sieve • Inorganic fertilizers	Workplace/Field area

		health and safety measures **Practical Activity:** Conduct field visits, make a group of five trainees to calculate and apply different inorganic fertilizers			

Module 57: Prepare Land for Crop Production

Objective: After the completion of this module, the trainee will be able to develop skills and competencies required for land preparation, mechanical operation, manual operation and implement soil conditioning measures for off-season vegetable production.

Duration: 80 Hours **Theory: 32 Hours** **Practical: 48 Hours** **Credit Hours: 8**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Plan for land preparation	**Trainee will be able to:** • Identify and arrange required tools and equipment for land preparation • Ensure availability of required Personal Protective Equipment (PPEs) as per the job requirements • Prepare plan for required tasks	• Discuss work plan for land preparation • Enlist different implements used for land preparation • State the personnel health and safety measures **Practical Activity:** Prepare layout plan for land preparation on charts	**Theory-** 04Hrs **Practical-** 07Hrs **Total-** 11 Hrs	• Stationery • PPEs Kit • Tags • Permanent markers • Cord	Class Room/Workplace

LU2. Perform mechanical operation for land preparation	**Trainee will be able to:** • Identify and arrange required mechanical tillage implements • Perform pre checks of required machinery • Perform required mechanical operation for land preparation as per standard method • Ensure health and safety standards as per SOPs	• Define mechanical land operation • Describe different mechanical implements used for land preparation (moldboard plough, disc harrow, chisel plough, disc harrow, rotavator, land leveler, bed shaper, ridger etc.) • Explain the working/operating principles of mechanical tillage implements • Describe personal health and safety measures as per requirement **<u>Practical Activity:</u>** Make a group of students to perform different mechanical	**Theory-** 09Hrs **Practical-** 14 Hrs **Total-** 23 Hrs	• Stationery • PPEs Kit • Tags • Permanent markers • Cord • Land leveler • Planker • Rotavator • Disc harrow • Chisel plough	Class Room/Workplace

		tillage implements			
LU3. Perform manual operation for land preparation	**Trainee will be able to:** • Identify and arrange required appropriate hand tools • Perform manual operations for land preparation as per standard method • Ensure health and safety standards involved in required tasks	• Define manual land operation • Enlist different manual implements used for land preparation • Discuss operating principle of different tools and implements used for manual land preparation • Describe personal health and safety measures **<u>Practical Activity:</u>** Make a group of students to perform different manual land preparation operations	**Theory-** 08Hrs **Practical-** 11 Hrs **Total-** 19 Hrs	• Stationery • PPEs Kit • Tags • Permanent markers • Cord • Manual plough • Jandra • Spade	Class Room/Workplace

LU4. Implement soil conditioning measures	**Trainee will be able to:** • Recognise ideal soil types for vegetable production • Maintain standard soil organic matter ratio according to standard procedure • Ensure soil aeration and water holding capacity as per standard requirements • Ensure soil is well drained • Ensure record keeping • Ensure health and safety standards	• Define sandy, loamy and clayey soils • State the characteristics of good soil for tunnel crops • Knowledge of organic matter and Carbon-Nitrogen(CN)ratio of soil • Define water holding capacity of soil • Discuss soil aeration and field capacity • Describe the suitable soil conditions for optimum plant growth • Describe personal health and safety measures **<u>Practical Activity:</u>** Make a group of 5 trainees and identify the ideal soil conditions of a particular site for tunnel	**Theory-** 06Hrs **Practical-** 09 Hrs **Total-** 15 Hrs	• Stationery • PPEs Kit • Tags • Permanent markers • Cord • Spade	Class Room/Workplace

		crops			
LU5. Perform post land preparation operations	**Trainee will be able to:** • Dispose of non-toxic waste and work debris as per farm policy and environmental standards. • Remove stones, sticks and debris as per standard criteria • Ensure health and safety standards	• Discuss post land preparation operations • State the importance of dispose-off different waste materials from field • Describe personal health and safety measures **Practical Activity:** Make a group of students to perform different post land preparation operations and enlist different collected waste material	**Theory-** 05 Hrs **Practical-** 07 Hrs **Total-** 12 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Permanent markers • Cord • Jandra • Spade •	Class Room/Workplace

Module 58: Prepare beds/ridges for sowing

Objective: After the completion of this module, the trainee will be able to develop skills and competencies required to understand and identify basic principles and procedure involved in beds/ridges making process for off season vegetable production.

Duration: 80 Hours **Theory: 32 Hours** **Practical: 48 Hours** **Credit Hours: 8**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Prepare work plan	**Trainee will be able to:** • Identify and arrange required tools for bed/ ridge preparation • Perform checks for quality work • Ensure required safety standards	• Define secondary tillage • Describe work plan for beds/ridges/furrows preparation as per crop requirement • Differentiate among seed beds/ridges/furrows • Discuss operating principle of implements/tools used for preparation of beds/ridges/furrows as per crop requirement	**Theory-** 08Hrs **Practical-** 12 Hrs **Total-** 20 Hrs	• Stationery • PPEs Kit • Tags • First aid box	Class Room/Workplace

		• State the health and safety standards **<u>Practical Activity:</u>** Prepare a layout on chart for preparation of ridges/beds/furrows as per crop requirement			
LU2. Prepare beds for sowing	**Trainee will be able to:** • Select required implements for bed preparation • Adjust implement according to required bed dimensions • Implement layout plan for beds • Ensure safety standards involved in the process	• Enlist different implements/tools required for beds preparation as per crop requirement • Explain the calibration of different implements/tools used for beds preparation • Knowledge of the layout for beds preparation as per crop requirement • Describe personal health and safety measures	**Theory-** 12 Hrs **Practical-** 18 Hrs **Total-** 30 Hrs	• Stationery • PPEs Kit • Tags • First aid box • Spade • Jandra • Bed shaper	Field area

		Practical Activity: Perform seed beds preparation as per tunnel crop requirement			
LU3. Prepare ridges for sowing	**Trainee will be able to:** • Select required implements for ridge preparation • Adjust implement according to required ridge dimensions • Implement layout plan for ridges • Ensure safety standards involved in the process	• Enlist different implements/tools required for ridges preparation as per crop requirement • Explain the calibration of implements/tools used for ridges preparation • Knowledge of the layout for ridges preparation as per crop requirement • Describe personal health and safety measures **Practical Activity:** Make a group of students to perform ridges preparation as per tunnel crop requirement	**Theory-** 12 Hrs **Practical-** 18 Hrs **Total-** 30 Hrs	• Stationery • PPEs Kit • Tags • First aid box • Spade • Jandra • Ridger	Field area

Module 59: Perform transplanting and direct seeding

Objective: After the completion of this module, the trainee will be able to develop skills and competencies required to understand and identify basic principles and procedure involved in nursery transplantation and direct sowing of different vegetables.

