

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

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)'

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

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

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

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

Duration of the Programmes

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.

Pathways to acquire Qualification:

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

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

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

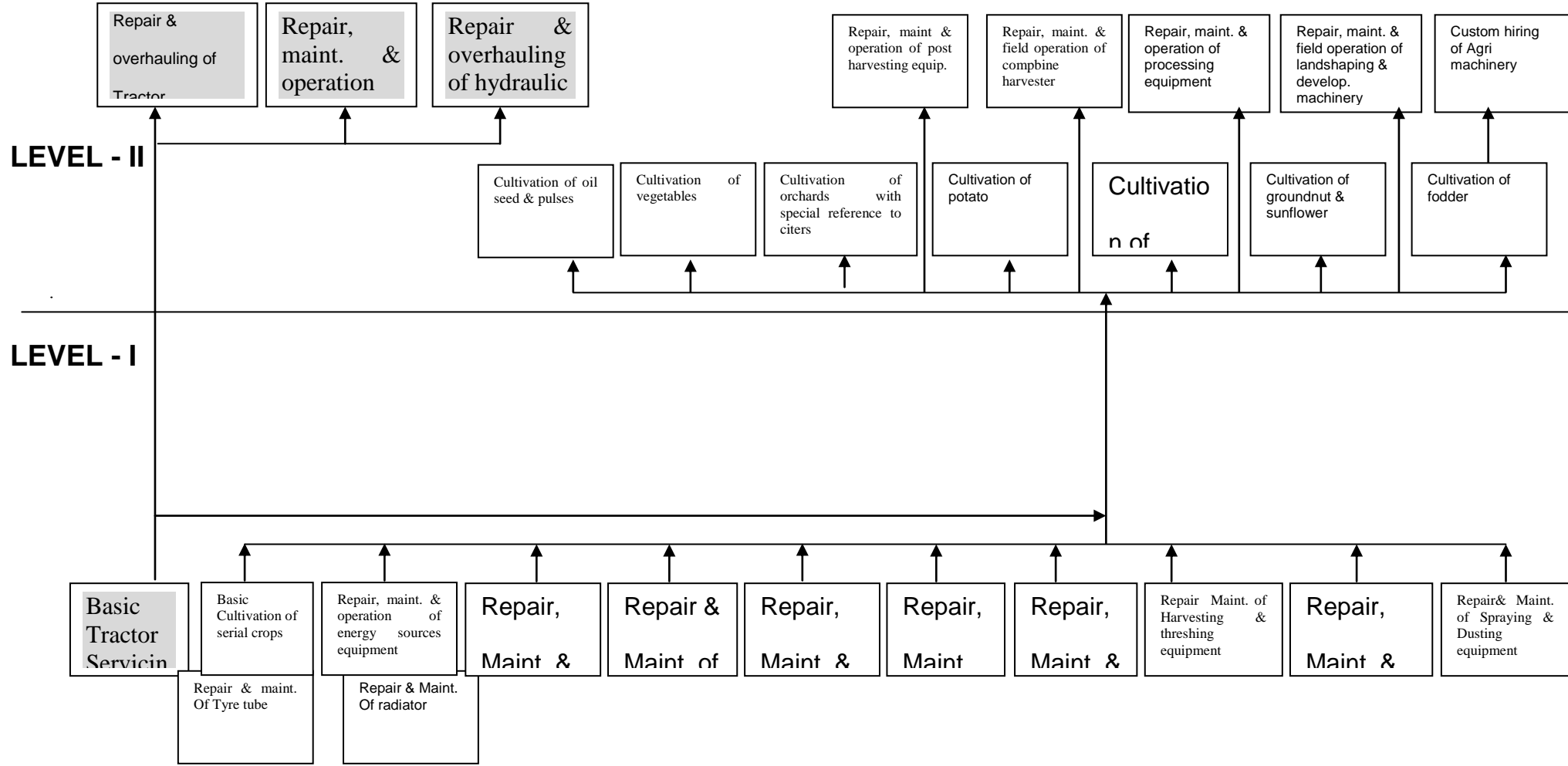
DGE&T will appoint assessing bodies to assess the competencies of the trained persons. The assessing body will be an independent agency, which will not be involved in conducting the training programmes. This, in turn, will ensure quality of training and credibility of the scheme. Keeping in view the 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

