

Course Curricula for

**Short Term Courses based on  
Modular Employable Skills (MES)**

In

**Agriculture Sector**



**DIRECTORATE GENERAL OF EMPLOYMENT AND TRAINING**

**MINISTRY OF LABOUR AND EMPLOYMENT**

**GOVERNMENT OF INDIA**

**Course Curricula for Short Term Courses based on Modular  
Employable Skills (MES) in the Agriculture Sector**

**CONTENTS**

1. Background .....	4
2. Frame Work for Skill Development based on Modular Employable Skills .....	4
3. Age of Participants .....	5
4. Curriculum Development Process .....	5
5. Development of Core Competencies .....	5
6. Duration of the Programmes .....	6
7. Pathways to acquire Qualification .....	6
8. Methodology .....	7
9. Instructional Media Packages .....	7
10. Assessment .....	7
11. Certificate .....	7
12. Course Matrix .....	8
13. Module-Repair & Maint. Of Tyre & Tube .....	9
14. Repair, Maint. & Operation of tillage equipment .....	11
15. Repair, Maint. & Field Operation of Soil farming equipment .....	13
16. Repair, Maint. & Field Operation of Seed drills .....	15
17. Repair, Maint. & Field Operation of Planters & trans planters .....	17
18. Repair, Maint. & Field Operation of Root harvesting equipment .....	19
19. Basic Tractor Servicing .....	21
20. Repair & Maint. Of Irrigation equipment .....	23
21. Repair & Maint. Of Spraying & Dusting equipment .....	25
22. Repair & Maint. Of harvesting & Threshing equipment .....	27
23. Basic Cultivation of Cereal crops .....	29
24. Repair & Maint. Of Radiator...	31
25. Repair, Maint. & Operation of Energy sources equipment .....	33
26. Repair & Overhauling of Tractor .....	35
27. Repair, Maint. & Operation of Power Tiller .....	38
28. Repair & Overhauling of Hydraulic system .....	40
29. Cultivation of Oil Seeds & pulses .....	42
30. Cultivation of Vegetables .....	44
31. Cultivation of Orchards with special reference to citers .....	46
32. Cultivation of Potato ....	48
33. Cultivation of Cotton ..	50

34. Cultivation of Groundnut & Sunflower. ....	52
35. Cultivation of Fodder .....	54
36. Repair,Maint. & Field Operation of combine harvester ....	56
37. Repair,Maint.& Operation of post harvesting equipment. ....	58
38. Repair,Maint.& Operation of processing equipment. ....	60
39. Repair,Maint. & Field Operation of landshaping &develop.machinery ...	62
40. Custom hiring of agriculture machinery .....	64
41. List of Expert/Trade Committee Members .....	67

## Skill Development based on Modular Employable Skills (MES)

### Background

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The need for giving emphasis on the Skill Development, especially for the less educated, poor and out of school youth has been highlighted in various forums. The skill level and educational attainment of the work force determines the productivity, income levels as well as the adaptability of the working class in changing environment. Large percentage of population in India is living below poverty line. One of the important causes is lower percentage of skilled persons in the workforce

The skill development at present is taking place mostly in the informal way, i.e. persons acquire skill at the work-place when they help their parents, relatives and employers etc. Such persons do not have a formal certificate and thus earn lower wages and are exploited by employers. They have come through informal system due to socio-economic circumstances of the family and the compulsions of earning a livelihood rather than attending a formal course. While their productivity is low, their contribution to the national GDP cannot be ignored. If the country can create a system of certification which not only recognizes their skills but also provides education and training in a mode that suits their economic compulsions, it will not only benefit the workforce to earn a decent living but also contribute to the national economy by better productivity of this workforce.

Another related problem to be tackled is large number of students drop outs (About 63% of the school students drop out at different stages before reaching Class-X).

### Frame work for Skill Development based on ‘Modular Employable Skills (MES)’

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Very few opportunities for skill development are available for the above referred groups (out of school youth & existing workers especially in the informal sector). Most of the existing Skill Development programmes are long term in nature. Poor and less educated persons can not afford long term training programmes due to higher entry qualifications, opportunity cost etc. Therefore, a new frame work for Skill Development for the Informal Sector has been evolved by the DGET to address to the above mentioned problems. The **key features of the new frame work for skill development** are:

- ◆ Demand driven Short term training courses based on modular employable skills decided in consultation with Industry
- ◆ Flexible delivery mechanism (part time, weekends, full time)
- ◆ Different levels of programmes (Foundation level as well as skill upgradation) to meet demands of various target groups
- ◆ Central Government will facilitate and promote training while Vocational Training (VT) Providers under the Govt. and Private Sector will provide training

- ◆ Optimum utilisation of existing infrastructure to make training cost effective.
- ◆ Testing of skills of trainees by independent assessing bodies who would not be involved in conduct of the training programme, to ensure that it is done impartially.
- ◆ Testing & certification of prior learning (skills of persons acquired informally)

The Short Term courses would be based on 'Modular Employable Skills (MES)'.

The **concept for the MES** is :

- Identification of 'minimum skills set' which is sufficient to get an employment in the labour market.
- It allows skills upgradation, multiskilling, multi entry and exit, vertical mobility and life long learning opportunities in a flexible manner.
- It also allows recognition of prior learning (certification of skills acquired informally) effectively.
- The modules in a sector when grouped together could lead to a qualification equivalent to National Trade Certificate or higher.
- Courses could be available from level 1 to level 3 in different vocations depending upon the need of the employer organisations.
- MES would benefit different target groups like :
  - Workers seeking certification of their skills acquired informally
  - workers seeking skill upgradation
  - early school drop-outs and unemployed
  - previously child labour and their family

#### Age of participants

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The minimum age limit for persons to take part in the scheme is 14 years but there is no upper age limit.

#### Curriculum Development Process

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Following procedure is used for developing course curricula

- Identification of Employable Skills set in a sector based on division of work in the labour market.
- Development of training modules corresponding to skills set identified so as to provide training for specific & fit for purpose
- Organization of modules in to a Course Matrix indicating vertical and horizontal mobility. The course matrix depicts pictorially relation among various modules, pre requisites for higher level modules and how one can progress from one level to another.
- Development of detailed curriculum and vetting by a trade committee and by the NCVT

(Close involvement of Employers Organizations, State Governments, experts, vocational training providers and other stake holders is ensured at each stages).

#### Development of Core Competencies

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Possession of proper attitudes is one of the most important attribute of a competent person. Without proper attitudes, the performance of a person gets adversely affected.

Hence, systematic efforts will be made to develop attitudes during the training programme.

The trainees deal with men, materials and machines. They handle sophisticated tools and instruments. Positive attitudes have to be developed in the trainees by properly guiding them and setting up examples of good attitudes by demonstrated behaviors and by the environment provided during training.

Some important core competencies to be developed are:

1. Safety consciousness and safe working practices
2. Care of equipment and tools
3. Punctuality, discipline and honesty
4. Concern for quality
5. Respect for rules and regulations
6. Concern for health and hygiene
7. Cordial relationship and Cooperation with co-workers and team Work
8. Positive attitude and behavior
9. Responsibility and accountability
10. Learn continuously
11. Communication Skills
12. Concern for environment and waste disposal

Following competencies should also be developed during level-II and higher courses:

1. Ability for planning, organizing and coordinating
2. Creative thinking, problem solving and decision making
3. Leadership
4. Ability to bear stress
5. Negotiation

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#### Duration of the Programmes

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Time taken to gain the qualification will vary according to the pathway taken and will be kept very flexible for persons with different backgrounds and experience. Duration has been prescribed in hours in the curriculum of individual module, which are based on the content and requirements of a MES Module. However, some persons may take more time than the prescribed time. They should be provided reasonable time to complete the course.

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#### Pathways to acquire Qualification:

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**Access to** the qualification could be through:

- An approved training programme; **Or**
- A combination of an approved training programme plus recognition of prior learning including credit transfer; **Or**

- The recognition of prior learning that provides evidence of the achievement of the competencies for the qualification.

#### Methodology

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The training methods to be used should be appropriate to the development of competencies. The focus of the programme is on “performing” and not on “Knowing”. Lecturing will be restricted to the minimum necessary and emphasis to be given for ‘hands on training’.

The training methods will be individual centered to make each person a competent one. Opportunities for individual work will be provided. The learning process will be continuously monitored and feedback will be provided on individual basis.

Demonstrations using different models, audio visual aids and equipment will be used intensively.

#### Instructional Media Packages

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In order to maintain quality of training uniformly all over the country, instructional media packages (IMPs) will be developed by the National Instructional Media Institute (NIMI), Chennai.

#### Assessment

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DGE&T will appoint assessing bodies to assess the competencies of the trained persons. The assessing body will be an independent agency, which will not be involved in conducting the training programmes. This, in turn, will ensure quality of training and credibility of the scheme. Keeping in view the target of providing training/testing of one million persons through out the country and to avoid monopoly, more than one assessing bodies will be appointed for a sector or an area.

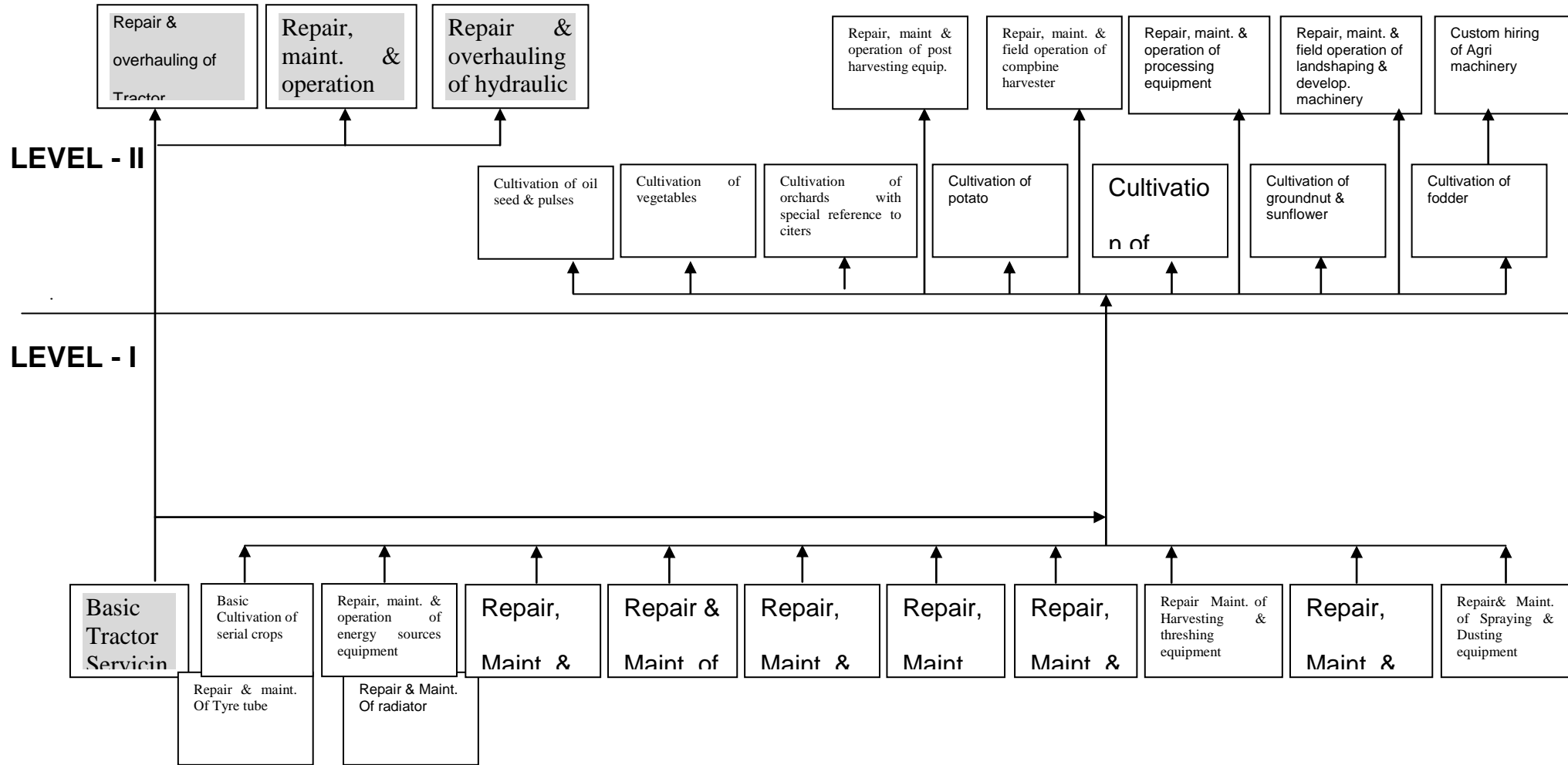
#### Certificate

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Successful persons will be awarded certificates issued by National Council for Vocational Training (NCVT).