Duration: 60 Hours **Theory: 24 Hours** **Practical: 36 Hours** **Credit Hours: 6**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Prepare for transplantation	**Trainee will be able to:** • Identify and arrange required materials for transplantation of seedlings • Identify and arrange required materials for direct sowing • Prepare plan for required task • Ensure required safety standards	• Define transplantation • Differentiate between nursery transplantation and direct sowing • Discuss work plan for transplantation/direct sowing based on crop requirement • Enlist tools and implements required for transplantation/direct	**Theory-** 05 Hrs **Practical-** 08 Hrs **Total-** 13 Hrs	• Stationery • PPEs Kit • First aid box • Tag	Class Room/Workplace, Field area

		sowing • Discuss time of transplantation/direct sowing as per crop requirement • State the health and safety standards **Practical Activity:** Make a group of five trainees and prepare the checklist for transplantation/direct sowing based on tunnel crop requirement			
LU2. Transplant nursery seedlings of required crop	**Trainee will be able to:** • Identify and arrange required tools for transplantation • Perform mulching according to standard requirement • Ensure hardening of nursery	• Define mulching and its benefits • Enlist different mulch materials • Knowledge of hardening process of nursery seedlings before	**Theory-** 10 Hrs **Practical-** 14 Hrs **Total-** 24 Hrs	• Stationery • PPEs Kit • First aid box • Tag • Spade • Khurpa • Polyethylene bags • Hand driven trolley	Workplace/Field area

	seedling according to set standards • Prepare holes in mulch according to standard method • Ensure required environmental conditions for transplantation • Perform transplantation of nursery seedling according to standard procedure • Maintain records as per defined format • Ensure safety standards involved in transplantation	transplanting in field/tunnel • Describe the procedure of nursery transplantation • State the personal health and safety measures **Practical Activity:** Conduct a field visits and perform nursery transplantation for tunnel crop			
LU3. Perform direct sowing of required crop	**Trainee will be able to:** • Perform mulching according to standard requirement • Ensure required seed treatment according to set standards • Prepare holes in mulch according to standard method	• Discuss seed treatment and its benefits • Enlist seed treatment chemicals and their optimum doses as per crop requirement • Knowledge of ideal environmental conditions	**Theory-** 9 Hrs **Practical-** 14 Hrs **Total-** 23 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Spade • Khurpa • Ridger/bed shaper	Field area

	• Ensure required environmental conditions for sowing of required crop • Perform sowing operation of required crop according to standard procedure • Maintain records as per defined format • Ensure safety standards involved in sowing	for direct sowing as per tunnel crop requirement • Describe the procedure of direct sowing based on seed size and tunnel crop requirement • State personal health and safety measures **Practical Activity:** Conduct field visits and perform direct sowing of a tunnel crop			

Module 60: Perform Management Practices for Crop Production

Objective: After the completion of this module, the trainee will be able to develop skills and competencies required to perform different management practices *viz.,* Earthing up, thinning, training, pruning, staking, emasculation, pinching, deflowering and to maintain on farm phytosanitary conditions for tunnel crop production.

Duration: 100 Hours **Theory: 40 Hours** **Practical: 60 Hours** **Credit Hours: 10**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Prepare work plan	**Trainee will be able to:** • Identify and arrange tools for required management practices • Prepare plan for required task • Ensure required safety standards	• Enlist tools/equipment for the management practices of tunnel crop • Explain work plan for the management practices of crop production • Describe health and safety measures **Practical Activity:** Prepare plan of work for management practices of	**Theory-** 02 Hrs **Practical-** 03 Hrs **Total-** 05 Hrs	• Stationery • PPEs Kit • First aid box • Tags	Class Room/Workplace,

		tunnel crops			
LU2. Perform earthing-up	**Trainee will be able to:** • Identify and arrange tools for earthing-up • Perform earthing-up activity according to standard procedure • Ensure required safety standards • Maintain records	• Define earthing up • Enlist different tools required for earthing up • Explain the purpose and procedure of earthing up • Discuss record keeping of earthing up • State personal health and safety measure **Practical Activity:** Conduct field visit, make a group of 5 trainees and perform earthing up of a tunnel crop	**Theory-** 07 Hrs **Practical-** 10 Hrs **Total-** 17 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Spade • khurpa	Field area
LU3. Perform thinning	**Trainee will be able to:** • Identify and arrange tools for thinning activity • Perform Thinning activity	• Define thinning • Enlist different tools required for thinning • Describe the purpose and	**Theory-** 04Hrs **Practical-** 06 Hrs **Total-** 10 Hrs	• Stationery • PPEs Kit • First aid box • Tags	Field area

	according to standard procedure • Ensure required safety standards • Maintain records	procedure of thinning • Discuss record keeping of thinning • State personal health and safety measure **Practical Activity:** Conduct field visit, make a group of 5 trainees and perform thinning of a tunnel crop			
LU4. Perform training of plants in tunnel activity	**Trainee will be able to:** • Identify and arrange tools for training of required vegetable • Perform training activity on required crop according to standard procedure • Ensure required safety standards • Maintain records	• Define training of plants • Enlist different tools required for training of plants • Describe different types of training and their purpose • State the record keeping of training • Explain personal health and safety measure	**Theory-** 03 Hrs **Practical-** 05 Hrs **Total-** 08 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Cutter • Pruning scissor • Pruning shears • Pruning saw • Plastic net	Field area

		Practical Activity: Conduct field visit, make a group of 5 trainees and perform training of a tunnel crop			
LU5. Perform pruning to maintain healthy plant	**Trainee will be able to:** • Identify and arrange tools for pruning • Perform pruning activity according to standard procedure • Ensure required safety standards • Maintain records	• Define pruning • Enlist different tools required for pruning • Describe different types of pruning and their purpose • Discuss the record keeping of pruning • State personal health and safety measures **Practical Activity:** Make a group of 5 trainees and perform Pruning of a tunnel crop	**Theory-** 04Hrs **Practical-** 06 Hrs **Total-** 10 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Cutter • Pruning scissor • Pruning shears • Pruning saw	Field area

LU6. Perform staking	**Trainee will be able to:** • Identify and arrange material for staking • Perform staking process according to standard procedure • Ensure required safety standards • Maintain records	• Define staking • Enlist different materials used for staking • Enlist different tunnel crops which require staking • Discuss the record keeping of staking • State personal health and safety measures **Practical Activity:** Conduct field visit, make a group of 5 trainees and perform staking of a tunnel crop	**Theory-** 03 Hrs **Practical-** 05 Hrs **Total-** 08 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Bamboo sticks • Rope	Field area