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

COURSE MATRIX IN AGRICULTURE SECTOR

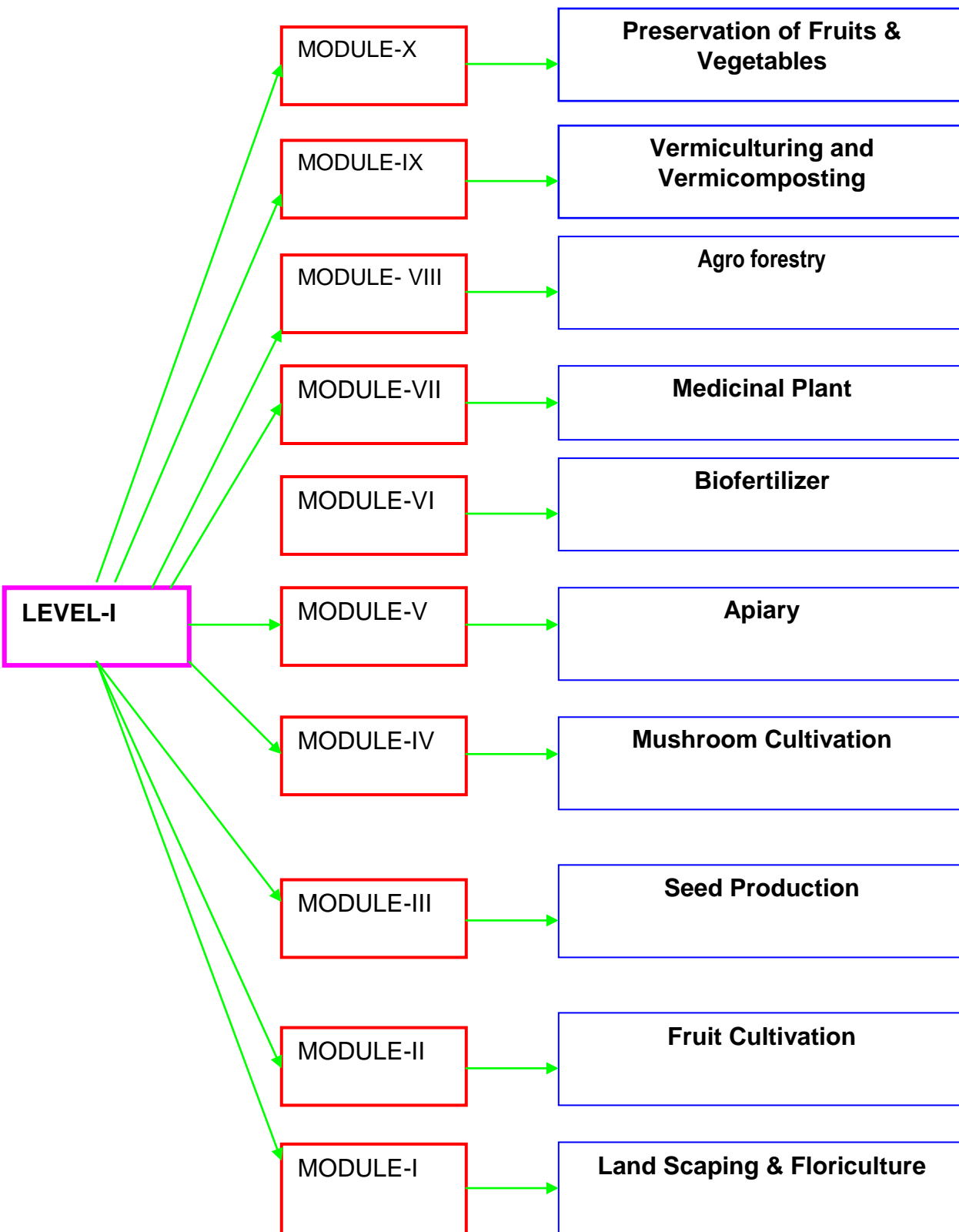
Course Outline / Pathway



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 of Tyres and Tubes.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR112
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
- 5. Terminal competency** : Successful candidate would be able to carry out Repair & Maintenance of Tyres and Tubes.
- 6. Duration** : 150 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Identify the component of wheel . ➤ Practice in removal and re-fitting of wheel from vehicle/tractor. ➤ Practice in dismantle and assemble the Tyre and Tubes from Rim. ➤ Check Tyre for wear and tear . ➤ Check tube for leaks. ➤ Repair cut of tyre by vulcanizing method. ➤ Repair tube by hot patch. ➤ Repair tube by cold patch. ➤ Repair tube by vulcanizing. ➤ Tyre tube inflation for correct pressure. ➤ Tyre- rotation. ➤ Wheel nut tightening sequence. ➤ Adjust wheel track front and rear. 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions observed in workshop. ➤ Study of wheel and its parts. ➤ Description of tyre and tube. ➤ Types of Tyres and their size. ➤ Use of Tyres and Tubes. ➤ Advantage and disadvantages of pneumatic tyres. ➤ Method of repairing of tyres and tubes. ➤ Importance of tyres inflation. ➤ Methods of tyres rotation. ➤ Methods of wheel nut tightening sequence. ➤ Methods of adjustment of wheel track. ➤ Reasons for general tyre defects. ➤ Periodical maintenance . ➤ Trouble shooting .

TOOLS & EQUIPMENTS

S.No.	Item
1.	Wheel type tractor
2.	Steel rule 15 cm. English and metric
3.	Screw driver 20 cm.x 9mm blade
4.	Pliers combination 20 cm
5.	Vice grip pliers.
6.	Hand file 20 cm rasp cut
7.	Steel tool box with lock & key(folding type) size 400x200x150mm
8.	Allen Key set of 12 pieces (2mm to 14 mm)
9.	Philips Screw Driver Type set of 5 pieces 100 mm to 300 mm 04 Sets 34 Spanner, ring offset set
10.	Scriber 15 cm with scribing block universal
11.	Centre punch 10 mm dia x 100 mm
12.	Chisel cold flat 20 mm
13.	Hacksaw frame adjustable for 30 cm blade
14.	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.
15.	Mallets (Wooden/plastic)
16.	Cross peen Hammer 1 kg
17.	Ball peen Hammer 0.5 Kg.
18.	Sledge Hammer 3.5-5 kg
19.	Spanner D E set of 12 pieces (6mm to 32 mm)
20.	Ring spanner set of 12 pieces (6mm to 32 mm.)
21.	Spanner, adjustable 20 cm.
22.	Spanner adjustable (pipe wrench) 350 mm