## COURSE MATRIX IN AGRICULTURE SECTOR

### Course Outline / Pathway

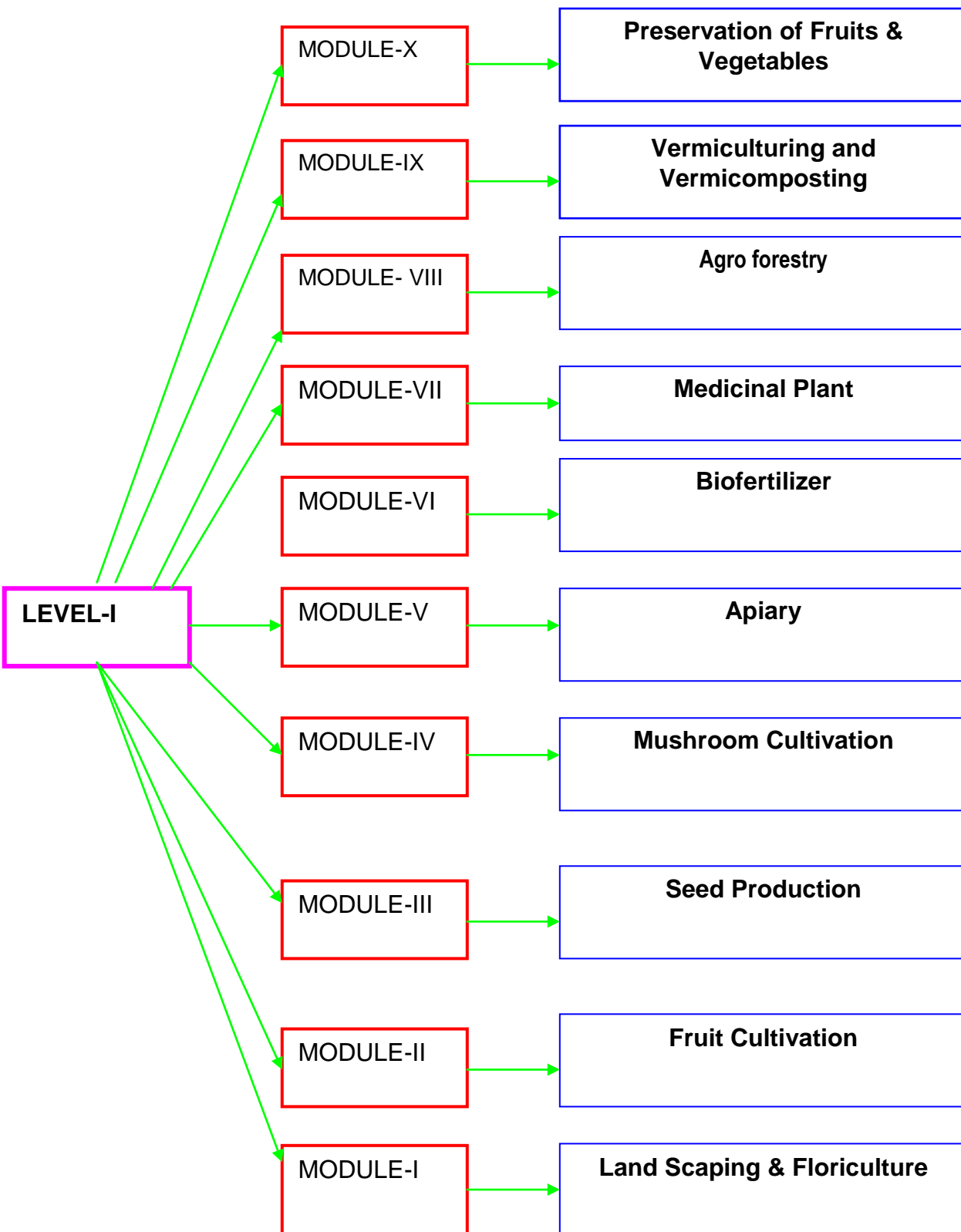




**Course Matrix**

**Agriculture & Allied Sector**

**LEVEL-I**



**LEVEL- II**

**LEVEL-III**  
→

**MODULE-I**  
→

**Entrepreneurship Development  
in Agri Business(EDAB)**

**LEVEL-II**  
→

**MODULE-I**  
→

**Gardeners**

## Level – I

- 1. Module name** : **Repair, maintenance & field operation of Tillage Equipments.**
- 2. Sector** : **AGRICULTURAL SECTOR**
- 3. Code** : **AGR104**
- 4. Entry Qualification** : **Minimum 5<sup>th</sup> standard passed and 14 years of age**
- 5. Terminal competency** : **Successful candidate would be able to carry out repair, maintenance & field operation of Tillage Equipments.**
- 6. Duration** : **150 hours**

### 7. COURSE CONTENT :

<b>Practical Competencies</b>	<b>Underpinning Knowledge(Theory)</b>
<ul style="list-style-type: none"> <li>➤ Practice health &amp; safety selection, use, maintenance and storages of tools, equipments and clothing safety.</li> <li>➤ Identify different components of different tillage equipments such as M.B.-Plough disc plough sub soiler, chisel plough , rotavator , disc harrow cultivators peddlers and pulverising Roller .</li> <li>➤ Dismantle and assemble the ploughs harrow ,cultivators and rotavators.</li> <li>➤ Maintained &amp; minor repair the ploughs harrow ,cultivators &amp; rotavators.</li> <li>➤ Workshop and field adjustments of ploughs harrow ,cultivators &amp; rotavators..</li> <li>➤ Methods of field operation of ploughs harrow ,cultivators and rotavators their field adjustments.</li> <li>➤ Care and maintenance of ploughs harrow , cultivators &amp; rotavators..</li> </ul>	<ul style="list-style-type: none"> <li>➤ Knowledge on health &amp; safety precautions observed in workshop &amp; field.</li> <li>➤ Identify different components of different equipments such as M.B.- Plough disc plough sub soiler, chisel plough , rotavator, disc harrow and cultivators.</li> <li>➤ Working Principal and types of M.B.- Plough disc plough sub soiler, chisel plough , rotavator , disc harrow and cultivators.</li> <li>➤ Constructional details of ploughs harrow , cultivators &amp; rotavators.</li> <li>➤ Methods of field operation of ploughs harrow , cultivators &amp; rotavators and their field adjustments.</li> <li>➤ Adjustments of ploughs harrow and cultivators.</li> <li>➤ Recommended speed for ploughs harrow ,cultivators &amp; rotavators .</li> <li>➤ Care and maintenance of ploughs harrow , cultivators &amp; rotavators.</li> <li>➤ Safe handling &amp; storage of Tillage Equipments in off season</li> </ul>

## TOOLS & EQUIPMENT

S.No.	Item
1.	Steel Rule 30 cm, English and metric
2.	Screw driver 20 cm.x 9mm blade
3.	Screw driver 30 cm x 9mm blade
4.	Pliers combination 20 cm
5.	Vice grip pliers.
6.	Circlip pliers Expanding and contracting type 15 cm and 20 cm each 8 sets.
7.	Hand file 20 cm. Second cut half round
8.	Hand file 20 cm. Smooth triangular
9.	Hand file 30 cm bastard flat
10.	Hand file 30 cm bastard round
11.	Steel tool box with lock & key(folding type) size 400x200x150mm
12.	Allen Key set of 12 pieces (2mm to 14 mm)
13.	Engineer's square 15 cm blade
14.	Divider spring joint 15 cm.
15.	Scriber 15 cm with scribing block universal
16.	Pick punch 15 cm 2nos.
17.	Drift punch copper 15 cm
18.	Centre punch 10 mm dia x 100 mm
19.	Chisel cold flat 20 mm
20.	Chisels Cross cut 200mm x 6 mm
21.	Hacksaw frame adjustable for 30 cm blade
22.	Hand vice 37 mm
23.	Drill Twist (assorted)
24.	Drill electric hand 6-12 mm
25.	Electric pedestal grinder with two wheel
26.	Electric arc welding set portable
27.	Taps and Dies complete set in a box (metric) with handle.
28.	Hand reamer adjustable 10.5 to 11.25 mm, 11.25 to 12.75mm, 12.75 to 14.25mm and 14.25 to 15.75mm.
29.	Copper Hammer
30.	Ball peen Hammer 0.5 Kg.
31.	Cross peen Hammer 1 kg
32.	Sledge Hammer
33.	Spanner D E set of 12 pieces (6mm to 32 mm)
34.	Ring spanner set of 12 pieces (6mm to 32 mm.)
35.	Spanner, adjustable 20 cm.
36.	Spanner adjustable (pipe wrench) 350 mm
37.	Spanners socket of 8 with handles, T bar and ratchet
38.	Chain and Pulley block 3000 Kg capacity
39.	Horses and wheel choke
40.	Screw jack 4 ton capacity double lift
41.	Oil can 0.5-liter cap
42.	Grease Gun Hand/Pneumatic
43.	Cleaning trays 45 x 30 cm.
44.	Stud remover.
45.	'V' Block 75 x 38 mm pair with Clamps.
46.	Surface plate 60x60 cm
47.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
48.	Pullers screw powered 2mm with bearing puller attachment.
49.	Bearing puller screw powered/hydraulic powered with attachments
50.	Angle measuring instrument
51.	MB Plough – Augur type
52.	Disc Plough
53.	Reversible disc plough
54.	Sub soiler
55.	Chisel plough
56.	Rotavator
57.	Disc Harrow
58.	Spike tooth harrow – Power harrow
59.	Spring tooth harrow
60.	Cultivator (shovel type and sweep type)
61.	Puddler
62.	Pulverising

## LEVEL – I

- 1. Module name** : **Basic Tractor servicing.**
- 2. Sector** : **AGRICULTURAL SECTOR**
- 3. Code** ; **AGR101**
- 4. Entry Qualification** : Minimum 5<sup>th</sup> standard passed and 14 years of age
- 5. Terminal competency** : Successful candidate would be able to carry out minor repairs & routine services of Tractor .
- 6. Duration** : 150 hours

### 7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> <li>➤ Practice health &amp; safety select, use, maintain and store tools, equipments and clothing safety.</li> <li>➤ Practice 5 S techniques.</li> <li>➤ Identify / familiarize with tools and equipments.</li> <li>➤ Wash before and after repair.</li> <li>➤ Check replenish/top up lubricating oil, brake fluid, engine coolant, battery electrolyte transmission/hydraulic oil.</li> <li>➤ Clean/replace air cleaner filter, oil filter and fuel filters.</li> <li>➤ Apply grease to parts throw nipple .</li> <li>➤ Checks electrical system in petrol engine clean check &amp; adjust spark plug.</li> <li>➤ Check &amp; adjust fuel injection timing.</li> <li>➤ Bleeding of fuel (diesel) supply system.</li> <li>➤ Adjust clutch &amp; brake paddle play.</li> <li>➤ Charging of battery.</li> <li>➤ Check tyre pressure and inflate.</li> <li>➤ Rotate tyres.</li> </ul>	<ul style="list-style-type: none"> <li>➤ General health &amp; safety precautions to be observed in workshop/field.</li> <li>➤ Overview of 5S techniques (short set in order, shine, standardize is sustain).</li> <li>➤ Advantages in implementation of 5S.</li> <li>➤ Nomenclature of different parts of tractor.</li> <li>➤ Working of two/four stroke petrol/diesel engine.</li> <li>➤ Difference between two stroke &amp; four stroke petrol and diesel engine.</li> <li>➤ Types of lubrication system.</li> <li>➤ Types cooling system.</li> <li>➤ Fuel supply layout of petrol/diesel engine.</li> <li>➤ Layout of greasing points.</li> <li>➤ Brief introduction to ignition in petrol engine, ignition system circuit .</li> <li>➤ Introduction to fuel supply system in diesel engine.</li> <li>➤ Layout of components of fuel supply system in diesel engine.</li> <li>➤ Introduction to clutch, Gear box, differential, power converter and power take off.</li> <li>➤ Types of brakes and steering systems.</li> <li>➤ Maintenance of lead acid battery.</li> <li>➤ Tyre size and tyre rotation.</li> <li>➤ Reasons for general tyre defects.</li> <li>➤ Care and maintenance.</li> </ul>