LU7. Perform emasculation	**Trainee will be able to:** • Identify and arrange tools for emasculation • Perform emasculation activity	• Define emasculation and describe its purpose • Enlist different materials/tools used for	**Theory-** 07 Hrs **Practical-** 10 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Emasculation kit	Field area

	according to standard procedure • Ensure required safety standards • Maintain records	emasculation • Discuss the record keeping of emasculation • State personal health and safety measures **Practical Activity:** Conduct field visit, make a group of 5 trainees and perform emasculation of a tunnel crop	**Total-** 17 Hrs		
LU8. Perform pinching	**Trainee will be able to:** • Identify and arrange tools for pinching • Perform pinching activity according to standard procedure • Ensure required safety standards • Maintain records	• Define pinching and describe its purpose • Enlist different materials/tools used for pinching • Describe the benefit of pinching • Discuss the record keeping of pinching • State personal health and safety measures	**Theory-** 04 Hrs **Practical-** 05 Hrs **Total-** 09 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Cutter • Pincher • knife	Field area

		Practical Activity: Conduct field visit, make a group of 5 trainees and perform pinching of a tunnel crop			

LU9. Perform deflowering	**Trainee will be able to:** • Identify and arrange tools for deflowering • Perform deflowering activity according to standard procedure • Ensure required safety standards • Maintain records	• Define deflowering and describe its purpose • Enlist different materials/tools used for deflowering • Describe the benefits of deflowering • Discuss the record keeping of deflowering • State personal health and safety measures **Practical Activity:** Conduct field visit, make a group of 5 trainees and perform deflowering of a	**Theory-** 03 Hrs **Practical-** 05 Hrs **Total-** 08 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Cutter • Scissor • Tree tech snipper	Field area

		crop			
LU10. Maintain phytosanitary conditions	**Trainee will be able to:** • Maintain phytosanitary conditions according to standard procedure • Perform safe disposal of plant waste according to SOPs • Ensure required safety standards • Maintain records	• Define phytosanitary conditions • Describe different safe disposal methods of plant waste • State personal health and safety measures **<u>Practical Activity:</u>** Conduct field visit and develop a report of ideal phytosanitary conditions	**Theory-** 03 Hrs **Practical-** 05 Hrs **Total-** 08 Hrs	• Stationery • PPEs Kit • First aid box • Plastic bags • Plastic bins	Field area

Module 61: Maintain Environment for Healthy crop

Objective: After the completion of this module, the Trainee will be able to develop skills and competencies required to maintain environment for healthy crop.

Duration: 42 Hours **Theory: 15 Hours** **Practical: 27 Hours** **Credit Hours: 4.2**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Prepare work plan	**Trainee will be able to:** • Identify and arrange required tools for measuring environmental conditions • Perform calibration of instruments if required • Perform quality checks • Prepare plan for required task • Ensure required safety standards	• Differentiate between humidity and temperature • Discuss work plan to maintain environment for healthy crop • Enlist different tools/gadgets/equipment to maintain temperature and humidity in tunnel • Describe the procedure for	**Theory-** 02 Hrs **Practical-** 03 Hrs **Total-** 05 Hrs	• Stationery • PPEs Kit • First aid box • Tags • charts	Class room/Workplace

		calibration of tools/gadgets/equipment • Discuss the schedule of record keeping of temperature/humidity/day length of a tunnel • State health and safety measures **Practical Activity:** Conduct field visit, make a group of 5 trainees and design work plan to maintain healthy environment in a tunnel			
LU2. Maintain required humidity level in poly-house	**Trainee will be able to:** • Identify and arrange tools required to maintain humidity • Perform calibration of required equipment • Measure humidity level in	• Define humidity and describe its importance for tunnel farming • Explain the optimum levels of humidity at different growth stages of a tunnel crop	**Theory-** 05 Hrs **Practical-** 09 Hrs **Total-** 14 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Digital hygrometer • Humidifier	Field area

	required poly-house according to standard method • Maintain required humidity level using standard procedure • Ensure healthy environment for crop production • Maintain records • Ensure safety standards involved in process	• Enlist different gadgets/tools/equipment used to maintain and measure humidity in tunnel • Knowledge of operating principle of humidifier • Discuss the schedule of record keeping of humidity in a tunnel • State health and safety measures **Practical Activity:** Conduct field visits, make a group of 5 trainees and record humidity levels at different growth stages of a crop in tunnel			
LU3.	**Trainee will be able to:**	• Describe the optimum	**Theory-** 04 Hrs	• Stationery • PPEs Kit	Field area

Maintain required temperature in poly-house	• Identify and arrange tools and equipment required to maintain temperature • Perform calibration of required equipment • Measure temperature in required poly-house according to standard method • Maintain required temperature using standard procedure • Ensure healthy environment for crop production • Maintain records • Ensure safety standards involved in process	temperature range for a crop in a tunnel • Enlist different materials to maintain temperature in a tunnel • Discuss different temperature measuring gadgets installed in a tunnel • Describe the schedule of record keeping of temperature in a tunnel • State health and safety measures **Practical Activity:** Conduct periodic field visits and record temperature at different times and growth stages of a crop in tunnel	**Practical-** 08 Hrs **Total-** 12 Hrs	• First aid box • Tags • Polyethylene sheets • Digital hygrometer	

LU4. Maintain day length in poly-house	**Trainee will be able to:** • Measure day length in required poly-house according to standard method • Maintain required day-length using standard procedure • Maintain records • Ensure safety standards involved in process	• Define day length • Discuss the impact of day length on plant growth • Describe the optimum range of day length for a crop in tunnel • Describe different crops in a tunnel based on their requirement of day length (short day, long day and day neutral) • Discuss the schedule of record keeping of day length(solar radiation) in a tunnel • State health and safety measures **Practical Activity:** Conduct field visits, make a group of 5 trainees and record day length at	**Theory-** 04 Hrs **Practical-** 07 Hrs **Total-** 11 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Charts • Plastic sheets	Field area

		different growth stages of a crop in tunnel			

Module 62: Obey the Workplace Policies and Procedures

Objective: After the completion of this module, the trainee will be able to develop skills and competencies required to develop and implement a workplace policy & procedure and to modify the policy to suit changed circumstances. It applies to individuals with managerial responsibilities who undertake work-developing approaches to create, monitor, improve strategies and policies within workplace and engage with a range of relevant stakeholders and specialists.