23.	Spanners socket of 8 with handles, T bar and ratchet
24.	Screw jack 3 ton capacity double lift
25.	Hydraulic Jack 5 ton capacity with trolley
26.	Horses and wheel choke
27.	Cleaning trays 45 x 30 cm.
28.	Torque wrench set of 3 Nos.
29.	Stud remover.
30.	'V' Block 75 x 38 mm pair with Clamps.
31.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
32.	Tyre remover pneumatic type
33.	Tyre lever
34.	Tyre vulcanizing machine
35.	Tube vulcanizing machine
36.	Hot Patch Clamp
37.	Valve die
38.	Air compressor
39.	Air pressure guage Wall type & Hand type
40.	Tube checking water tank
41.	Computerize wheel balancing Machine
42.	Rim Straitening Machine

Level – I

- 1. Module name** : **Repair, maintenance & field operation of Tillage Equipments.**
- 2. Sector** : **AGRICULTURAL SECTOR**
- 3. Code** : **AGR104**
- 4. Entry Qualification** : **Minimum 5th 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 :

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

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** : Repair, maintenance & field operation of Soil Farming Equipments.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR106
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
- 5. Terminal competency** : Successful candidate would be able to carry out repair, maintenance & field operation of Soil Forming Equipments.
- 6. Duration** : 120 hours

7. COURSE CONTENT :

➤ Practical Competencies	➤ Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Identify different components of different equipments such as leveler, scraper, ridger, bund maker, ditcher bed-former etc. ➤ Dismantle and assemble the leveler, scraper, ridger, bund maker, ditcher lazer leveler and bed former . ➤ Repair the Soil Forming Equipments. ➤ Workshop adjustments of Soil Forming Equipments. ➤ Field adjustments of Soil Forming Equipments. ➤ Methods of field operation of Soil Forming Equipments. ➤ Care and maintenance of Soil Forming Equipments. 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions observed in workshop & field. ➤ Identify different components of leveler, scraper, ridger, bund maker, ditcher lazer leveler and bed former . ➤ Working Principal and Constructional details of Soil Forming Equipments. ➤ Adjustments of Soil Forming Equipments. ➤ Methods of field operation of Soil Forming Equipments. ➤ Recommended speed for Soil Forming Equipments. ➤ Care and maintenance of Soil Forming Equipments. ➤ Storage of Soil Forming Equipments in off season.