## TOOLS & EQUIPMENTS

S.No.	Item
1.	Tractor
2.	Steel Rule 30 cm, English and metric
3.	Screw driver 20 cm.x 9mm blade
4.	Screw driver 30 cm x 9mm blade
5.	Pliers combination 20 cm
6.	Pliers round 15 cm
7.	Pliers flat nose 15 cm
8.	Pliers side cutting 15 cm
9.	Vice grip pliers.
10.	Circlip pliers Expanding and contracting type 15 cm and 20 cm each 8 sets.
11.	Hand file 20 cm. Second cut half round
12.	Hand file 20 cm. Smooth triangular
13.	Hand file 30 cm bastard flat
14.	Hand file 30 cm bastard round
15.	Feeler gauge 20 blades (metric)
16.	Steel tool box with lock & key(folding type) size 400x200x150mm
17.	Allen Key set of 12 pieces (2mm to 14 mm)
18.	Phillips Screw Driver Type set of 5 pieces 100 mm to 300 mm 04 Sets 34 Spanner, ring offset set
19.	Engineer's square 15 cm blade
20.	Divider spring joint 15 cm.
21.	Scriber 15 cm with scribing block universal
22.	Pick punch 15 cm 2nos.
23.	Drift punch copper 15 cm
24.	Centre punch 10 mm dia x 100 mm
25.	Chisel cold flat 20 mm
26.	Chisels Cross cut 200mm x 6 mm
27.	Hacksaw frame adjustable for 30 cm blade
28.	Engineer's Stethoscope 04 Screw driver 30 cm x 9 mm blade
29.	Hand vice 37 mm
30.	Drill Twist (assorted)
31.	Drill electric hand 6-12 mm
32.	Washing unit
33.	Air Compressor
34.	Electric pedestal grinder with two wheel
35.	Electric arc welding set portable
36.	Taps and Dies complete set in a box (metric) with handle.
37.	Hand reamer adjustable 10.5 to 11.25 mm, 11.25 to 12.75mm, 12.75 to 14.25mm and 14.25 to 15.75mm.
38.	Tachometer – to read up to 5000 rpm
39.	Mallets (Wooden/plastic)
40.	Ball peen Hammer 0.5 Kg.
41.	Cross peen Hammer 1 kg
42.	Spanner D E set of 12 pieces (6mm to 32 mm)
43.	Ring spanner set of 12 pieces (6mm to 32 mm.)
44.	Spanner, adjustable 20 cm.
45.	Spanner adjustable (pipe wrench) 350 mm
46.	Spanners socket of 8 with handles, T bar and ratchet
47.	Chain and Pulley block 3000 Kg capacity
48.	Horses and wheel choke
49.	Screw jack 4 ton capacity double lift
50.	Hydraulic jack 3 ton capacity with trolley
51.	Oil can 0.5-liter cap
52.	Grease Gun Hand/Pneumatic
53.	Cleaning trays 45 x 30 cm.
54.	Torque wrench set of 3 Nos.
55.	Stud remover.
56.	'V' Block 75 x 38 mm pair with Clamps.
57.	Surface plate 60x60 cm
58.	Compression testing gauge to read 0 to 760 mm of Hg.
59.	Triple leg grip puller with bearings attachment screw/hydraulic powered max. Spread 80,160,50,450 mm.
60.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
61.	Pullers screw powered 2mm with bearing puller attachment.
62.	Bearing puller screw powered/hydraulic powered with attachments
63.	Hydrometer.
64.	Valve spring lifter.
65.	Valve key inserter 1 no.
66.	Valve grinding tool set
67.	Fuel injection pump test bench with accessories
68.	Injector cleaning kit
69.	Injector dismantling & assembling jig & fixture
70.	Injector dismantling tool kit
71.	Injector testing set (hand operated)
72.	Engine management system's Sensors & Actuators – 4 sets.
73.	Wheel alignment gauge (computerized)
74.	Camber angle gauge
75.	Toe-in, toe-out gauge
76.	Tyre pressure gauge
77.	Wheel balancer (computerized)

## Level – I

- 1. Module name** : **Repair, maintenance & field operation of Spraying and dusting equipments.**
- 2. Sector** : **AGRICULTURAL SECTOR**
- 3. Code** : **AGR111**
- 4. Entry Qualification** : **Minimum 5<sup>th</sup> standard and 14 years of age**
- 5. Terminal competency** : **Successful candidate would be able to carry out repair maintenance & field operation of Spraying and dusting equipments.**
- 6. Duration** : **150 hours**

### 7. COURSE CONTENT :

➤ <b>Practical Competencies</b>	➤ <b>Underpinning Knowledge(Theory)</b>
<ul style="list-style-type: none"> <li>➤ Practice health &amp; safety select, use, maintain and storage tools, equipments and clothing safety.</li> <li>➤ Identify different components of Sprayer &amp; duster.</li> <li>➤ Dismantle and assemble the common type of Sprayer &amp; duster.</li> <li>➤ Repair the Sprayer &amp; duster.</li> <li>➤ Calibrate the sprayer &amp; duster</li> <li>➤ Adjust Sprayer &amp; duster.</li> <li>➤ Field operation of Sprayer &amp; duster.</li> <li>➤ Field operation of Aero Blast and High clearance Sprayers.</li> <li>➤ Field operation of self propelled light weight sprayer.</li> <li>➤ Faults and remedies of Sprayer &amp; duster.</li> <li>➤ Precaution while handling insecticide and pesticide .</li> </ul>	<ul style="list-style-type: none"> <li>➤ Knowledge on health &amp; safety precautions observed in workshop &amp; field.</li> <li>➤ Familiarization with different Spraying &amp; dusting equipments.</li> <li>➤ Common type of Sprayer &amp; duster.</li> <li>➤ Working Principal and Constructional details of common types of Sprayer &amp; duster.</li> <li>➤ Method of calibration of Sprayer &amp; duster.</li> <li>➤ Adjustments of Sprayer &amp; duster.</li> <li>➤ Types of pumps used in sprayer</li> <li>➤ Methods of operation of different sprayer.</li> <li>➤ Methods of operation of duster .</li> <li>➤ Care and maintenance of sprayer &amp; duster.</li> <li>➤ Trouble shooting and remedies</li> <li>➤ Common accidents and their prevention.</li> <li>➤ Precautions while using sprayer &amp; duster in the field.</li> </ul>

## TOOLS & EQUIPMENTS

S.No.	Item
1.	Steel Rule 30 cm, English and metric
2.	Screw driver 20 cm x 9mm blade
3.	Screw driver 30 cm x 9mm blade
4.	Pliers combination 20 cm
5.	Circlip pliers Expanding and contracting type 15 cm and 20 cm each 8 sets.
6.	Hand file 20 cm. Second cut half round
7.	Hand file 20 cm. Smooth triangular
8.	Hand file 30 cm bastard flat
9.	Hand file 30 cm bastard round
10.	Steel tool box with lock & key(folding type) size 400x200x150mm
11.	Allen Key set of 12 pieces (2mm to 14 mm)
12.	Scriber 15 cm with scribing block universal
13.	Pick punch 15 cm 2nos.
14.	Drift punch copper 15 cm
15.	Centre punch 10 mm dia x 100 mm
16.	Chisel cold flat 20 mm
17.	Chisels Cross cut 200mm x 6 mm
18.	Hacksaw frame adjustable for 30 cm blade
19.	Hand vice 37 mm
20.	Drill Twist (assorted)
21.	Drill electric hand 6-12 mm
22.	Electric pedestal grinder with two wheel
23.	Hand reamer adjustable 10.5 to 11.25 mm, 11.25 to 12.75mm, 12.75 to 14.25mm and 14.25 to 15.75mm.
24.	Copper Hammer
25.	Cross peen Hammer 1 kg
26.	Spanner D E set of 12 pieces (6mm to 32 mm)
27.	Ring spanner set of 12 pieces (6mm to 32 mm.)
28.	Spanner, adjustable 20 cm.
29.	Spanner adjustable (pipe wrench) 350 mm
30.	Spanners socket of 8 with handles, T bar and ratchet
31.	Oil can 0.5-liter cap
32.	Grease Gun Hand/Pneumatic
33.	Measuring tape
34.	Water measuring beaker
35.	Cleaning trays 45 x 30 cm.
36.	Stud remover.
37.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
38.	Hand, Foot, Knapsack sprayer
39.	Power sprayer
40.	Mini blower
41.	Aero Blast sprayer
42.	Self propelled light weight high clearance sprayer
43.	Bellow, rotary type duster
44.	Power type duster



## LEVEL – I

- 1. Module name** : **Basic Cultivation for Cereal Crops.**
- 2. Sector** : **AGRICULTURAL SECTOR**
- 3. Code** : **AGR102**
- 4. Entry Qualification** : Minimum 5<sup>th</sup> standard and 14 years of age
- 5. Terminal competency** : Successful candidate would be able to carry out Cultivation for Serial Crops Equipments.
- 6. Duration** : 160 hours

### 7. COURSE CONTENT:

<b>Practical Competencies</b>	<b>Underpinning Knowledge(Theory)</b>
<ul style="list-style-type: none"><li>➤ Practice health &amp; safety select, use, maintain and store tools, equipments and clothing safety.</li><li>➤ Familiarization with tillage, Seeding Planting, Harvesting equipments.</li><li>➤ Driving practice of Tractor.</li><li>➤ Field Operation of tillage equipments.</li><li>➤ Field Operation of leveling equipments .</li><li>➤ Field Operation of Seeding and Planting equipments.</li><li>➤ Field operation of Sprayer and duster.</li><li>➤ Uses of sprinkler and dip Irrigation.</li><li>➤ Use of Fertilizers applicator.</li><li>➤ Field operation of different types of Harvesting .</li><li>➤ Use of Cleaner grader .</li><li>➤ Storage of Wheat, Paddy, Maize, Bazra and Jawar.</li></ul>	<ul style="list-style-type: none"><li>➤ Knowledge on health &amp; safety precautions and first aid</li><li>➤ Purpose of Tillage.</li><li>➤ Importance of tillage.</li><li>➤ Types of soils for different crops .</li><li>➤ Methods of preparation of seed – bed for wheat, maize, bazra and paddy .</li><li>➤ Methods of calibration for drill and planter.</li><li>➤ Methods of field operation of drill and planter.</li><li>➤ Methods of Irrigation system.</li><li>➤ Methods of spraying and dusting .</li><li>➤ Use of Fertilizers applicator.</li><li>➤ Field operation of reaper/reaper winder .</li><li>➤ Field operation of combine harvester.</li><li>➤ Study of cleaner and grader.</li><li>➤ Care and maintenance.</li><li>➤ Trouble shooting and remedies .</li></ul>

## TOOLS & EQUIPMENTS

S.No.	Item
1.	Tractor
2.	Steel Rule 30 cm, English and metric
3.	Screw driver 20 cm.x 9mm blade
4.	Screw driver 30 cm x 9mm blade
5.	Pliers combination 20 cm
6.	Vice grip pliers.
7.	Circlip pliers Expanding and contracting type 15 cm and 20 cm each 8 sets.
8.	Hand file 20 cm. Second cut half round
9.	Hand file 20 cm. Smooth triangular
10.	Hand file 30 cm bastard flat
11.	Hand file 30 cm bastard round
12.	Steel tool box with lock & key(folding type) size 400x200x150mm
13.	Allen Key set of 12 pieces (2mm to 14 mm)
14.	Engineer's square 15 cm blade
15.	Divider spring joint 15 cm.
16.	Scriber 15 cm with scribing block universal
17.	Pick punch 15 cm 2nos.
18.	Drift punch copper 15 cm
19.	Centre punch 10 mm dia x 100 mm
20.	Chisel cold flat 20 mm
21.	Chisels Cross cut 200mm x 6 mm
22.	Hacksaw frame adjustable for 30 cm blade
23.	Hand vice 37 mm
24.	Drill Twist (assorted)
25.	Drill electric hand 6-12 mm
26.	Electric pedestal grinder with two wheel
27.	Electric arc welding set portable
28.	Air Compressure
29.	Air Pressure Gauge
30.	Taps and Dies complete set in a box (metric) with handle.
31.	Hand reamer adjustable 10.5 to 11.25 mm, 11.25 to 12.75mm, 12.75 to 14.25mm and 14.25 to 15.75mm.
32.	Copper Hammer
33.	Ball peen Hammer 0.5 Kg.
34.	Cross peen Hammer 1 kg
35.	Sledge Hammer
36.	Spanner D E set of 12 pieces (6mm to 32 mm)
37.	Ring spanner set of 12 pieces (6mm to 32 mm.)
38.	Spanner, adjustable 20 cm.
39.	Spanner adjustable (pipe wrench) 350 mm
40.	Spanners socket of 8 with handles, T bar and ratchet
41.	Horses and wheel choke
42.	Screw jack 4 ton capacity double lift
43.	Oil can 0.5-liter cap
44.	Grease Gun Hand/Pneumatic
45.	Cleaning trays 45 x 30 cm.
46.	Stud remover.
47.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
48.	Pullers screw powered 2mm with bearing puller attachment.
49.	Bearing puller screw powered/hydraulic powered with attachments
50.	Angle measuring instrument
51.	Ploughs
52.	Disc Harrow tandem and off set
53.	Spike tooth harrow – Power harrow
54.	Cultivator (shovel type and sweep type)
55.	Leveler
56.	Bund maker
57.	Seed drill
58.	Planter
59.	Trans-planter
60.	Sprayer (Knapsack & Power Operated)
61.	Rotary Duster
62.	Centrifugal pump with motor
63.	Submersible pump
64.	Reaper/Reaper winder
65.	Threshers for different crops
66.	Tractor Operator Combine Harvester
67.	Diesel Engine/Generator Set
68.	Tractor trailer (hydraulic operated)