Duration: 21 Hours **Theory: 6 Hours** **Practical: 15 Hours** **Credit Hours: 2.1**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Obey the workplace personal appearance and hygiene	**Trainee will be able to:** • Wear suitable clothes for the workplace and respect local and cultural contexts • Meet specific company dress code requirements	Knowledge based questions • Define personal hygiene **Practical Activity:** Demonstrate the use of PPE	**Theory-** 1Hrs **Practical-3** Hrs **Total-4** Hrs		

LU2. Follow work ethics	**Trainee will be able to:** • Follow company value/ ethics code/ conduct policies and guidelines • Use company resources in accordance with company ethical standards • Conduct personal behavior and relationships in accord with company policy & procedures • Demonstrate ethical behavior with co-workers • Report work incident situations or resolve accordingly	• Define work ethics **<u>Practical Activity:</u>** Demonstrate work ethics	**Theory-** 1Hrs **Practical-** 2Hrs **Total-** 3Hrs		
LU3. Demonstrate the Work place behaviors	**Trainee will be able to:** • Practice the positive behavior • Avoid arguing • Adopt flexibility in behavior to accept the resistance	• Define behavior **<u>Practical Activity:</u>** Demonstrate the Work place	**Theory-** 1Hrs **Practical-4** Hrs **Total-** 5Hrs		

		behaviors			
LU4. Communicate workplace policy& procedures	**Trainee will be able to:** • Listen directions carefully • Ask relevant questions politely • Avoid to use abusive language/ expression • Respect co-workers and others	• Explain communication skills **<u>Practical Activity:</u>** Communicate workplace policy& procedures	**Theory-** 1Hrs **Practical-** 4Hrs **Total-** 5Hrs		
LU5. Review the implementation of workplace policy & procedures	**Trainee will be able to:** • Ensure proper implementation of policies • Enlist the gaps for improvement • Follow the feedback, if any	• Define reviewing criteria **<u>Practical Activity:</u>** Review the implementation of workplace policy &	**Theory-** 2Hrs **Practical-** 2Hrs **Total-** 4Hrs		

		procedures			

Module 63: Perform Integrated Pest Management(IPM)

Objective: After the completion of this module, the trainee will be able to develop skills and competencies required to identify pest invasion, schedule the implementation of control stratigies by IPM, perform control measures and evaluation of control measures.

Duration: 60 Hours **Theory: 24 Hours** **Practical: 36 Hours** **Credit Hours: 6**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Identify pest invasion	**Trainee will be able to:** • Identify plant pest and disorders according to prescribed IPM • Identify the beneficial organisms according to insect orders.	• Define pest • Differentiate between insect and pest • Enlist different types of pest • Discuss different beneficial insects (Honey bee, Wasps, Syrphid fly, Trichogramma, Lady bird beetle, Dragonfly etc.) • Discuss ETL of insect pest invasion in a targeted area • State the health and safety	**Theory-** 04 Hrs **Practical-** 06 Hrs **Total-** 10 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Color charts	Class room/Workplace, Field area

	• Assess scope and size of the damage according to economic threshold level (ETL) • Follow health and safety standards required	measures **Practical Activity:** Conduct a field visit, make a group of 5 trainees and identify different harmful & beneficial insects and perform collection			
LU2. Schedule the implementation of control strategies by IPM	**Trainee will be able to:** • Select required control activities according to damage • Identify and arrange tools, equipment, machinery and biological cards for required activity • Ensure risks and hazards management according to safety standards • Ensure Personal Protective Equipment (PPEs) according to required operations • Ensure Eco-friendly	• Define IPM • Discuss control strategies according to recorded damage • Enlist different tools/equipment/implements used for IPM practices • Explain the risks and hazards management as per safety standards • Discuss the importance of eco-friendly control measures • State the personal health and safety standards	**Theory-** 06 Hrs **Practical-** 08 Hrs **Total-** 14 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Color charts	Class room/Workplace, Field area

	procedures according to standards.	**Practical Activity:** Make a group of 5 trainees and prepare a schedule of IPM strategies			
LU3. Perform pest control measures	**Trainee will be able to:** • Identify and arrange required tools and chemicals required to perform IPM activity • Implement IPM standards • Maintain work place after completion of each activity. • Prepare performance report according to format • Maintain record according to legislative guidelines.	• Describe different control methods in IPM (Cultural control, Physical control, Genetic engineering, biological control, chemical control, regulatory control) • Knowledge of biological control agents • Discuss the record keeping of IPM strategies • State the personal health and safety measures	**Theory-** 08 Hrs **Practical-** 15 Hrs **Total-** 23 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Color charts • Pesticides • Knapsack hand sprayer • Knapsack power sprayer • Jars • Plastic basket	Field area

		Practical Activity: Conduct field visit, make a group of 5 trainees and perform pest control measures			
LU4. Inspect Control measures	**Trainee will be able to:** • Check side effects of control measures on plants and external environment. • Measure efficiency of applied control activity with reference to standard protocols. • Regulate IPM control methods to meet organizational requisites.	• Discuss the eco-friendly insect pest control measure • Explain the impacts of different control measures on plant health and environment • Describe the efficacy of adopted control measure according to standard protocols • Discuss the regulatory control measures to restrict the entry/spread of pests in an area/country (inspection, quarantine, destruction of infested material etc.)	**Theory-** 06 Hrs **Practical-** 07 Hrs **Total-** 13 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Color charts	Field area

		Practical Activity: Make a group of 5 trainees and write a detailed report on the evaluation of possible IPM control measures.			

Module 64: Perform weeding

Objective: After the completion of this module, the trainee will be able to develop skills and competencies required to evaluate weed infestation, schedule weed control measures, weed control operation and inspection of weed control measures.

Duration: 40 Hours **Theory: 16 Hours** **Practical: 24 Hours** **Credit Hours: 4**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Evaluate weed infestation	**Trainee will be able to:** • Identify and arrange tools required for weeding • Identify and record weeds population and types in target area according to standards. • Evaluate the size, stage and span of weed infestation in targeted area on prescribed format. • Assess ETL (Economic Threshold Level) of weed in targeted area • Select control measures in accordance with health, safety	• Define weed • Enlist different tools/implements used for weeding • Explain different types of weeds on the basis of their morphology, season and life span • State favorable conditions for weed infestation • Explain different methods of weeds eradication	**Theory-** 02 Hrs **Practical-** 03 Hrs **Total-** 05 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Color charts	Class room/Workplace

	and environmental requisites. • Ensure personal health and safety standards	• Knowledge of ETL for weeds in a targeted area • State personal health and safety measures **Practical Activity:** Conduct an field visit, make a group of 5 trainees to identify different weeds and evaluate their infestation in a tunnel and prepare list based on their morphology, season and life span			
LU2. Prepare schedule for weed control measures	**Trainee will be able to:** • Ensure favorable environmental conditions according to required method • Prepare plan for required activity • Ensure availability of required	• Discuss work plan for weed control measures • Explain appropriate methods of weed eradication • Differentiate between physical, mechanical and chemical control method of	**Theory-** 03 Hrs **Practical-** 05 Hrs **Total-** 08 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Color charts	Class room/Workplace, Field area

	resources • Ensure eco-friendly procedures • Plan execution according to regulatory requirements. • Ensure personal health and safety standard	weeds • Discuss hazards associated with chemical control • Describe personal health and safety measures **Practical Activity:** Conduct a field visit, make a group of 5 trainees and prepare schedule for weed control measures			
LU3. Perform Manual Weeding	**Trainee will be able to:** • Identify and arrange implements for required process • Perform manual weeding process as per standard requirement • Ensure PPEs for required task	• Define manual weeding • Enlist different tools used for manual weeding • Explain the procedure of manual weeding • Discuss merits and demerits of manual weeding • Discuss the record keeping	**Theory-** 05 Hrs **Practical-** 07 Hrs **Total-** 12 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Color charts • Hoe • Khurpa • Shovel • Spade • weeder	Field area