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.	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.	Leveler
52.	Scraper – Angle Blade Scraper
53.	Laser Leveler
54.	Ridger
55.	Bund Maker
56.	Ditcher
57.	Post hole digger
58.	Bed Former

Level – I

- 1. Module name** : Repair, maintenance & field operation of Seed drills.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR107
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
- 5. Terminal competency** : Successful candidate would be able to carry out repair maintenance & field operation of Seed drills & Conservation-sowing Machinery.
- 6. Duration** : 150 hours

7. COURSE CONTENTS :

➤ Practical Competencies	➤ Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Identify different components of Seed Drills, Zero till drills and strip till drills . ➤ Dismantle and assemble the Seed drills. ➤ Check & repair the drills. ➤ Workshop adjustments of drills. ➤ Workshop calibration of Drills. ➤ Field adjustments of drills. ➤ Field calibration of Drills. ➤ Methods of field operation of Zero-till and Strip till drill . ➤ Repair of furrow openers . ➤ Care and maintenance . 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions observed in workshop & field. ➤ Types of seed drills . ➤ Working Principal and Constructional details of seed drills & Conservation drills. ➤ Types of meeting devise . ➤ Types of furrow openers and strip tillage devices. ➤ Method of calibration of Seed Drills. ➤ Adjustments of Seed Drills & strip tillage drills. ➤ Methods of field operation of different Seed Drills. ➤ Recommended speed for drills. ➤ Care and maintenance of drills . ➤ Storage of drills in off season .

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.	Electric arc welding set portable
24.	Taps and Dies complete set in a box (metric) with handle.
25.	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.
26.	Copper Hammer
27.	Ball peen Hammer 0.5 Kg.
28.	Cross peen Hammer 1 kg
29.	Spanner D E set of 12 pieces (6mm to 32 mm)
30.	Ring spanner set of 12 pieces (6mm to 32 mm.)
31.	Spanner, adjustable 20 cm.
32.	Spanner adjustable (pipe wrench) 350 mm
33.	Spanners socket of 8 with handles, T bar and ratchet
34.	Horses
35.	Screw jack 1 ton capacity double lift
36.	Oil can 0.5-liter cap
37.	Weight balance with weight
38.	Grease Gun Hand/Pneumatic
39.	Measuring tape
40.	Cleaning trays 45 x 30 cm.
41.	Stud remover.
42.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
43.	Pullers screw powered 2mm with bearing puller attachment.
44.	Seed Drill for small seeds
45.	Seed-cum-fertilizer drill
46.	Zero till seed drill
47.	Strip till drill
48.	Tractor PTO operated 9 row direct sowing happy seeder

Level – I

- 1. Module name** : Repair, maintenance & field operation of Planters & Trans Planter.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR108
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
- 5. Terminal competency** : Successful candidate would be able to carry out repair maintenance & field operation of Planters.
- 6. Duration** : 150 hours

7. COURSE CONTENT :

➤ Practical Competencies	➤ Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Identify different components of row-crop, Potato Planter, Sugarcane Planters, Paddy and Vegetable trans planter. ➤ Dismantle and assemble the Planters. ➤ Check & repair the Planters. ➤ Workshop adjustments of Maize , Cotton, Ground nut, Potato and Sugar cane Planters. ➤ Set plant to plant spacing in row-crop, potato planter, sugarcane planter etc. ➤ Calibration of Maize , Cotton, Ground nut, Potato and Sugar cane Planters. ➤ Adjustment of row marker . ➤ Field adjustments of different Planters. ➤ Field operation of paddy/Vegetable transplanter. ➤ Field operation of ridge planter for winter maize. ➤ Field operation of till planter. ➤ Field operation of sugarcane cutter planter. ➤ Methods of field operation of Maize , Cotton, Ground nut, Potato Planters. ➤ Minor Repair of soil working component of planter and fertilizer applicator. ➤ Care and maintenance . 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions observed in workshop & field. ➤ Types of Planters/ trans planter. ➤ Working Principal and Constructional details of Planters/ trans planter. ➤ Types of meeting devise . ➤ Types of furrow openers ➤ Method of calibration of Planters (Workshop and field.) ➤ Adjustments of row marker. ➤ Methods of power transmission in Planters Method of field operation of Planters (Sugarcane cutter planters, Ridge planter, Zero till and Groundnut planters). ➤ Recommended row spacing , seed spacing and speed for Planters. ➤ Care and maintenance of Planters. ➤ Precaution , in handling fertilizers. ➤ Storage of Planters in off season .