**Constitution of the Trade Committee for Agriculture Sector under SDI – MES  
Scheme held at Ludhiana on 22<sup>nd</sup> October, 2008**

Sl No.	Name S/Sh	Designation	Office
1	Ashok Kumar	Dy. Director General (T)	DGE&T
2	B. Prasad	Director	ATI Ludhiana
3	DP sabharawal	Director Apprenticeship Training	DGE&T
4	S.S Ahuja	HOD	PAU Ludhiana
5	Dinesh Nijhawan	Joint Director of Training	DGE&T
6	Ms.Kamlesh Bhandari	Addl Director	Director (Punjab)
7	Sukhdev Singh	Deputy Director of Training	ATI Ludhiana
8	DK Ojha	Deputy Director of Training	ATI Ludhiana
9	Manjit Singh	Deputy Director of Training	ATI Ludhiana
10	Ram Raj	Deputy Director of Training	Ludhiana
11	JP Srivastava	Sr. General Manager	HMT Pinjore
12	KP Singh	Asst. General Manager	HMT Pinjore
13	CP Sharma	Joint Director of Training	ATI Ludhiana
14	Baldev Singh Hunjan	Representative	Bharat Indl.Corp.Lud
15	Gurcharan Singh	Training Officer	
16	Dr. Baldev Dogra	Dept. of FPM	PAU Ludhiana
17	Dr. H S Siddhu	Research Engineer	PAU Ludhiana
18	Dr. Charanjeet S Pannu	Research Engineer	PAU Ludhiana
19	Dr. I.S Diuliwal	Dept. of FPM	PAU Ludhiana
20	Dr Gursahib Sigh	Research Engineer	PAU Ludhiana
21	Dr. Rohinish Khurana	Associate Professor	PAU Ludhiana
22	Vishal Bector	Asstt. Engineer, Dept. of FPM	PAU Ludhiana
23	Satnam Singh	Popular Engg. Works	Ludhiana
24	Dr. S S Thakur	Research Engineer, Dpt. FPM	PAO Ludhiana

## Level - I

### Module No- I

Name	:	<b>Land Scaping &amp; Floriculture</b>
Sector	:	<b>Agriculture</b>
Code	:	<b>AGR129</b>
Entry Qualification	:	8 <sup>th</sup> Std. + 14 years of age
Age	:	14 years and above
Terminal Competency	:	On completion of training he will be able to 1) Layout landscaping and development of ornamental gardens. 2) To cultivate commercial flowers.
Duration	:	300 hours

#### **CONTENTS:**

<b>Practical</b>	<b><i>Theory</i></b>
Demonstration of different types of landscaping. Identification of ornamental plants. Selection of plants and Avenue trees based on landscape value. Propagation by cutting, budding, grafting, etc.	Knowledge of General Safety, health and hygiene. Fundamentals of Floriculture: Introduction and scope of floriculture (cut flowers, pot plants, seeds and bulbs, Landscaping, indoor plants). Landscaping & Indoor Gardening: Importance and scope. History & styles of gardens, famous gardens. Features and components of gardens. Home gardens and garden structures. Selection of plants based on landscape value and uses. Handling of soils, preparation of nursery bed, potting media, potting etc. manures and fertilizers, Irrigation. Propagation by cutting, budding, grafting.
Identification of indoor and bonsai plants. Culture of Pot plants and bonsai.	Plant Materials and their Cultivation: Importance of identification and classification. Description of the categories of ornamental plants, lawns, pot plants, cut flower crops, bulbous plants, annuals and other bedding plants, rock garden plants and aquatic plants.
Identification of seeds & testing viability. Seed treatment, soil treatment before sowing.	Nursery and Seed Production: Importance of Nursery and seed production, selection of site for open and covered culture. Soil preparation, soil sterilization, preparation of soil mixture for seed sowing and pot plants. Seed production methods for pure seed, harvesting, cleaning, seed testing, germination test and packing. Seedling production methods for annuals and other herbaceous ornamentals and their methods of packing. Selection of Nursery sites & structures.
Seed sowing in beds and containers.	Different diseases and symptoms. Management of

Common garden operations.	insect pests, diseases and weeds, specific cultural operations, harvesting, grading, pulsing, storage.
Diseases and pest management. Top dressing (application of fertilizers for specific flower crops). Pinching and disbudding in specific flower crops.	
Identification of important commercial varieties of the flowering crops(Marigold, tuberose, gladioli and rose). Preparation of ground and beds for planting specific flower crops. Packing of the following commercially important flowers: For loose flowers: Jasmines, Chrysanthemums, Rose, Crossandra, Marigold, aster, Tuberose, gladioli, Dahlia, Hibiscus.	Commercial Flowers: Scope, importance, cultivars, soil and climatic requirements, propagation, nutrition and water management, Maintenance of gardens and lawns. Avenue trees. Indoor gardens, terrace gardens, window gardens, trough/bottle garden, aquarium, baskets, mini landscape, Rock Gardens. Selection and arrangements of indoor pot plants, their care and recycling.
Field Tours.	
Floral arrangement ( ornaments, bouquets etc.)	
Preparation and Maintenance of gardens and lawns.	
Demonstration of poly houses, net houses, tunnels etc.	
Postharvest handling of flowers and ornamental plants	

### List of Tools & Equipment (Batch of 20 Trainees)

Sl. No.	Description of Item	Quantity
<b>A) Tools &amp; Implements</b>		
1.	Kassi / Spade	20 nos.
2.	Khurpi	20 nos.
3.	Hand hoes	20 nos.
4.	Saw	20 nos.
5.	Watering Can	05 nos.
6.	Rose Can	05 nos.
7.	Grass Cutter	20 nos.
8.	Budding & Grafting Knives	10 nos.
9.	Secateur	10 nos.
10.	Forceps	05 nos.
11.	Buckets	10 nos.
12.	Edge Cutter	02 nos.
13.	Tree Pruner	02 nos.
<b>B) Farm Structures</b>		
14.		
15.	Poly House with Misting Unit	01 no.
16.	Shed net house	01 no.
<b>C) Farm Equipment</b>		
17.	Power Triller with Bowing Attachment	01 no.
18.	Wheel Barrow	01 no.
19.	Hand Sprayer (Small)	05 nos.
20.	Foot Sprayer	02 nos.
21.	Hand Gloves	20 nos.
22.	Balance	01 no.
23.	Sieve / Stainer	02 nos.
<b>D) Miscellaneous Farm Supplies</b>		
24.	Earthen Pots	100 nos.
25.	Plastic Pots	100 nos.
26.	Polythene Bags	500 nos.

27.	Seed Packets	1000 nos.
28.	Brown paper bags	1000 nos.
29.	Gunny bags	10 nos.
30.	Tags-labels	100 nos.
31.	Thread balls	12 nos.
32.	Budding-tape	10 nos.
33.	Sirki	10 nos.
34.	Bamboos	20 nos.
35.	Boxes (Packing)	10 nos.
36.	Sutli	05 kgs.
37.	Moss-grass	05 kgs.
38.	Polythene roll	01 no.
39.	Tags-label (Metallic)	100 nos.
40.	Tray	10 nos.
41.	Grass Mower	01 no.
E) Laboratory Equipment		
42.	Refrigerator	01 no.
F) Glass Wares		
43.	Beakers	05 nos.
44.	Measuring Cylinder	05 nos.
G) Chemicals		
45.	Growth regulators: G.A., N.A.A., I.A.A., I.B.A., Routine Hormone	01 bottle each
H) Identification Materials		
46.	Flower Germ Plasm	
47.	Seed material	
48.	Packing materials	
I) Accessories for flower arrangement		
49.	Different types of flower containers	
50.	Flower vases	
51.	Pin holder	
J) Laboratory Misc. Supplies		
52.	Duster	20 nos.
53.	Soap	20 nos.
54.	Cotton balls	10 nos.
55.	Filter paper (Packs)	10 nos.
56.	Filter cloth	10 mtrs.

## Level - I

### Module No-II

Name : **Fruit Cultivation**  
Sector : **Agriculture**  
Code : **AGR 130**  
Entry Qualification : **7<sup>th</sup> class pass**  
Age : **14 years and above**

Terminal Competency : on completion of training the trainees will be able to

1. Identify the recommended varieties of fruit trees for growing area and management of cultural practices for home orchards.
2. Identify insects and diseases in home orchards and their management.
3. Propagate and establish and manage fruit orchards.

Duration : **300 hours**

#### **CONTENTS:**

<b>Practical</b>	<b>Theory</b>
Visiting to the Orchards. Safety, health and hygiene related to fruit cultivation.	Knowledge of General Safety, health and hygiene Importance of fruits, scope (Study of soil and climate), present status & future prospects.
Studying biological behaviour of fruit trees	Culture of major fruit crops.
Layout of orchards & planting of fruit trees	Botany & morphological characters of different fruit crops.
Layout of different systems of irrigation for young bearing orchard	Crop Husbandry.
Performing intercultural operations in the fruit trees and mulching in fruit orchards.	Plant propagation & Nursery Management
Method for manuring of different plants	Planning & Management of Nursery.
Foliar application. Identification of spraying equipments.	Water requirement of various fruit crops, method of irrigation & type of irrigation, Use of drip irrigation
Practices of different implements & Horticultural tools	Propagation through tissue culture & use of genetical engineering.
Identification of different / common fertilizers and pesticides	Use of growth regulators in fruit culture.
Identification & controlling of important diseases	Inter cropping of fruit orchards.
Identification & controlling of different insect pests	Orchard problems. their remedies
Studying different propagation methods	INM (Integrated nutrient management) in fruit plantation. Fortigation
Practicing of stone, veneer & side grafting	IPM in fruit cultivation. Organic fruit cultivation

in mango	
Studying fruit settings & fruit drops in citrus, guava & mango	Planning & layout of different model orchards for some major fruit crops
Observing some orchard problems	Model nutrition garden for healthy living.
Calculating the cost of cultivation of different fruits	
Studying marketing of fruits & scope for commercial cultivation for different fruits in the state	Evaluation & discussion, feedback collection & valediction.
Processing & canning of different fruit products. Package of practices.	Post harvest technology in fruit crops. Processing & canning of fruits

**LIST OF TOOLS AND EQUIPMENT** (For a batch of twenty trainees)

Sl. No.	Item	Quantity
1.	A selection of Gardening Tools	01 sets
2.	Cleaning Tools and Treatments	01 nos
3.	Cutting and Pruning	10 sets
4.	Forks and Cultivators from Sneeboer	01 nos
5.	Garden Footwear	05 nos
6.	Garden Storage, Protective Covers, Tarpaulins and Accessories no	01
7.	Gardening Gloves, Gauntlets, Aprons and Tool Bags	05 sets
8.	Gardening Hand Tools	05 sets
9.	Plant Labels, labellers, Copper Labels and Tape nos	20
10.	Plant Supports, Ties and Twine	05 nos
11.	Shears and Loppers, Hedge Trimmers	05 nos
12.	Spades and Bulb Planters nos	01
13.	Spades, Forks and Trowels sets	05
14.	Tidying and Collecting, Paths and Sacks	05 sets
15.	Capillary Matting and Polythenes no	01
16.	Garden Hose Connectors and Fittings	As required
17.	Garden Hose Pipes required	As
18.	Garden Water Butts and Accessories	As required
19.	Gardena Micro Drip and Spray Watering Systems set	01
20.	Gravity Fed Drip Systems sets	02
21.	Mains Fed Drip and Spray Watering Systems	01 set
22.	Tap Connectors and Tap Adaptors no	01
23.	Water Pumps and Equipment	01 no