	• Manage records of the control practices according to procedures and monitoring authorities	of manual weeding • State personal health and safety measures **Practical Activity:** Conduct a field visit, make a group of 5 trainees and perform manual weeding for a crop in a tunnel			
LU4. Apply weedicides	**Trainee will be able to:** • Identify and arrange implements for required process. • Apply weedicides as per required dosage. • Ensure use of PPEs according to standards. • Manage records of the control practices according to procedures and monitoring authorities concerned head/department	• Define weedicide • Enlist different chemicals used as weedicide • Differentiate between pre and post emergence weedicides • Estimate different doses of weedicide as per requirement of the crop and weed intensity • Explain the procedure of weedicide application	**Theory-** 06 Hrs **Practical-** 09 Hrs **Total-** 15 Hrs	• Stationery • PPEs Kit • First aid box • Tags • Color charts • Weedicide • herbicide • knapsack hand sprayer • knapsack power sprayer	Field area

		• Discuss the record keeping of weedicide application • State personal health and safety measures **Practical Activity:** Conduct a field visit, make a group of 5 trainees and perform weedicide application for a tunnel crop			

Module:65. Perform Integrated Disease Management (IDM)

Objective: After the completion of this module, the Trainee will be able to develop skill and competence required for inspection of plant diseases, plan the management of diseases, implementation of plant disease operations and monitor disease management.

Duration: 60 Hours **Theory: 24 Hours** **Practical: 36 Hours** **Credit Hours: 6**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Inspect plant diseases	**Trainee will be able to:** • Identify and arrange tools required for inspection process • Identify and record plant diseases and pathogens in target area according to standards • Assess the symptoms on targeted plant according to required disease • Assess the rate of infection of disease by specific pathogen according to ETL.	• Define Disease • Define sign and Symptoms • Enlist tools for identification and collection of diseased samples • Define disease incidence and disease severity index • Explain the disease rating scale • Discuss the calculation method for evaluating the disease index/severity in	**Theory-** 08 Hrs **Practical-** 12 Hrs **Total-** 20 Hrs	• Masks • Goggles • Tanks • Measuring Scale • Gloves • Shoes • Lens • Notebook • Petri plates	Class Room / Field Visit

		target area. **Practical Activity:** Conduct field visit, collect disease sample on the basis of symptoms		• Media • Microscopes	
LU2. Prepare plan for the management of diseases	**Trainee will be able to:** • Select appropriate control method according to field conditions and legislative measures • Prepare plan for selected activity according to environmental conditions. • Arrange tools according to required method • Ensure availability of personal protective equipment (PPE) according to health and safety procedures	• Define eradication, elimination and preventive measure • Discuss conventional principles for controlling plants diseases.(avoidance, exclusion, eradication, protection, resistance and therapy) • Discuss the legislative and regulatory measure to manage plant diseases • Enlist the tools required for disease management • Discuss integrated disease management strategies.	**Theory-** 04 Hrs **Practical-** 07 Hrs **Total-** 11 Hrs	• Masks • Goggles • Measuring Scale • Gloves • Shoes • Lens • Notebook • Microscopes	Class Room Training Workshop Lab/ Field Visit

		• Enlist the PPEs **Practical Activity:** Conduct a field visit to identify infected plants and work out disease control method according to infection rate			
LU3. Implement plant disease management operations	**Trainee will be able to:** • Ensure availability of required material for selected method. • Perform required control strategy according to standard procedure. • Manage records of the control practices according to procedures. • Ensure health and safety standards involved in selected activity.	• Discuss the agro-chemicals for disease management • Discuss the chemical application methods • Discuss the agro-chemical dose calculation • Explain the health and safety standards **Practical Activity:** Perform the agro-chemical application after dose	**Theory-** 12 Hrs **Practical-** 17 Hrs **Total-** 29 Hrs	• Sprayers • Masks • Goggles • Tanks • Measuring Scale • Gloves • Shoes • Lens • Notebook	Class Room Training Workshop Lab/ Field Visit

		calculation for specific/target area			

Tunnel Farming, Green House & Agribusiness

Module:66. Handle harvested produce

Objective: After the completion of this module, the trainee will be able to develop skill and competence required to prepare plan for transport of the harvested produce, perform transportation of farm produce, and ensure farm produce quality.

Duration: 40 Hours **Theory: 16 Hours** **Practical: 24 Hours** **Credit Hours: 4**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Prepare plan for transport of the harvested produce	**Trainee will be able to:** • Identify and arrange transportation tools and equipment. • Prepare transportation schedule as per produce requirement. • Ensure and manage risks and hazards according to standard protocols. • Observe site environmental conditions according to standards.	Knowledge based questions • Define maturity • Define physiological maturity • Enlist the harvest produce • Discuss the environmental conditions for produce transport. • Discuss the types of transportation as per produce requirement.	**Theory-** 03 Hrs **Practical-** 05 Hrs **Total-** 08 Hrs	• Notebook • Computers • Charts • Route map	Class Room Training Workshop Lab/ Field Visit

		Practical Activity: Prepare the layout for transportation of produce.			
LU2. Perform Transportation of Farm produce	**Trainee will be able to:** • Identify and arrange transport as per produce requirement • Load farm produce according to vehicle capacity. • Ensure security of farm produce during load. • Ensure transport rules and routes. • Unload farm produce on proper spot by following the standard protocols. • Maintain records according to departmental requirements. • Ensure required health and safety standards	• Explain pre and post handling of farm produce. • Discuss the loading and unloading procedures of farm produce. • State standards protocols for environment and road safety • Discuss the record keeping of farm produce • Knowledge of farm vehicle maintenance. • Demonstrate the PPEs **Practical Activity:** Perform loading and	**Theory-** 08 Hrs **Practical-** 12 Hrs **Total-** 20 Hrs	• Tractors, • Terrain vehicles (ATVs) and utility vehicles (UTV) • Farm Truck • Wagon • Trolleys • Notebook • Computers • Route map	Class Room Training Workshop Lab/ Field Visit

		unloading of different farm produce			
LU3. Ensure farm produce quality	**Trainee will be able to:** • Ensure standard hygiene conditions. • Follow enterprise protocols for storage of farm produce. • Perform quality checks before and after transportation of farm produce. • Maintain Records	• Define storage. • Explain the storage methods • State the storage standards • Discuss the maintenance of storage equipment. • Explain the quality checks methods. **<u>Practical Activity:</u>** Make the group of 5 students and perform the quality checks of farm produce.	**Theory-** 05 Hrs **Practical-** 07 Hrs **Total-** 12 Hrs	• Notebook • Computers • Charts • Storage equipment's • Thermometer • Humidifier • Air conditions	Class Room Training Workshop Lab/ Field Visit