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.	Electric arc welding set portable
24.	Taps and Dies complete set in a box (metric) with handle.
25.	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.
26.	Copper Hammer
27.	Ball peen Hammer 0.5 Kg.
28.	Cross peen Hammer 1 kg
29.	Spanner D E set of 12 pieces (6mm to 32 mm)
30.	Ring spanner set of 12 pieces (6mm to 32 mm.)
31.	Spanner, adjustable 20 cm.
32.	Spanner adjustable (pipe wrench) 350 mm
33.	Spanners socket of 8 with handles, T bar and ratchet
34.	Horses
35.	Screw jack 1 ton capacity double lift
36.	Oil can 0.5-liter cap
37.	Weight balance with weight
38.	Grease Gun Hand/Pneumatic
39.	Measuring tape
40.	Cleaning trays 45 x 30 cm.
41.	Stud remover.
42.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
43.	Pullers screw powered 2mm with bearing puller attachment.
44.	Cotton, Maze & Pea Planter
45.	Ground nut, Soybean planter
46.	Potato planter (semi & automatic)
47.	Sugar cane cutter planter
48.	Sunflower planter
49.	Paddy transplanter
50.	Vegetable Planter
51.	Tractor operated bed former-cum-planter

Level – I

- 1. Module name** : Repair, maintenance & field operation of Root Harvesting Equipments.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR110
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
- 5. Terminal competency** : Successful candidate would be able to carry out repair maintenance & field operation of Root Harvesting Equipments.
- 6. Duration** : 120 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Identify different components of potato digger, groundnut and onion digger. ➤ Practice in dismantle and assemble the of potato digger, groundnut and onion digger. ➤ Check & repair the of potato digger, groundnut and onion digger. ➤ Repair and replace the components of of potato digger, groundnut and onion digger. ➤ Workshop adjustments. ➤ Operation of of potato digger, groundnut and onion digger. ➤ Field adjustment of of potato digger, groundnut and onion digger. ➤ Faults and remedies . ➤ Precaution while handling in the filed. 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions and first aid ➤ Purpose of potato digger, groundnut and onion digger. ➤ Types of potato digger, groundnut and onion digger. ➤ Working Principal and Constructional details of potato digger, groundnut and onion digger. ➤ Prime-mover and driving system. ➤ Workshop adjustment. ➤ Method of operation. ➤ Recommended Speed for potato digger, groundnut and onion digger. ➤ Types of losses ➤ Care and maintenance. ➤ Trouble shooting and remedies .

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.	Pliers round 15 cm
6.	Pliers flat nose 15 cm
7.	Pliers side cutting 15 cm
8.	Vice grip pliers.
9.	Circlip pliers Expanding and contracting type 15 cm and 20 cm each 8 sets.
10.	Hand file 20 cm. Second cut half round
11.	Hand file 30 cm bastard flat
12.	Hand file 30 cm bastard round
13.	Feeler gauge 20 blades (metric)
14.	Steel tool box with lock & key(folding type) size 400x200x150mm
15.	Allen Key set of 12 pieces (2mm to 14 mm)
16.	Philips Screw Driver Type set of 5 pieces 100 mm to 300 mm 04 Sets 34 Spanner, ring offset set
17.	Engineer's square 15 cm blade
18.	Divider spring joint 15 cm.
19.	Scriber 15 cm with scribing block universal
20.	Pick punch 15 cm 2nos.
21.	Drift punch copper 15 cm
22.	Centre punch 10 mm dia x 100 mm
23.	Chisel cold flat 20 mm
24.	Chisels Cross cut 200mm x 6 mm
25.	Hacksaw frame adjustable for 30 cm blade
26.	Drill Twist (assorted)
27.	Drill electric hand 6-12 mm
28.	Electric pedestal grinder with two wheel
29.	Electric Arc Welding Set
30.	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.
31.	Tachometer – to read up to 5000 rpm
32.	Mallets (Wooden/plastic)
33.	Ball peen Hammer 0.5 Kg.
34.	Cross peen Hammer 1 kg
35.	Spanner D E set of 12 pieces (6mm to 32 mm)
36.	Ring spanner set of 12 pieces (6mm to 32 mm.)
37.	Spanner, adjustable 20 cm.
38.	Spanner adjustable (pipe wrench) 350 mm
39.	Spanners socket of 8 with handles, T bar and ratchet
40.	Screw jack 1ton 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.	Triple leg grip puller with bearings attachment screw/hydraulic powered max. Spread 80,160,50,450 mm.
46.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
47.	Pulley puller disc type for pulley
48.	Ground nut digger
49.	Potato digger
50.	Onion digger