**Level-I****Module No-III**

Name	:	<b>Seed Production</b>
Sector	:	<b>Agriculture</b>
Code	:	<b>AGR 131</b>
Entry Qualification	:	<b>8<sup>th</sup> class pass</b>
Age	:	<b>14 years and above</b>
Terminal Competency	:	After completion of the training, the trainees will be able to produce quality seeds
Duration	:	<b>180 hours</b>

**CONTENTS:**

<b>Practical</b>	<b>Theory</b>
Identification of seeds seedlings, saplings etc	Knowledge of General Safety, health and hygiene Introduction: Importance of seed in Agricultural production Seeds, seedlings, saplings, identification of seeds etc
Identification of clones-suckers, roots, stems, búbils, rhizomes, corms, tubers etc	<b>Classification of seeds/ planting materials. Planting materials other than seeds: use of clones-suckers, roots, stems, búbils, rhizomes, corms, tubers etc</b>
Identification of Land races, improved, composite, hybrids, hi-tech seeds	<b>Classification of seeds: Land races, improved, composite, hybrids, hi-tech seeds</b>
Field preparation, pit preparation, Management of seed bed/nursery & after care	Seed certification: Importance, Source verification, Field Inspection, i.e. i. spacing, ii. Purity maintenance, iii. Rouging, iv. Diseases & pests, <b>v. Post harvest guidance</b>
<b>Seed certification: Source verification, Field inspection: i. spacing, ii. Purity maintenance, iii. Rouging, iv. Diseases &amp; pests, v. post harvest guidance</b>	Seed processing, treatment, packaging & storing Seed Testing:
<b>Seed processing, treatment, packaging &amp; storing: Prctice on a. Sampling, b. Testing &amp; Tagging, i.e. i. Purity – physical, ODV, ii. Germination iii. Moisture, iv. Disease &amp; pests, v.</b>	Seed/Processing of production: Selection of crop / varieties. Seed processing, treatment, packging and storing. Seed testing: a. Sampling, b. Testing & Tagging, i.e. i. Purity – physical, ODV, ii.

<b>standards Notified</b>	Germination, iii. Moisture, iv. Disease & pests, v. standards Notified
<b>Visit to Nursery, Processing plant &amp; Seed testing Laboratory</b>	Selection of seed class: i. Nucleous, ii. Breeders, iii. Foundation, iv. Certified- I, II, V, TL
Selection of planting materials other than seeds. Package practices.	Field preparation, Management of seed bed / nursery & after care
	Post harvest care
	Seed Law / Act

**LIST OF TOOLS AND EQUIPMENT (For a batch of twenty)**

Sl. No.	Item	Quantity
1.	<b>Seed sample jars</b>	<b>20 nos</b>
2.	<b>Seed processing plant</b>	<b>01 no</b>
3.	<b>Sieves &amp; Grader</b>	<b>01 set</b>
4.	<b>Gunny, poly packs &amp; cloth bags</b>	<b>as required</b>
5.	<b>Seed treating drum</b>	<b>01 nos</b>
6.	<b>Seed sample drawers (Auger, winnower, cloth bag, tags &amp; strings &amp; seal)</b>	<b>01 set</b>
7.	<b>Germinator</b>	<b>01 no</b>
8.	<b>Incubator (Hand lence)</b>	<b>01 no</b>
9.	<b>Petridishes</b>	<b>10 nos</b>
10.	<b>Wts &amp; measuring equipments</b>	<b>01 set</b>
11.	<b>Different country receptacles</b>	<b>05 nos</b>
12.	<b>Storage bins</b>	<b>01 no</b>
13.	<b>Stitching machines</b>	<b>01 no</b>

Level -I

Module No-IV

Name : **Mushroom Cultivation**

Sector : **Agriculture**

Code : **AGR 132**

Entry Qualification : **5<sup>th</sup> class pass**

Age : **14 years and above**

Terminal Competency :  
After completion of training the trainees will be able

- To produce different kind of mushrooms

Duration : **90 hours**

**CONTENTS:**

<u>Practical</u>	<u>Theory</u>
<b><u>Selection and Processing of straw for bed preparation</u></b>	<b>Knowledge of General Safety, health and hygiene</b> <b>Importance of Mushroom, scope, past, present status &amp; future prospects.</b> <b>Pros &amp; cons in Mushroom cultivation: why the Mushroom cultivation? Problems in mushroom cultivation &amp; its remedies.</b> <b>Mushroom for health: ingredients in mushroom, i.e. Protein, Carbohydrate, Fiber, Fat, Vitamins, Minerals etc.</b> Types of Mushroom. Poisonous Mushroom. Cultivation of Paddy Straw Mushroom and ingredients used Oyster Mushroom Cultivation and ingredients used. Milky Mushroom Cultivation and ingredients used. Button Mushroom cultivation and ingredients used
Sterilization process practice	
Preparation of beds for cultivation of various mushrooms and its maintenance	
Identification of viable Spawn	
Post Harvesting care and processing Visit to Mushroom farms	Preservation of Mushroom. Economics of Mushroom cultivation.

## LIST OF TOOLS AND EQUIPMENT (For a batch of twenty Trainees)

Sl. No.	Item	Quantity
1.	Measuring tape	05 no
2.	Mushroom Grow Rooms	02 nos
3.	Exhaust Fan	01
4.	Desert cooler	01
5.	Thermometers	02 no
6.	Hygrometers	02 no
7.	Luxmeter	02 no
8.	Box for Mushroom Transportation	01 set
9.	Straw immersion tank	01 no
10.	Tulu Pump set	01 no
11.	Sprayer	01 no
12.	Chaff Cutter	03 nos
13.	Bamboo for platform	as required
14.	Polythene	as required
15.	Paddy straw	as required
16.	Spawn bottles	as required
17.	Chemicals for sterilization and processing	as required
18.	Weighing balance	01 no

**Level -I**

**Module No-VI**

Name	:	<b>Biofertilizer</b>
Sector	:	<b>Agriculture</b>
Code	:	<b>AGR 134</b>
Entry Qualification	:	<b>8<sup>th</sup> class</b>
Age	:	<b>14 years and above</b>
Terminal Competency	:	On completion of training he will be able to produce biofertiliser
Duration	:	<b>120 hours</b>

**CONTENTS:**

<u>Practical</u>	<u>Theory</u>
Preparation of inoculants: Isolation, screening and enrichment of strains, Strain selection and its maintenance, Preparation and maintenance of mother culture, Preparation of broth and sterilization, Inoculation of broth, Blending of broth with carrier, Filling, sealing and curing of blended material, Packing in boxes, Storage, transportation & distribution.	Knowledge of General Safety, health and hygiene Introduction:- What is Biofertilizer? Importance of biofertiliser in agriculture. Isolation, screening and enrichment of strains, Strain selection and its maintenance, Preparation and maintenance of mother culture, Preparation of broth and sterilization, Inoculation of broth, Blending of broth with carrier,
Application Technology of inoculants: Seed treatment, Seedling/set treatment, Soil treatment	Rhizobium inoculants, Azotobacter inoculants Azospirillum Inoculants Blue-green Algal Inoculants (BGA) Azolla – an organic matter Green manure Phosphate Solubilizing Micro-organisms (PSM) Potash solubilizing Bacteria. Mycorrhizal Fungi
Field Application of Biofertilizer in different crops: Demonstration on nodule formation on legume crop Demonstration on Green manure application.	Mode of Field Application of Biofertilizer in different crops: Recommended Biofertilizer, its dose, Method of Application, Quantity required/ use of each Biofertilizer, Time of Application.
<b>Exposure visit</b>	

Demonstration on decomposition of organic matter by bioagents	Organic matter and composting: Biofertilizer for decomposing organic matter to make available macro and micro nutrients.
	Favorable conditions required for higher efficiency of Biofertilizer.
Introduction to vermicomposts	Advantage of Biofertilizer.
	Economics of Biofertilizer.
	Application Technology: Seed treatment, seedling/set treatment, soil treatment, precaution during use of Biofertilizer, Doses of Biofertilizer for different crops.
	Guidance and precautions in use of Biofertilizer.
	Biofertilizer manufacturing units founded under the Biofertilizer projects in the state & country.
	Other Biofertilizer production units in the state & India.
	Standards for different inoculants.

**LIST OF TOOLS AND EQUIPMENT** (For a batch of twenty trainees)

<b>Sl. No.</b>	<b>Item</b>	<b>Quantity</b>
1.	<b>Azolla Tank</b>	<b>As required</b>
2.	<b>BT Tank</b>	<b>As required</b>
3.	<b>Polythene sheet</b>	<b>As required</b>
4.	<b>Watering system</b>	<b>As required</b>
5.	<b>Spade</b>	<b>As required</b>
6.	<b>Chopper</b>	<b>As required</b>

## Level -I

### Module No-VII

Name : **Medicinal Plant**

Sector : **Agriculture**

Code : **AGR 135**

Entry Qualification : **8<sup>th</sup> class**

Age : **14 years and above**

Terminal Competency : On completion of training the trainees will be able

- To identify, propagate and cultivate important aromatic and medicinal plant

Duration : 300 hours

#### **CONTENTS:**

<b>Practical</b>	<b>Theory</b>
Identification of medicinal and aromatic plants	Knowledge of General Safety, health and hygiene Introduction to Medicinal & Aromatic Plants: production & productivity of different Aromatic and medicinal plants, Nutritional composition & value of Conventional and unconventional herbal plants, climate and species distribution,
Demonstration on Plant Morphology (root, Stem, Leaves, Inflorescence, Flowers, Fruits and seeds ) Demonstration on Propagation methods	Propagation: Different methods of vegetative propagation of medicinal & aromatic plants, Importance of vegetative propagation, Micro propagation of medicinal & aromatic plants, Methods, development of tissue culture, possible methods of improving yield, selection of strains, etc., role of hormones in propagation & crop production. Purpose and importance of herbaria
Nursery management. Raising of medicinal and aromatic plants.Practice on all cultural operations on Aswagandha, sarpagandha, Basaka, Citronella, Mentha, Aloe vera, etc	<b>Cultivation:</b> Present situation of cultivation of different medicinal & aromatic crops. Soil and Climate, variety, planting materials, planting time, land preparation, spacing, manures & fertilizers intercultural operation Propagation/Nursery Transplantation, Irrigation and Weeding, Cropping Sequence, harvesting, storage, marketing, economics etc. & field management. Harvesting, post harvest operations, storing, packaging, marketing.
Identification of fresh plants, collection of sample, specimen	

preparation and preservation in Herbarium.	
Identification and management of diseases and pest in medicinal plants.	<b>Pest Management:</b> Pests and Diseases, concept of plant protection in general, integrated pest management (IPM), biocontrol agents & biopesticides. Method, doses & time of application.
Demonstration on harvesting, collection, processing, storing, and packaging.	<b>Raw Material Resources &amp; Collection, Primary Health Care &amp; Herbs:</b> Method & time of collection of Seeds, processing & value addition methods, Underground parts: Roots, tubers, Bark, Leaves, Flowers, Seed & Fruits, Exudates & gums, Wood & wood extracts
Preparation value added products from medicinal plants	
Field visits	

### **LIST OF TOOLS AND EQUIPMENT** (For a batch of twenty)

<b>Sl. No.</b>	<b>Item</b>	<b>Quantity</b>
1.	Cutting and Pruning tools	10 sets
2.	Forks and Cultivators	01 nos
3.	Garden Footwear - Clogs and Shoes	05 nos
4.	Garden Protective Covers, Tarpaulins and Accessories	As required
5.	Gardening Gloves, Gauntlets, Aprons and Tool Bags	05 sets
6.	Plant Labels, labellers, Copper Labels and Tape	20 nos
7.	Shears and Loppers, Hedge Trimmers	05 nos
8.	Spades and Bulb Planters	01 nos
9.	Spades, Forks and Trowels	05 sets
10.	Capillary netting and Polythenes	01 no
11.	Garden Hose Connectors and Fittings	As required
12.	Garden Hose Pipes	As required
13.	Garden Water Butts and Accessories	As required
14.	Drip and sprinkler irrigation system	01 set
15.	Tap Connectors and Tap Adaptors	01 no
16.	Water Guns, Nozzles and Lances	As required
17.	Water Pumps and Equipment	01 no
18.	Watering Cans and Garden Sprayers	01 no