Module:67. Perform packaging of produce

Objective: After the completion of this module, the trainee will be able to develop skill and competence required to select the packaging materials, its requirement and its labeling

Duration: 60 Hours **Theory: 24 Hours** **Practical: 36 Hours** **Credit Hours: 6**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Select packaging material	**Trainee will be able to:** • Identify the packaging material as per given produce • Identify capacity of the packaging material according to market requirement. • Ensure Brand Reputation compliance global standards (BRCGS standard)	Knowledge based questions • Define packaging • Describe the packaging material types • Discuss the packaging methods • State the packaging standards (BRCGS) • Explain the market survey for demands	**Theory-** 07 Hrs **Practical-** 11 Hrs **Total-** 18 Hrs	• Packaging bags • Packaging baskets • Needles • Sealing machine • Label material • Grader	Class Room Training Workshop Lab/ Field Visit

		Practical Activity: Make a group of five students to perform identification of different packaging materials as per produce requirement.			
LU2. Perform packaging	**Trainee will be able to:** • Identify and arrange the materials and tools required for packaging • Perform sorting according to prescribe standards • Perform the grading according to industry standards • Perform packaging of graded produce as per requirement • Ensure the correct seal as per requirement • Ensure personal hygiene and food safety in accordance with industry guidelines	• Define sorting and give its importance • Define grading and give its importance • State the sorting standards as per industry requirement • State the grading standards as per industry requirement • Discuss the criteria for packaging of farm produce • Explain the Personal hygiene and food safety protocol **Practical Activity:** Make a group of five	**Theory-** 12 Hrs **Practical-** 16 Hrs **Total-** 28 Hrs	• Packaging bags • Packaging baskets • Needles • Sealing machine • Label material • Grader • Notebook • Pen • Pencils	Class Room Training Workshop Lab/ Field Visit

		students to perform sorting and grading for packaging of produce.			
LU3. Label packaged items	**Trainee will be able to:** • Arrange labels and stickers according to content of packaging • Paste Labels and stickers accurately according to product standards • Maintain the record according to legislative guidelines	• Define labeling and give its importance • Explain the criteria for labeling of farm produce • Discuss the record keeping of label product **Practical Activity:** Perform labeling and maintain record of farm produce	**Theory-** 05 Hrs **Practical-** 09 Hrs **Total-** 14 Hrs	• Notebook • Pen • Pencils • Packaging bags • Calculator • Label material • Heat gun	Class Room Training Workshop Lab/ Field Visit

Tunnel Farming, Green House & Agribusiness

Module:68. Store Harvested produce

Objective: After the completion of this module, the Trainee will be able to store the harvested produce.

Duration: 60 Hours **Theory: 24 Hours** **Practical: 36 Hours** **Credit Hours: 6**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Prepare plan for requirements of storage system	**Trainee will be able to:** • Schedule the storage plan according to the storage commodity. • Design the layout of storage area. • Perform disinfection of storage area according to standard protocol.	Knowledge based questions • Define commodity • Define disinfection and its types that employ in store areas • Discuss lay out plan for storage area as per storage requirements **<u>Practical Activity:</u>** Make a group of five students and design layout	**Theory-** 04 Hrs **Practical-** 07 Hrs **Total-** 11 Hrs	• Refrigerators • Mask • Tanks • Gloves • Shoes • Cupboard • Bins • Containers • Cellar • Cold Store	Class Room Training Workshop Lab/ Field Visit

		for storage system		• Shelving racks	
LU2. Identify storage requirements of produce	**Trainee will be able to:** • Identify the storage requirements according to produce quantity • Ensure seasonal requirements for the harvested produce. • Ensure 24/7 electricity source for storage • Maintain Hygiene conditions according to defined standards • Maintain required temperature and humidity as per required standards	• Enlist tools and equipment for storage • Knowledge of seasonal storage requirements as per produce. • State ideal storage condition as per produce requirement. **<u>Practical Activity:</u>** Conduct visit of storage house and check the working efficiency of equipment.	**Theory-** 09 Hrs **Practical-** 14 Hrs **Total-** 23 Hrs	• Refrigerators • Mask • Tanks • Gloves • Shoes • Cupboard • Bins • Containers • Cellar • Cold Store • Shelving racks	Class Room Training Workshop Lab/ Field Visit

				•	
LU3. Ensure conditions for optimum storage of products	**Trainee will be able to:** • Ensure maintain the requirements of storage product. • Ensure post-harvest treatments for storage commodity according to standard • Perform the appropriate preservation techniques for storage product. • Ensure preparation requirements for storage of product • Maintain records according to departmental requirements.	• Discuss storage requirements of store commodities. • Differentiate pre and post - harvest practices. • Discus storage types and storage techniques • Knowledge of PPE's. **Practical Activity:** Conduct visits to evaluate optimum conditions for proper storage.	**Theory-** 11 Hrs **Practical-** 15 Hrs **Total-** 26 Hrs	• Refrigerators • Mask • Tanks • Gloves • Shoes • Cupboard • Storerooms • Bins • Containers • Cellar • Cold store • Shelving racks	Class Room Training Workshop Lab/ Field Visit

Module:69. Maintain Records of produce

Objective: After the completion of this module, the Trainee will be able to develop skill and competence required to maintain stock register, Maintain Assets and Maintain catalogue.

Duration: 30 Hours **Theory: 12 Hours** **Practical: 18 Hours** **Credit Hours: 3**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Maintain Inventory registers	**Trainee will be able to:** • Maintain stock register as per standard format. • Maintain cash book on prescribed format. • Maintain fixed assets register as per prescribed format • Maintain crop registers according to standard format	Knowledge based questions • Discuss the criteria for maintenance of stock register. • Explain standard format for record keeping. • State the criteria for cash book maintenance. • Enlist the fixed assets. • Describe the maintenance criteria for crop register. **Practical Activity:** Make a group of five students to prepare and	**Theory-** 05 Hrs **Practical-** 08 Hrs **Total-** 13 Hrs	• Note books • Catalogues • Pens • Pencils • Measuring scale • Boards • Bins and containers	Class Room Training Workshop Lab/ Field Visit

		manage inventory register		• First Aid Box	
LU2. Prepare daily performance reports	**Trainee will be able to:** • Maintain Repair and maintenance history sheets. • Maintain log books. • Maintain crop data sheets according to prescribed format. • Prepare and submit damage report according to company SOPs.	• Define catalogue and its types. • Discuss procedure to maintain catalogue records. • Explain numeric skills to work with digital data record keeping. **Practical Activity:** Make a group of 5 students, visit to prepare data sheet of daily farm activities.	**Theory-** 07 Hrs **Practical-** 10 Hrs **Total-** 17 Hrs	• Note books • Catalogues • Pens • Pencils • Measuring scale • Boards • Bins and containers • First Aid Box	Class Room Training Workshop Lab/ Field Visit