LEVEL – I

- 1. Module name** : **Basic Tractor servicing.**
- 2. Sector** : **AGRICULTURAL SECTOR**
- 3. Code** ; **AGR101**
- 4. Entry Qualification** : Minimum 5th 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"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Practice 5 S techniques. ➤ Identify / familiarize with tools and equipments. ➤ Wash before and after repair. ➤ Check replenish/top up lubricating oil, brake fluid, engine coolant, battery electrolyte transmission/hydraulic oil. ➤ Clean/replace air cleaner filter, oil filter and fuel filters. ➤ Apply grease to parts throw nipple . ➤ Checks electrical system in petrol engine clean check & adjust spark plug. ➤ Check & adjust fuel injection timing. ➤ Bleeding of fuel (diesel) supply system. ➤ Adjust clutch & brake paddle play. ➤ Charging of battery. ➤ Check tyre pressure and inflate. ➤ Rotate tyres. 	<ul style="list-style-type: none"> ➤ General health & safety precautions to be observed in workshop/field. ➤ Overview of 5S techniques (short set in order, shine, standardize is sustain). ➤ Advantages in implementation of 5S. ➤ Nomenclature of different parts of tractor. ➤ Working of two/four stroke petrol/diesel engine. ➤ Difference between two stroke & four stroke petrol and diesel engine. ➤ Types of lubrication system. ➤ Types cooling system. ➤ Fuel supply layout of petrol/diesel engine. ➤ Layout of greasing points. ➤ Brief introduction to ignition in petrol engine, ignition system circuit . ➤ Introduction to fuel supply system in diesel engine. ➤ Layout of components of fuel supply system in diesel engine. ➤ Introduction to clutch, Gear box, differential, power converter and power take off. ➤ Types of brakes and steering systems. ➤ Maintenance of lead acid battery. ➤ Tyre size and tyre rotation. ➤ Reasons for general tyre defects. ➤ Care and maintenance.

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 Irrigation Equipment.**
- 2. Sector** : **AGRICULTURAL SECTOR**
- 3. Code** : **AGR105**
- 4. Entry Qualification** : **Minimum 5th standard and 14 years of age**
- 5. Terminal competency** : **Successful candidate would be able to carry out repair maintenance & field operation of Irrigation Equipment..**
- 6. Duration** : **150 hours**

7. COURSE CONTENT :

➤ Practical Competencies	➤ Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Identify different components of Centrifugal pumps and submersible pumps. ➤ Dismantle and assemble the Centrifugal and submersible pumps. ➤ Repair the Centrifugal pumps and submersible pumps. ➤ Repair the sprinkler and drip type equipments. ➤ Repair valves and hydrants. ➤ Workshop adjustments of Centrifugal pumps and submersible pumps. ➤ Adjust sprinkler and dripper . ➤ Adjust of Centrifugal pumps and submersible pumps. ➤ Installation of Centrifugal pumps and submersible pumps. ➤ Installation of sprinkler and dripper system . ➤ Field operation of Centrifugal pumps and submersible pumps. ➤ Field operation of sprinkler and dripper nozzle system . ➤ Faults and remedies of pumps and Irrigation equipments. 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions observed in workshop & field. ➤ Source of Irrigation System. ➤ Method of Irrigation System. Types of Irrigation channel . ➤ Common types of pumps. ➤ Working Principal and Constructional details of pumps.. ➤ Types of Centrifugal pumps . ➤ Working Principal and Constructional details of submersible pumps. ➤ Installation of Centrifugal pumps and submersible pumps. ➤ Installation of sprinkler and drip system. ➤ Adjustments of Centrifugal pumps and submersible pump. ➤ Measuring devise for irrigation water. ➤ Pumps selection and common prime-mover. ➤ Selection and Installation of drive to pumps . ➤ Care and maintenance of pumps. ➤ Trouble shooting and remedies ➤ Common accidents and their prevention. ➤ Gas problems in pits.