**Level - I**  
**Module No- IX**

Name : **Vermiculturing and Vermicomposting**

Sector : **Agriculture**

Code : **AGR 137**

Entry Qualification : **5<sup>th</sup> class pass**

Age : **14 years and above**

**Terminal Competency :** After completion the trainee will be able to produce quality Vermicompost and Vermiwash.

Duration : **90 hours**

**CONTENTS:**

<b>Practical</b>	<b>Theory</b>
<b>Collection of wastes &amp; their segregation &amp; processing</b>	Knowledge of General Safety, health and hygiene Concept of Vermitechnology: What & Why. Definition and justification- Vermitechnology, vermicomposting and rearing. Importance of Vermicompost in Agri-horticultural practices. Vermicomposting for Organic Farming - an Eco-Friendly Approach Vermicomposting for Rural Development Waste materials: Classification, disposal techniques & their impact on environment Earthworms: Type, identification & usefulness Anaerobic (Pit) & Aerobic (Heap) composting: techniques & their comparison Vermiculturing: Techniques & importance Vermicomposting techniques, standard composition of vermicompost
Bed preparation for Anaerobic & Aerobic composting	
Fortnightly mixing of beds	
Bed preparation for Vermicomposting. Four-chambered tank/pit system, etc.	
Earthworm collection & application on beds	
Inspection of beds & watering	
Vermicompost collection, Earthworms separation, Air drying of vermicompost, sieving & storing	
Vermi-wash collection & processing	Vermi-wash production techniques, standard composition of vermiwash

	Economics on Vermiculture and Vermicomposting
Repetition of Techniques for confidence building	
Visit to Vermicomposting Farm	Problems & prospects of Vermicomposting in India

**LIST OF TOOLS AND EQUIPMENT (For a batch of twenty)**

Sl. No.	Item	Quantity
<b>Ordinary Garden tools</b>		
1.	Spade	02 nos
2.	Shovel	02 nos
3.	Sieves	02 nos
4.	Packaging machine	01 no
5.	Stitching machine	01 no
6.	Bucket	02 nos.
7.	Vermicomposting shed, Platform, Tank	01 no
8.	Vermiwash collection tank/container	01 n0.

## LEVEL – I

### MODULE -X

#### Preservation of Fruits & Vegetables.

Name : Preservation of Fruits & Vegetables.

Sector : Agriculture and Allied Sector

Code : **AGR 138**

Entry Qualification & Age : Vth standard, 14 years & above

Duration : 240 hours

Terminal Competency :

- Identify, select, use and store tools, equipments and materials used in Fruit and vegetables Preservation in a safe manner in Cold Storage.
- Preserve seasonal fruits and Vegetables using drying process
- Produce pickles , Jam , Jelly, Murabbas, Syrups, Squash , Sauces, Chutneys and vinegar.
- Preserve seasonal fruits and vegetables for value added produces.

#### **CONTENTS**

<b>Practical</b>	<b>Theory</b>
Use of protective clothing and boots	Safety precautions, use of protective clothing and elementary first aid.
Maintain personal cleanliness & Hygiene Carry out basic first aid treatment/notifying accident Practice fire safety measures	Importance of personal cleanliness & Hygiene
Apply good house keeping practices, proper handling of materials and disposal of waste, follow statutory regulations for Cold Storage	Reasons for carrying out good housekeeping practices
Identify tools, equipments and materials used in Cold Storage system. Store /lay and use materials at work in safe manner	Functions and uses of various tools, equipment and selection and correct use of tools and equipment for Cold Storage
Use and store tools and equipments in	

<p>a safe manner</p> <p>Select proper tools, equipment and material for a particular task</p>	
<p>Check quality of raw materials as per standards (Materials: fruits , vegetables , sugar, salt, vinegar.)</p>	<p>Criteria for selection of fruits and vegetables for preservation. Estimate of weight, measures, ratio and proportion. Different methods of preservation used for domestic and industrial purposes. Advantages and limitations of each method. Equipment and tools used safety precautions to be taken. Dos and Don'ts during preservation. Quality checks to be carried out. Packing and labeling procedures.</p>
<p>Prepare the stuff for preservation process according to weight and proportions  (Prepare refers to: cleaning, peeling, cutting, pruning blanching, ratio of ingredients, mixing)</p> <p>Preserve seasonal fruits and Vegetables using various methods</p> <p>Pack and label according to regulations</p> <p>Prepare the stuff for pickles according to weight and proportions (Prepare refers to: cleaning, cutting, ratio of ingredients, mixing)</p>	<p>Seasonal fruits and vegetables suitable for making pickles. Criteria of selection of fruits and vegetables for making pickles. Quantity and proportion of raw materials for different pickles. Equipment and tools used. Methods of preparation of pickles. Dos and Don'ts. Quality checks to be carried out. Packing, bottling and labeling procedures.</p>

<p>Prepare pickles of fruits and vegetables using oil, vinegar, salt as preservatives as well as without using oil</p> <p>Pack, bottle and label according to regulations</p> <p>Prepare the stuff for Jam, Jelly, Murabbas and Syrups according to weight and proportions (Jam-cleaning, peeling, boiling. Jelly-cleaning, boiling, pectin, extraction Murabas- cleaning, soaking pricking , Syrups-mixing (rose and khus)</p> <p>Produce, Jam, Jelly, Murabbas and Syrups using sugar preservatives</p> <p>Pack, bottle and label according to regulations</p>	<p>Criteria for selection of fruits, vegetable, chemicals and raw materials for Producing Jam, Jelly, Murabbas and Syrups. Proportion of chemical and raw materials required. Equipment and tools used. Methods of preparation of jam, murabba and syrups in right sequence. Reasons for spoilage, remedies and quality check. Dos and Don'ts. Quality checks to be carried out. Packing, bottling and labeling procedures.</p>
<p>Prepare the stuff for Squash, Sauces, Chutneys according to weight and proportions</p> <p>(Squash –cleaning, peeling Sauces-cleaning, boiling, chutneys-cleaning, peeling, cutting)</p> <p>Produce Squash, Sauces, Chutneys using chemical preservatives</p> <p>Pack, bottle and label according to regulations</p>	<p>Criteria for selection of fruits, vegetable, chemicals and raw materials for producing Squash, Sauces, Chutneys. Proportion of chemical and raw materials required. Equipment and tools used. Methods of preparation of Squash, Sauces, Chutneys in right sequence. Reasons for spoilage, remedies and quality check. Dos and Don'ts. Quality checks to be carried out. Packing, bottling and labeling procedures.</p> <p>Importance and methods of storage, packaging and bottling</p> <p>Selection and methods of sterilization of bottles</p>
<p>Prepare vinegars (Vinegars: synthetic, fermented vinegar, fruit vinegar)</p> <p>Prepare products from wastes e.g. Vinegar from pineapple waste, pectin from citrus fruits wastes, vinegar and protein isolate mango kernel, starches.</p> <p>Test quality of products made</p>	<p>Different types of vinegars and methods of vinegar production. Factors involved in producing good quality vinegar.</p> <p>Processing techniques for proper utilization of wastes from fruits and vegetables.</p>

Maintenance and care of equipment	
List out the materials required to produce a given product	
Estimate cost of materials required	
Estimate man power and time required for completing the work	
Estimate labour cost, overheads and cost of utilities (Power, water)	
Estimate the total cost involved in production of a product	
Identify the possible agencies and other customers, who can purchase.	
Make a comparative study of the rates of other suppliers. Prepare a label according to requirement.	

### List of tools and equipment

(for 20 trainees)

S.No.	Name	Quantity
1	Working table (4 trainees per table)	5 Nos.
2	Demonstration table	1 No.
3	Proper electric & gas connection	As required
4	Cooking range	2 Nos.
5	Plastic tray for keeping ingredients	10 Nos.
6	Aluminum Hundi 10 Ltr. capacity	5 Nos.
7	Sink with drainage board	5 Nos.
8	Measuring jug 1 litre capacity plastic	5 Nos.
9	Measuring cylinder 10 ml capacity borosil glass	5 Nos.
10	Weighing scale	1 No.
11	Chopping board	1 No.
12	S.S Knife	10 Nos.
13	S.S Strainer	5 Nos.
14	Hand Blender	5 Nos.
15	Apple corer & cutter	10 Nos.
16	Lemon squeezer Plastic	5 Nos.
17	Scissors	5 Nos.
18	Muslin cloth	As required
19	Juice Extractor	1 No.
20	Funnel	10 Nos.
21	Fruit Peeler	5 Nos.
22	Rubber Spatula	5 Nos.
23	Tie up with Cold Storage Agency for training	
24	Wooden Spatula	5 Nos.
25	Thermo meter	5 Nos.

26	Filler	5 Nos.
27	Hand gloves Cotton	10 Nos.
28	S.S.Vessels	10 Nos.
29	Perforate Ladle	5 Nos.
30	Hand gloves Rubber	10 Nos.
31	Respiration Mask Nose and Mouth production	20 Nos.
32	Fruits scooper	10 Nos.
33	Clean Wiping cloth	10 Nos.
34	Vessel Tong	10 Nos.
35	Packing and sealing machine (for plastic pack)	1 No.
36	Refrigerator and Deep Freezer	1 No.
37	Canning Machine for Bottle and Tin Packing	1 No.

### Level -III

#### Module No. I

Name: **Entrepreneurship Development in Agri Business (EDAB)**

Sector : **Agriculture**

Code : **AGR 340**

Entry Qualification : Graduate in any discipline

Age : **20 years**

Terminal Competency :

- To train manpower for Entrepreneurship development activities in Rural and Urban sectors
- To prepare Young Entrepreneurs for self-employment
- To develop facilities for agri - production and sale & marketing of agri- products

Duration : **480 hours**

#### **CONTENTS:**

Practical	Theory
Hands on training on crop production, micro-irrigation system, management of poly house, shade net house, use of plastic, oil extractions. Post harvest management. Identification of various tools and accessories.	Knowledge of General Safety, health and hygiene Entrepreneurship Development Programme (EDP) on Horticulture: Motivational inputs, Distinction between Entrepreneur, Enterprise & Entrepreneurship, Qualities of a successful Entrepreneur, Achievement Motivation Training.
Exposure visit to different Nurseries, Farms, Research Stations, Laboratories, Processing Units, Export Market etc.	Orchard Management: Horticulture as Industry in India. Principles of Establishment of Orchards, Preparation of Fortified compost, Bio fertilizer & Vermi compost, Method of plant propagation for Horticulture crops. Nursery Management: Principles of Nursery Management, QPM Production. General Horticulture Techniques: Farm Mechanization, Establishment of Horticulture Service Centre, Protected Cultivation – Green House, Shade Net House, Mulching, Organic Farming.
Market Survey and cost analysis	Market Survey: How to conduct Market Survey for different Horticultural & Allied crops
Project Formulation: Preparation of Preliminary Project Report, Detailed	Business Opportunity Guidance (BOG), Product Selection, Project Identification. All verity of



Project Report, Presentation	Projects on Horticulture
Interaction with successful entrepreneur.	Vegetables & Spices Farming: Commercial Vegetables, Seasonal Vegetables, Off-season vegetables, Production of Exotic Vegetables- Gherkins, lettuce, capsicum, baby corn etc
Demonstration on different types of landscaping.	Landscape Horticulture: Principles of Landscaping & Landscaping as business
Demonstration on post harvest techniques fruits and vegetable and package techniques.	Post Harvest Management: Post Harvest management of Fruits, Flowers & Vegetables (washing & drying, sorting & grading, waxing, ripening, pre-packaging, transportation & storage)
<p><b><u>Cross occupational competency</u></b></p> <p><b>Development of Organizing and implementation of exercises/task</b></p> <ul style="list-style-type: none"> <li>• Systematic approach</li> <li>• Accuracy</li> <li>• Efficient work</li> <li>• Carefulness</li> <li>• Planning &amp; Organizing</li> </ul> <p><b>Development of Communication &amp; Cooperation</b></p> <ul style="list-style-type: none"> <li>• Suitable behaviour towards customers</li> <li>• Influence in skill</li> <li>• Creativity in presentation &amp; projection</li> <li>• Multi cultural skills</li> </ul> <p><b>Development of mental technique</b></p> <ul style="list-style-type: none"> <li>• Risk taking skill</li> <li>• Managing challenges</li> <li>• Ability to draw analogies</li> <li>• Thinking ahead</li> <li>• Ability to transfer</li> <li>• Creativity</li> </ul> <p><b>Development of independency &amp; responsibility</b></p> <ul style="list-style-type: none"> <li>• Ability to make judgment</li> <li>• Reliability</li> <li>• Holding an opinion</li> </ul> <p>Awareness of quality</p> <p><b><u>DEVELOPMENT OF OCCUPATIONAL COMPETENCY</u></b></p>	<p><b>Organizing and implementation of exercises</b></p> <p><b>Communication &amp; Cooperation</b></p> <p><b>Learning methods and mental technique</b></p> <p><b>Independency &amp; responsibility</b></p>