Module:70. Perform Value addition of produce

Objective: After the completion of this module, the trainee will be able to develop skill and competence required to determine value addition method and value addition with quality assurance

Duration: 80 Hours **Theory: 32 Hours** **Practical: 48 Hours** **Credit Hours: 8**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Identify Value addition methods	**Trainee will be able to:** • Determine the require product for value addition • Identify the value addition methods according to requirements. • Prepare cost estimation for required product.	Knowledge based questions • Define value addition of produce. • Discuss benefits of value addition. • Describe different methods for value addition of produce. • Knowledge of cost estimation for value addition.	**Theory-** 04 Hrs **Practical-** 06 Hrs **Total-** 10 Hrs	• Mini Solar Drier Blanching unit • -Tray Drier • -Vacuum Drier • -Needles • -Canning unit • -Cool Chamber	Class Room Training Workshop Lab/ Field Visit

		Practical Activity: Make the flow charts of value addition methods		• -Utensils	
LU2. Perform the sorting and grading for value addition	**Trainee will be able to:** • Identify and Arrange tools required for sorting and grading. • Perform sorting according to prescribe standards • Perform grading according to required industry standards • Ensure personal hygiene and food safety in accordance with industry guidelines	• Differentiate between sorting and grading • Enlist methods of sorting and grading for value addition. • State the standard procedures of sorting and grading used for value addition. • Knowledge of PPEs **Practical Activity:** Perform sorting and grading for value addition	**Theory-** 08 Hrs **Practical-** 12 Hrs **Total-** 20 Hrs	• Mini Solar Drier Blanching unit • -Tray Drier • -Vacuum Drier • -Needles • -Canning unit • -Cool Chamber • -Utensils	Class Room Training Workshop Lab/ Field Visit

LU3. Perform value addition	**Trainee will be able to:** • Identify the required equipment's, tools and materials as per selected value addition method. • Perform required value addition methods according to set standards • Ensure personal hygiene and food safety in accordance with industry guidelines • Maintain the record as per standard according to departmental requirements.	• Enlist the required tools and equipment for value addition • Knowledge of industrial food safety requirements. • Discuss record keeping for value addition. • State use of PPE's. **<u>Practical Activity:</u>** Perform value addition for vegetable produce.	**Theory-** 11 Hrs **Practical-** 16 Hrs **Total-** 27 Hrs	• Mini Solar Drier • Blanching unit • -Tray Drier • -Vacuum Drier • -Needles • -Canning unit • -Cool Chamber • -Utensils • Grading machine • Sorting machine	Class Room Training Workshop Lab/ Field Visit
LU4. Perform the Preservation	**Trainee will be able to:** • Identify and arrange tools and material required for preservation	• Define preservation. • Explain the types and methods of preservation. • Enlist the tools and	**Theory-** 06 Hrs **Practical-** 09 Hrs	• Preservative materials • Tray Drier	Class Room Training Workshop Lab/ Field

	• Prepare preservatives according to standard protocol • Perform preservation method according to standard protocol. • Ensure the personal safety and work place hygiene according to HACCP standards. • Ensure food safety in accordance with industry guidelines	materials required for preservation. • Describe the procedure involved in preparation of preservatory materials • State standards for preservation. **Practical Activity:** Make a group of five students and perform the preservation of produce	**Total-** 15 Hrs	• -Vacuum Drier • -Needles • -Canning unit • -Cool Chamber • -Utensils • Preservative media	Visit
LU5. Maintain record	**Trainee will be able to:** • Identify and arrange the tools for labelling as per requirement. • Perform labelling according to standard protocols. • Maintain records on required format.	• Discuss the importance of record keeping • State standard procedures of record keeping • Enlist the labeling tools **Practical Activity:** Perform produce labeling and maintain records	**Theory-** 03 Hrs **Practical-** 05 Hrs **Total-** 08 Hrs	• Note books • Catalogues • Pens • Pencils • Measuring scale	Class Room Training Workshop Lab/ Field Visit

				• Boards • Bins and containers • First Aid	

Module:71. Market products and services

Objective: After the completion of this module, the Trainee will be able to develop skills and competencies required for marketing products and services.

Duration: 60 Hours **Theory: 24 Hours** **Practical: 36 Hours** **Credit Hours: 6**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Analyze market information	**Trainee will be able to:** • Identify, research and analyze existing or new markets for existing or new products or services using techniques to ensure reliable data • Analyze past trends and developments to determine market variability and associated risks • Develop gross margin budgets to account for market variability • Identify and evaluate competing products to determine strengths and weaknesses of own products • Monitor market environment to	Knowledge based questions • Discuss 7P's of marketing. • Describe importance of market with reference to produce. • Discuss effective strategies for marketing of produce. • Knowledge of marketing trends **<u>Practical Activity:</u>** Conduct a market survey and take steps to develop a new market of produce	**Theory-** 04 Hrs **Practical-** 06 Hrs **Total-** 10 Hrs	• Safety goggles • Safety harness belt • Safety helmet • Safety mask • Safety Shoes	Class Room Training Workshop Lab/ Field Visit

	ensure information is current and reliable • Identify the legal, ethical and environmental constraints of the markets and their effect on the enterprise • Identify product specifications that suit market requirements and price advantage at the time • Present clear and concise information to the enterprise management team.				
LU2. Identify and evaluate factors to include in a marketing plan	**Trainee will be able to:** • Identify and evaluate production processes to ensure required product specifications are met • Identify and assess alternative selling strategies and techniques to identify marketing targets and methods • Identify and assess distribution channels and their role in your marketing strategies • Ensure the data used is reliable	Knowledge based questions • Define Agribusiness • Describe various factors influencing marketing • Explain advanced methods of sales and marketing • Discuss role of distributors and middle men in effective sales	**Theory-** 04 Hrs **Practical-** 06 Hrs **Total-** 10 Hrs	• Boards • Laptop • Ledgers • Cash books • Receipt books • Pencils • Charts • PPEs	Class Room Training Workshop Lab/ Field Visit

	and the market environment and trends are substantiated • Evaluate the role of marketing professionals in providing advice	**Practical Activity:** Conduct a market visit and write a report on marketing strategies of produce			
LU3. Develop a marketing plan for your products and services	**Trainee will be able to:** • Establish marketing objectives based on current and potential product specifications • Select appropriate production processes to ensure product specifications are met • Select selling strategies to ensure required prices are achieved • Select appropriate distribution channel options to ensure access to target markets is achieved efficiently and	Knowledge based questions • Discuss the role of potential products specifications in marketing of produce • Discuss the role of target market in effective sales • State the importance of effective distribution network • Discuss the product cost in terms of sales	**Theory-** 03 Hrs **Practical-** 05 Hrs **Total-** 08 Hrs	• Boards • Laptop • Ledgers • Cash books • Receipt books • Pencils • Charts • PPEs	Class Room Training Workshop Lab/ Field Visit