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.	Ball peen Hammer 0.5 Kg.
26.	Cross peen Hammer 1 kg
27.	Spanner D E set of 12 pieces (6mm to 32 mm)
28.	Ring spanner set of 12 pieces (6mm to 32 mm.)
29.	Spanner, adjustable 20 cm.
30.	Spanner adjustable (pipe wrench) 350 mm
31.	Spanners socket of 8 with handles, T bar and ratchet
32.	Horses
33.	Oil can 0.5-liter cap
34.	Grease Gun Hand/Pneumatic
35.	Measuring tape
36.	Cleaning trays 45 x 30 cm.
37.	Stud remover.
38.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
39.	Pullers screw powered 2mm with bearing puller attachment.
40.	Centrifugal pump
41.	Diffuser type pump (single stage/multi stage)
42.	Submersible pump
43.	Sprinkler system set complete for one hectare
44.	Dripper system set complete for hundred plants & 1000 m ² lawn/field

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 5th 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 :

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

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** : Repair, maintenance & field operation of Harvesting and Threshing Equipments.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR109
- 4. Entry Qualification** : Minimum 5th standard and 14 years of age
- 5. Terminal competency** : Successful candidate would be able to carry out repair maintenance & field operation of Harvesting and Threshing Equipments.
- 6. Duration** : 240 hours

7. COURSE CONTENT :

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Identify different system & components of Reaper, Reaper binder, threshers and mowers , fodder Harvester and choppers. ➤ Practice in dismantle and assemble the Reaper, Reaper binder choppers and threshers . ➤ Check & repair the Cutter bar, feeder and thresher cylinders, straw walker, sieves, blower and augers. ➤ Repair and Replace the components of Reaper, Reaper binder and threshers . ➤ Adjust the Cutter bar and feeder of Reaper and Reaper binder . ➤ Adjust thresher cylinder, concave sieves, blower and augers for wheat and paddy . ➤ Adjust thresher cylinder concave sieves, blower and augers for maize, sunflower thresher. ➤ Adjust axial flow groundnut thresher. ➤ Adjust axial flow vegetables, seed extracting machine/thresher. ➤ Check drive mechanism of Reaper, Reaper binder, choppers and threshers . ➤ Workshop adjustment of Reaper, Reaper binder, choppers and threshers . ➤ Field operation of Reaper and Reaper binder. ➤ Field operation of wheat, paddy, maize, sunflower, groundnut thresher. ➤ Adjust cutter bar height Reaper and Reaper winder . ➤ Adjust thresher cylinder speed according to crop condition. ➤ Adjust grain sieves and blower rpm. ➤ Faults and remedies of Reaper, Reaper binder and threshers .. ➤ Precaution while handling Reaper, Reaper binder and threshers . ➤ Reaper, Reaper binder and threshers . 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions and first aid ➤ Purpose of Reaper, Reaper binder , threshers and choppers. ➤ Advantages & disadvantage. ➤ Functional systems of Reaper, choppers and Reaper binder. ➤ Functional systems of Threshers. ➤ Working Principal and Constructional details of Reaper and Reaper Winder. ➤ Working Principal and Constructional details of Thresher. ➤ Types of Threshers. ➤ Prime-mover and driving system. ➤ Workshop adjustment for wheat & paddy. ➤ Method of field operation of Reaper and Reaper Binder. ➤ Field adjustments of Reaper , Reaper Binder and choppers. ➤ Field operation of thresher. ➤ Flow path material of Thresher. ➤ Field adjustment of thresher. ➤ Recommended speeds for different crops for reaper and reaper binder. ➤ Types of losses, their causes & remedies. ➤ Care and maintenance of Reaper , Reaper binder and threshers. ➤ Trouble shooting and remedies ➤ Common accidents and their prevention. ➤ Precautions while using Reaper , Reaper Binder threshers and choppers. ➤ Storage during off season. ➤ Custom hiring of Reaper , Reaper Winder and threshers.