<ul style="list-style-type: none"> <li>• Leadership skills</li> <li>• Problem solving skills</li> <li>• Organising and Co-ordination skills</li> <li>• Critical thinkings</li> <li>• Decission Making</li> </ul>	Different type of Leadership styles and creative leadership			
Demonstration on different book keeping and accounting system.	<table border="1"> <tr> <td> <b>Management Inputs: Book keeping &amp; Accountancy, Working capital Management &amp; Assessment, Marketing Management</b> </td> </tr> <tr> <td>           Role of Support System Agencies         </td> </tr> <tr> <td> </td> </tr> </table>	<b>Management Inputs: Book keeping &amp; Accountancy, Working capital Management &amp; Assessment, Marketing Management</b>	Role of Support System Agencies	
<b>Management Inputs: Book keeping &amp; Accountancy, Working capital Management &amp; Assessment, Marketing Management</b>				
Role of Support System Agencies				

### Tools & Equipments (for the batch 20 trainees)

Sl. No.	Description on Items	Quantity
1.	A selection of Wolf Gardening Tools	01 sets
2.	Cleaning Tools and Treatments	01 nos
3.	Cutting and Pruning	10 sets
4.	Forks and Cultivators from Sneeboer	01 nos
5.	Garden Footwear - Wellingtons, Clogs and Shoes	05 nos
6.	Garden Storage, Protective Covers, Tarpaulins and Accessories	01 no
7.	Garden Tool Care and Maintenance	As required
8.	Gardening Gloves, Gauntlets, Aprons and Tool Bags	05 sets
9.	Gardening Hand Tools from Sneeboer	05 sets
10.	Plant Labels, labellers, Copper Labels and Tape	20 nos
11.	Plant Supports, Ties and Twine	05 nos
12.	Shears and Loppers, Hedge Trimmers	05 nos
13.	Spades and Bulb Planters from Sneeboer	01 nos
14.	Spades, Forks and Trowels	05 sets
15.	Tidying and Collecting, Paths and Sacks	05 sets
16.	Capillary Matting and Polythenes	01 no
17.	Garden Hose Connectors and Fittings	As required
18.	Garden Hose Pipes	As required
19.	Garden Water Butts and Accessories	As required
20.	Gardena Micro Drip and Spray Watering Systems	01 set
21.	Gravity Fed Drip Systems	02 sets
22.	Mains Fed Drip and Spray Watering Systems	01 set
23.	Self Watering Systems	01 no
24.	Tap Connectors and Tap Adaptors	01 no
25.	Water Guns, Nozzles and Lances	As required
26.	Water Pumps and Equipment	01 no

27.	Watering Cans and Garden Sprayers	01 no
28.	Watering Timers and Controllers	01 no
29.	Audio visual system	
	i) LCD Projector	01 no
	ii) Computer with latest configuration	01 no
	iii) Digital camera	01 no
	iv) LCD Screen/TV	01 no

List of members attended the Trade Committee Meeting for designing the course curriculum on **Agriculture and Allied Sector** under **Skill Development Initiative Scheme (SDIS)** based on **Modular Employable Skills (MES)** held on 25<sup>th</sup> and 26<sup>th</sup> November 2009 at Gramin ITC, Balasore

Shri S.D.Lahiri, Director, CSTARI., Salt Lake, Kolkata

SI No.	Name of the Member & Designation (In Block Letter) S/Shri	Representing Organization with full address	Signature
01	Swapna Mohapatra, Director	HDF Gramin ITC, Balasore	Chairman
02	R.K.Das Mohapatra, Horticulturist	Dept. of Horticulture, Mayurbhanj, Orissa	Member
03	Rabi Narayan Senapati, Soil Chemist	Soil Management Office, Mayurbhanj	Member
04	Nirmalendu Das Expert	Institute of Biofertiliser, Balasore	Member
05	Bijoy Kumar Das, Ex- Horticulturist	Govt. of Orissa	Member
06	Dr. Ranjoy Kumar Giri, Ex- Agro Officer	Soil Conservation Deptt., Govt. of Orissa	Member
07	Ranjan Kumar Kar, SMS (Forestry)	Krishi Vigyan Kendra, Balasore	Member
08	T.R.Mohanty, Senior Manager	Agro Industry, Orissa	Member
09	Dr. A.K.Sanigrihi, Scientist	DRDO, Balasore	Member
10	Dr. Sangram Keshari Swain, Programme Co-ordinator	Krishi Vigyan Kendra, Balasore	Member
11	K.M.Pattanaik, Retd. Addl. Director	DTET, Govt. of Orissa	Member
12	Er. N.R.Pattanaik, Principal	I.T.I., Balasore	Member
13	Dilip Ranjan Sarangi, Soil Chemist	Soil Management Office, Mayurbhanj	Member
14	Sudarsan Das, Trustee & Secretary	HDF <u>Gramin ITC, Balasore</u>	Member
15	Mrs. Sanghamitra Pattanaik, Senior Manager	Horticulture Deptt., Krishi Vigyan Kendra, Govt. of Orissa	Member

16	Dr. Dinabandhu Mohapatra, Chief Dev. Officer	Animal Husbandry Deptt., Govt. of Orissa	Member
17	Pradip Chandra Das, Retd. Asstt. Agricultural Officer	RIT, Bolangir	Member
18	Mrs. Manasi Bhol, Senior Manager	Horticulture Deptt., Krishi Vigyan Kendra, Govt. of Orissa	Member
19	Dr. Deep Choudhury, Retd. Chief Dev. Officer	Animal Husbandry Deptt., Govt. of Orissa	Member
20	Dr Keshab Chandra Panda, Principal	HDF, Gramin ITC, Balasore	Member
21	Dr. Dayanidhi Patra	People for animal	Member
22	Santosh Kumar Maharana, Training Officer	DDA. Baripoda	Member
23	Hrushikesh Mahanty, Instructor	HDF Gramin ITC, Balasore	Member
24	Bhupati Kumar Patra	HDF Gramin ITC, Balasore	Member
25	Debasish Mahapatra	HDF Gramin ITC, Balasore	Member
26	Radhagovinda Puhan	VS, Badasahi	Member
27	Bimbadhar Dwibedy,	Dairy Entrepreneur	Member
28	Rabindra Nath Patra, Coordinator	HDF Gramin ITC, Balasore	Member
29	Haribandhu Biswal, Deputy Director	Horticulture Dept. Govt. of Orissa	Member
30	Tushan Ranjan Mohanty	HDF Gramin ITC, Balasore	Member
31	Dilip ranjan Sarangi	HDF Gramin ITC, Balasore	Member
32	Kishore Chandra Sahu	Krishi Bigayn Kendra, Mayurbhanj	Member
33	Sachindra Dalabehera, Instructor	HDF Gramin ITC, Balasore	Member
34	G Giri, Deputy Director	RDAT, Salt Lake, Kolkata	Member
35	R.N.Manna, T.O.	CSTARI, Salt Lake, Kolkata	Member

**Course Curricula**  
Under  
**SKILL DEVELOPMENT INITIATIVE SCHEME (SDIS)**  
Based on  
**Modular Employable Skills (MES)**  
  
On



**Tea Plantation Assistant**  
**AGRICULTURE SECTOR**

**Designed in 2015**

**Government of India**  
**Ministry of Labour & Employment**  
**Directorate General of Employment & Training**

**GENERAL INFORMATION FOR THE MODULE**

### Tea Plantation Worker

<b>Name Of Sector</b>	<b>Agriculture</b>
<b>Name of Module</b>	<b>Tea plantation Assistant</b>
<b>MES Code</b>	<b>AGR 601</b>
<b>Competency as per N C O Code</b>	
<b>Duration of Course</b>	<b>400 hrs including 100 hrs of Soft &amp; Entrepreneurship Skills</b>
<b>Entry Qualification of Trainee</b>	Min. 5th Pass+ 14 yrs of age
<b>Unit Size ( No of trainees)</b>	20
<b>Power Norms</b>	02kW
<b>Space Norms (Workshop and Class Room)</b>	<p style="text-align: center;">Training will be conducted in the premise of Tea garden industry partner</p> <p style="text-align: center;">Practical training area: 1000 Sq mtr</p> <p style="text-align: center;">Class Room: 25 Sq mtr</p>
<b>Instructors Qualification</b>	<p style="text-align: center;">1. B. Sc in Agriculture domain with 1 year experience in Tea plantation <b>OR</b></p> <p style="text-align: center;">2. Diploma in Agriculture domain with 2 years experience in Tea plantation <b>OR</b></p> <p style="text-align: center;">3. NTC in Horticulture with 3 year experience in Tea plantation <b>OR</b></p> <p style="text-align: center;">4. Progressive farmers having Tea plantation expertise of at least 5 years in Tea cultivations as a supervisor (i.e. Sardar)</p>

<b>Objectives:</b> During the course, the trainee will be skilled in following areas of Tea plantation -			
<b>Plucking</b>	<b>Cultivation</b>	<b>Spraying</b>	<b>Manuring</b>
<b>Terminal Competency:</b>			
After completion of training the trainee will be able to work as a tea plantation worker.			

<b>Course Contents for Module: -Tea Plantation Assistant</b>	
<b>Practical Competencies</b>	<b>Underpinning Knowledge (Theory)</b>
<p><b><u>Nursery-Bed Preparation in Tea Plantation</u></b></p> <ul style="list-style-type: none"> <li>• Define a nursery bed.</li> <li>• Identify the types of nursery beds.</li> <li>• Prepare nursery beds.</li> <li>• Identify the climatic parameters w.r.t. the nursery bed.</li> <li>• List the life cycles of these pests and diseases and the sources of infection.</li> <li>• Maintain the material and equipment required for nursery bed preparation.</li> <li>• Read and understand instructions/ labels about the use of seeds, manure/fertilizer, irrigation equipment, etc.</li> <li>• Read and understand the hazards of use and contamination written on the labels of pesticides</li> <li>• Explain the practices of nursery preparation.</li> <li>• Explain the biotic and biotic stress factors of tea plantation (in terms of temperature fluctuations, dry spells,</li> </ul>	<ul style="list-style-type: none"> <li>• Defining a nursery bed</li> <li>• Types of nurseries <ul style="list-style-type: none"> <li>Vegetative Propagation</li> <li>Shade Nurseries</li> <li>Tea Seed</li> </ul> </li> <li>• Preparing a nursery bed <ul style="list-style-type: none"> <li>• Mix sand and soil (Preparation of Soil)</li> <li>• Prepare poly bags</li> <li>• Prepare Nucleus areas for obtaining VP (vegetative propagation) cuttings</li> <li>• Sow seeds or vegetative clonally propagation</li> <li>• Prepare cuttings for raising nursery</li> <li>• Harden the seedling or cuttings before taking to field for planting</li> </ul> </li> <li>• Climatic parameters-maximum and minimum temperatures, intensity and distribution of precipitation (rainfall), relative humidity</li> <li>• Pest and Diseases specific to a given agro climatic region</li> </ul>