	appropriately • Establish timeframes for production, distribution and selling activities • Develop a gross margin budget to demonstrate the cost	and marketing **Practical Activity:** Develop a marketing plan for effective sales and marketing of produce			
LU4. Determine promotional strategies	**Trainee will be able to:** • Prepare and record detailed plans for promotional activities • Outline objectives, level of exposure and available markets • Ensure strategies take account of time management and scheduling issues, and resource constraints • Create promotional materials that enhance the product and commercial presentation • Record and communicate	Knowledge based questions • Discuss the role of promotional activities for effective sales • Elaborate the role of time and customer selection in sales and marketing • Enlist channels for sales and marketing in Agribusiness	**Theory-** 04 Hrs **Practical-** 06 Hrs **Total-** 10 Hrs	• Boards • Laptop • Ledgers • Cash books • Receipt books • Pencils • Charts • PPEs	Class Room Training Workshop Lab/ Field Visit

	priorities, responsibilities, timelines and budgets for promotional activities.	**Practical Activity:** Promote the given product on social media			
LU5. Implement marketing activities	**Trainee will be able to:** • Schedule planned marketing activities within appropriate timeframes • Develop measurable performance targets that meet business plan objectives • Organize distribution channels and ensure product and service information is accurate and readily available to • Implement marketing activities within budgetary constraints to meet legal, ethical and enterprise requirements	Knowledge based questions • Define marketing ethics in Agribusiness • Discuss the objectives of target based sales • Explain role of various marketing activities in effective sales • Knowledge of marketing budget **Practical Activity:**	**Theory-** 05 Hrs **Practical-** 07 Hrs **Total-** 12 Hrs	• Boards • Laptop • Ledgers • Cash books • Receipt books • Pencils • Charts • PPEs	Class Room Training Workshop Lab/ Field Visit

		Make a group of five students and perform a marketing activity to boost sales.			
LU6. Evaluate marketing performance.	**Trainee will be able to:** • Review the established marketing objectives to ensure they remain viable • Make an objective assessment of the marketing plan and its implementation by a comparison of valid and reliable data against the established objectives • Assess product, pricing and distribution policies in relation to market changes, marketing objectives and enterprise requirements • Identify areas of positive marketing performance and take corrective action to remedy poor marketing performance areas	Knowledge based questions • Discuss the role of customer satisfaction in effective sales • Discuss competitive price of similar products in market • Knowledge of cost benefit ratio of produce in agribusiness • Discuss the marketing performance of different areas and make	**Theory-** 04 Hrs **Practical-** 06 Hrs **Total-** 10 Hrs	• Boards • Laptop • Ledgers • Cash books • Receipt books • Pencils • Charts • PPEs	Class Room Training Workshop Lab/ Field Visit

	• Document and distribute information for continual analysis and effective planning management	strategies to improve sales in low performance areas. **<u>Practical Activity:</u>** Conduct a market visit and make a report on effective consumption of product and customer reviews.			

Module:72. Sale harvested produce

Objective: After the completion of this module, the Trainee will be able to develop skill and competence required to select the suitable market for sale of harvested produce

Duration: 40 Hours **Theory: 16 Hours** **Practical: 24 Hours** **Credit Hours: 4**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Prepare for Sale of produce	**Trainee will be able to:** • Identify and arrange required material for sale • Prepare work plan for selling of required produce • Perform checks for required tools and machinery • Ensure health and safety guidelines for required task.	Knowledge based questions • Define Sale • Describe the process of sale • Enlist material required for sale • Discuss market and marketing strategies **<u>Practical Activity:</u>**	**Theory-** 03 Hrs **Practical-** 05 Hrs **Total-** 08 Hrs	• Boards • Laptop • Ledgers • Cash books • Receipt books • Pencils • Charts • PPEs	Class Room Training Workshop Lab/ Field Visit

		Prepare flyers and brochures for sale activity.			
LU2. Manage sale	**Trainee will be able to:** • Arrange required material • Load commodities according to required order • Ensure loading standards • Transport produce to required place following company's SOPs • Deliver produce according to decided orders	Knowledge based questions • Define different types of sale • Discuss sequence/order of loading commodities according to their nature • Describe methods of transportation of produce **<u>Practical Activity:</u>** Perform a strategic sale to generate revenue of your produce	**Theory-** 07 Hrs **Practical-** 10 Hrs **Total-** 17 Hrs	• Boards • Laptop • Ledgers • Cash books • Reciept books • Pencils • Charts • PPEs	Class Room Training Workshop Lab/ Field Visit

LU3. Manage Finance	**Trainee will be able to:** • Maintain sales record on required format • Prepare triplicates for each delivery • Collect cash according to set SOPs • Maintain Cash Book according to required format • Maintain ledgers according to prescribed formats	Knowledge based questions • Define finance in terms of sales • Elaborate factors affecting finance • State purpose of triplicates of invoice • State the record keeping of finance **Practical Activity:** Conduct a visit of market, collect sales data and maintain cashbook according to sales.	**Theory-** 06 Hrs **Practical-** 09 Hrs **Total-** 15 Hrs	• Boards • Laptop • Ledgers • Cash books • Reciept books • Pencils • Charts • PPEs	Class Room Training Workshop Lab/ Field Visit

11. List of Tool & Equipment:

As mentioned in **'Materials required'** column

12. Members of the Curriculum Development Committee

S#	Name	Designation
1	Dr. Adnan Zahid	Associate Prof (IAGS,PU, Lahore)
2	Dr. Sumaira Maqsood	Associate Prof (IAGS,PU, Lahore)
3	Ms. Noor ul Ain	M.Phil. Scholar, (IAGS,PU, Lahore)
4	Ms. Hina Ashraf	PhD Scholar (PU, Lahore)
5	Mr. Muhammad Faheem	RA, Arid University Rawalpindi
6	Mr. Muhammad Asif	Master Trainer, off Seasonal Vegetables Lahore

7	Syeda Tehmeen Fatima	M.Phil. Scholar, (IAGS,PU, Lahore)
8	Abdul Manan Saleem	PhD Scholar
9	Ms. Sana GulDad	Agriculture Department KPK
10	Mr. Farhan Mehmood	Parks and Horticulture Authority, Rawalpindi
11	Ms. Iqra Haider Khan	IAGS,PU, Lahore
12	Ms, Hadia Maqsood	IAGS,PU, Lahore
13	Muhammad Abdul Basit	R&D Manager, Lahore
14	Engr. Aijaz Ahmed Zia	DACUM Facilitator

15	Mr. Muhammad Ishaq	Deputy Director/ Coordinator – (Skills Standards and Curricula) NAVTTC HQ