<p>heavy downpour during critical stages etc.)</p>	<ul style="list-style-type: none"> <li>• Manu ring of nursery</li> <li>• Maintenance of equipment</li> </ul>
<p><b><u>Land preparation and Transplanting in Tea Plantation</u></b></p> <ul style="list-style-type: none"> <li>• List methods and components of land preparation.</li> <li>• Prepare the land based on the soil type.</li> <li>• List various methods of land preparation to maintain soil tilt.</li> </ul> <p>Sub Soil or Disc Plough Disco Harrow Leveler</p> <ul style="list-style-type: none"> <li>• Identify various farm machinery available and their utility to maintain soil tilt and health.</li> <li>• Clean the field for planting of new tea plants after rehabilitation by green crop.</li> <li>• Level the field through mechanical and manual means after ploughing and sub-soiling.</li> <li>• Construct drains.</li> <li>• Identify the layout of the field.</li> <li>• Prepare field for planting.</li> <li>• Explain space maintenance and transplanting and the influence on the crop yield.</li> </ul>	<ul style="list-style-type: none"> <li>• Land Preparation <ul style="list-style-type: none"> <li>• Clean the field</li> <li>• Level the field</li> <li>• Construct drains</li> <li>• Layout of the field</li> <li>• Prepare field for planting</li> </ul> </li> <li>• Seedling / Cutting Transplantation <ul style="list-style-type: none"> <li>• Put out stakes (markers) for planting pits</li> <li>• Making Pits for planting</li> <li>• Apply planting manure as per recommendation</li> <li>• Plant tea plants</li> <li>• Plant shade trees at suitable recommended distances</li> <li>• Perform mulching &amp; required field practices</li> <li>• Control weeds</li> <li>• Infilling vacancy</li> </ul> </li> </ul>
<p><b><u>Integrated Nutrient Management in Tea Plantation</u></b></p> <ul style="list-style-type: none"> <li>• Take soil as per the recommended sampling procedure from the field (by augur method).Take top and sub soil samples. Prepare samples as per procedure.</li> </ul>	<ul style="list-style-type: none"> <li>• Soil sampling and testing <ul style="list-style-type: none"> <li>• Sampling procedure</li> <li>• Dry the soil</li> <li>• Prepare the samples</li> </ul> </li> </ul>



<ul style="list-style-type: none"> <li>• Dry the soil and prepare samples as per procedure.</li> <li>• Pack and label the soil sample for submission to nearby soil testing laboratory for analysis.</li> <li>• Amend soil and correct for N, P, K, pH and carbon status as per need under management guidance &amp; recommendation.</li> <li>• Apply correctional nutrients to the soil as per recommended dosage and procedure before planting and during crop cultivation (if required).</li> <li>• Apply recommended dose of manure and fertilizers as ground application.</li> <li>• Soil types, their advantages and disadvantages in the light of tea cultivation with reference to the nutrient status.</li> <li>• Apply micro nutrients by foliar spray as per the recommendation.</li> </ul>	<ul style="list-style-type: none"> <li>• Pack and label the soil</li> <li>• Amend soil</li> <li>• Application of organic and inorganic fertilizers <ul style="list-style-type: none"> <li>• Apply Farm Yard Manure (FYM)</li> <li>• Enhancing soil nutrient</li> <li>• Recommended dose of manure &amp; fertilizer</li> <li>• Apply micro nutrients by foliar spray</li> </ul> </li> <li>• Weed control <ul style="list-style-type: none"> <li>• Removal of infected plant</li> <li>• Perform weeding manually</li> </ul> </li> </ul>
<p><b><u>CULTIVATION</u></b></p> <ul style="list-style-type: none"> <li>• Take up Weed control as per recommendation.</li> <li>• Identify methods and critical stages of weed control.</li> <li>• Remove rogue infected plant/ plant parts.</li> <li>• Perform weeding manually/ herbicides as per the recommendations and instructions.</li> <li>• Demonstrate appropriate methods of application of various fertilizers and micro nutrients.</li> </ul>	

<ul style="list-style-type: none"> <li>• Explain the concept of time of application in the crop life cycle.</li> <li>• Use various methods of plant growth regulators.</li> <li>• Read and understand instructions/ labels about the use of seeds, manure/ fertilizer, irrigation equipment, etc.</li> </ul>	
<p><b><u>Training and Pruning in Tea Plantation</u></b></p> <p><b>Young Tea Pruning :</b></p> <ul style="list-style-type: none"> <li>• Undertake centering (or de-centering as it commonly called) (this promotes the growth of auxiliary buds and lateral branches are formed).</li> <li>• Train growing branches by two stage tipping for further lateral branch formation, good spread and establishment of plucking surface.</li> <li>• Take up formative pruning for young tea plant as per pruning cycle.</li> <li>• Take up Table formation for bushes.</li> <li>• Bring planted area in the Pruning Cycle to keep the bushes continuously under vegetative stage.</li> </ul> <p><b>Mature Tea Pruning</b></p> <p>* Determining a Pruning Cycle: Actual Pruning of Cut Across, Deep Skiff and LOS Maintenance of Height of the Tea Bushes</p> <ul style="list-style-type: none"> <li>• Read and understand instructions/ labels about the use of seeds, manure/fertilizer, irrigation equipment, etc.</li> <li>• Maintain the material and equipment required for training and pruning</li> </ul>	<ul style="list-style-type: none"> <li>• Methods and procedure of training and pruning</li> </ul>

<p><b><u>Integrated Pest and Disease Management in Tea Plantation</u></b></p> <ul style="list-style-type: none"> <li>• Identify signs and symptoms of damage</li> <li>• Life Cycle of the pests</li> <li>• Identify natural enemies of the pests.</li> <li>• Identify signs and symptoms of different diseases.</li> <li>• Identify mode of transmission (implements, vectors, water, rain, wind)</li> <li>• Take up chemical and non-chemical approaches to pest and disease control (light traps, adhesive screens and manual collection).</li> <li>• Read and understand instructions / labels about the use of seeds, manure/fertilizer, pesticides irrigation equipment, etc.</li> <li>• Read and understand the hazards of use and contamination written on the labels of pesticides.</li> <li>• Maintain the material and equipment required for Integrated Pest and Disease Management and protective clothing.</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of pests and understanding behaviour <ul style="list-style-type: none"> <li>• Major pests and diseases and their behavior</li> </ul> </li> <li>• Identification of diseases <ul style="list-style-type: none"> <li>• Operations (cultural operations) and their impact on pest incidence</li> </ul> </li> <li>• Preventive and curative methods <ul style="list-style-type: none"> <li>• Preparing various bio pesticides</li> <li>• Record keeping system</li> <li>• Safety measures and first aid</li> <li>• Handling tools and equipment</li> </ul> </li> </ul>
<p><b><u>Irrigation in Tea Plantation</u></b></p> <ul style="list-style-type: none"> <li>• Irrigate based on the soil type and land slope and as per the recommendations/instruction of the supervisor.</li> <li>• Maintain drainage system by regular cleaning and weeding.</li> <li>• Interaction effects of the soil type, level of the land and water availability on the crop growth and its yield.</li> </ul>	<ul style="list-style-type: none"> <li>• Irrigation <ul style="list-style-type: none"> <li>• Soil type based irrigation</li> <li>• Timing &amp; method of irrigation</li> </ul> </li> <li>• Drainage <ul style="list-style-type: none"> <li>• Maintenance of drainage system</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>• Identify timing and method of irrigation and drainage appropriate for a given soil type and climatic condition.</li> <li>• Maintain the material and equipment required for irrigation.</li> </ul>	
<p><b><u>Harvesting (Plucking)</u></b></p> <ul style="list-style-type: none"> <li>• Identify ideal stage of harvesting.</li> <li>• Undertake methods to avoid losses during harvest.</li> <li>• Perform leaf plucking at appropriate stage.</li> <li>• Perform periodical harvesting.</li> <li>• List steps involved in plucking of leaves manually.</li> <li>• Tipping heights for different prunes.</li> <li>• Fine Leaf count of Green leaf to assess quality of green leaf plucked.</li> <li>• List steps involved in plucking of leaves using plucking machine.</li> <li>• List the do's and don'ts w.r.t plucking of leaves.</li> <li>• Maintain the material and equipment required for harvesting and post harvesting.</li> </ul>	<ul style="list-style-type: none"> <li>• Modes of harvesting- manual &amp; machine based</li> <li>• Leaf plucking</li> <li>• Periodical harvesting</li> </ul>
<p><b><u>Health &amp; Safety at the workplace</u></b></p> <ul style="list-style-type: none"> <li>• Undertake basic safety checks before operation of all machinery and vehicles and hazards are reported to the appropriate supervisor.</li> <li>• Work for which protective clothing or equipment is required is identified and the appropriate protective clothing or equipment is used in performing these duties in accordance with workplace</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain a clean and efficient workplace <ul style="list-style-type: none"> <li>• Basic safety checks for machinery</li> <li>• Protective clothing/ equipment</li> <li>• Hazards of use- equipment/ fertilizers &amp; chemicals</li> <li>• Manual handling</li> <li>• Disposal of waste</li> </ul> </li> </ul>

<p>policy.</p> <ul style="list-style-type: none"> <li>• Read and understand the hazards of use and contamination mentioned on the labels of pesticides/fumigants etc.</li> <li>• Prior to performing manual handling jobs, risk is assessed and work is carried out according to currently recommended safe practice.</li> <li>• Use equipment and materials safely and correctly and return the same to designated storage when not in use.</li> <li>• Antidotes for different chemicals</li> <li>• Dispose off waste safely and correctly in a designated area.</li> <li>• Risks to bystanders are recognized and action is taken to reduce risk associated with jobs in the workplace.</li> <li>• Perform your work in a manner which minimizes environmental damage.</li> <li>• All procedures and work instructions for controlling risk are followed closely.</li> <li>• Report any accidents, incidents or problems without delay to an appropriate person and take necessary immediate action to reduce further danger.</li> <li>• Follow procedures for dealing with accidents, fires and emergencies, including communicating location and directions to emergency.</li> <li>• Follow emergency procedures to company standards and workplace requirements.</li> <li>• Use Emergency equipment in accordance with manufacturers'</li> </ul>	<ul style="list-style-type: none"> <li>• Precautions at workplace</li> <li>• Prevention of accidents</li> <li>• Reporting</li> <li>• Render appropriate emergency procedures <ul style="list-style-type: none"> <li>• Emergency procedures-accidents, fires, etc.</li> <li>• Standards and workplace requirements</li> <li>• First aid</li> <li>• Waste disposal- medical, organic etc.</li> <li>• Reporting</li> </ul> </li> </ul>
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<p>specifications and workplace requirements.</p> <ul style="list-style-type: none"> <li>• Provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques.</li> <li>• Recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate.</li> <li>• Dispose off waste in accordance with workplace requirements.</li> <li>• Report details of first aid administered in accordance with workplace procedures.</li> </ul>	
<p><b>Ancillary topic</b></p> <ul style="list-style-type: none"> <li>• Cultivation of rubber, pepper and lemon grass</li> </ul>	<ul style="list-style-type: none"> <li>• Ancillary Plantation in tea garden and its utility.</li> </ul>

#### List of Tools & Equipment for Batch 20 Nos.(Tea Plantation Assistant)

Sl. No.	Name of Tool/ Equipment	Quantity
1.	Computer with latest configuration	1 No
2.	LCD Projector	1 No
3.	Projection Screen	1 No
4.	White Boards	1 No
5.	Flip Chart	20 Nos.
6.	Flip Chart Holder	1 No.
7.	Markers	5 Nos.
8.	Sickle	20 Nos
9.	Hand-held knife	20 Nos
10.	Augers for Sampling of top and sub soil	15 Nos.
11.	Respirator	20 Nos

12.	Spraying Machine	4 Nos.
13.	A set of tea plants in the field	50 Nos.
14.	Khurpi	20 Nos
15.	Shovel	20 Nos
16.	Spraying Nozzles	4 Nos. each type
17.	Pruning shears, sharp knife	20 Nos
18.	Mechanized Sprayer	1 No.

### **CONSUMABLES**

<b>Sl. No.</b>	<b>Name of Tool/ Equipment</b>	<b>Quantity</b>
1.	Polythene bags for storing soil (both clean and dirty ones)	As required
2.	Paper chits	As required
3.	Pencils	As required
4.	A thread/stapler	As required
5.	Long rubber Gloves	20 Nos
6.	Boots	20 Nos
7.	Hats/Caps/Helmets	20 Nos
8.	Face mask/Face shield	20 Nos
9.	Waterproof aprons	20 Nos
10.	Fertilizers N P N K	10 Kgs of each
11.	Stirring rod	1 No.
12.	Polythene bags/sleeves	100 Nos.
13.	Manure	10 Kgs.

### LIST OF TRADE COMMITTEE MEMBERS

List of members attended the Trade Committee Meeting for designing the course curriculum under **Skill Development Initiative Skill (SDIS)** based on **Modular Skills (MES)** on Tea Plantation assistant under Agriculture Sector held at Jardine Henderson Limited, 4-Clive Row, Kolkata-700 069 on 11.03.2015

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