TOOLS AND 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.	Pliers round 15 cm
6.	Pliers flat nose 15 cm
7.	Pliers side cutting 15 cm
8.	Vice grip pliers.
9.	Circlip pliers Expanding and contracting type 15 cm and 20 cm each 8 sets.
10.	Hand file 20 cm. Second cut half round
11.	Hand file 20 cm. Smooth triangular
12.	Hand file 30 cm bastard flat
13.	Hand file 30 cm bastard round
14.	Feeler gauge 20 blades (metric)
15.	Steel tool box with lock & key(folding type) size 400x200x150mm
16.	Allen Key set of 12 pieces (2mm to 14 mm)
17.	Philips Screw Driver Type set of 5 pieces 100 mm to 300 mm 04 Sets 34 Spanner, ring offset set
18.	Engineer's square 15 cm blade
19.	Divider spring joint 15 cm.
20.	Scriber 15 cm with scribing block universal
21.	Pick punch 15 cm 2nos.
22.	Drift punch copper 15 cm
23.	Centre punch 10 mm dia x 100 mm
24.	Chisel cold flat 20 mm
25.	Chisels Cross cut 200mm x 6 mm
26.	Hacksaw frame adjustable for 30 cm blade
27.	Hand vice 37 mm
28.	Drill Twist (assorted)
29.	Drill electric hand 6-12 mm
30.	Washing unit
31.	Air Compressor
32.	Electric pedestal grinder with two wheel
33.	Electric arc welding set portable
34.	Taps and Dies complete set in a box (metric) with handle.
35.	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.
36.	Tachometer – to read up to 5000 rpm
37.	Mallets (Wooden/plastic)
38.	Ball peen Hammer 0.5 Kg.
39.	Cross peen Hammer 1 kg
40.	Spanner D E set of 12 pieces (6mm to 32 mm)
41.	Ring spanner set of 12 pieces (6mm to 32 mm.)
42.	Spanner, adjustable 20 cm.
43.	Spanner adjustable (pipe wrench) 350 mm
44.	Spanners socket of 8 with handles, T bar and ratchet
45.	Horses and wheel choke
46.	Screw jack 4 ton capacity double lift
47.	Hydraulic jack 3 ton capacity with trolley
48.	Oil can 0.5-liter cap
49.	Grease Gun Hand/Pneumatic
50.	Cleaning trays 45 x 30 cm.
51.	Torque wrench set of 3 Nos.
52.	Stud remover.
53.	'V' Block 75 x 38 mm pair with Clamps.
54.	Surface plate 60x60 cm
55.	Triple leg grip puller with bearings attachment screw/hydraulic powered max. Spread 80,160,50,450 mm.
56.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
57.	Pullers screw powered 2mm with bearing puller attachment.
58.	Bearing puller screw powered/hydraulic powered with attachments
59.	Pulley puller plate type for thresher
60.	Pulley puller disc type for pulley
61.	Tyre pressure gauge
62.	Reaper, Reaper binder
63.	Straw reaper
64.	Thresher for wheat & paddy
65.	Thresher for maze
66.	Multipurpose thresher
67.	Thresher for sunflower
68.	Axial flow groundnut thresher
69.	Axial flow vegetable thresher
70.	Mover
71.	Fodder harvester

LEVEL – I

- 1. Module name** : **Basic Cultivation for Cereal Crops.**
- 2. Sector** : **AGRICULTURAL SECTOR**
- 3. Code** : **AGR102**
- 4. Entry Qualification** : Minimum 5th 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:

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

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)

Level - I

1. **Module name** : **Repair & Maintenance of Radiator.**
2. **Sector** : **AGRICUTURAL SECTOR**
3. **Code** : **AGR113**
4. **Entry Qualification** : Minimum 5th standard passed and 14 years of age
5. **Terminal competency** : Successful candidate would be able to carry out Repair & Maintenance of Radiator and
6. **Duration** : 120 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none">➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety.➤ Identify the parts of Radiator .➤ Practice in removal and re-fitting of Radiator from vehicle/tractor.➤ Practice in dismantle and assemble the Radiator tank.➤ Check upper and lower tank.➤ Check Radiator tube for leaks.➤ Repair leaks from Radiator tubes by blending tubes.➤ Repair Radiator upper and lower tank by brazing.➤ Check Radiator in Radiator tank➤ Fit Radiator on vehicle/tractor.➤ Test for correct functioning.	<ul style="list-style-type: none">➤ Knowledge on health & safety precautions observed in workshop.➤ Necessity of Radiator in vehicle/tractor.➤ Description of Radiator.➤ Types of Radiator and their size.➤ Types of Radiator tubes.➤ Use of Radiator Tubes.➤ Method of Radiation➤ Inspection of Radiator.➤ Knowledge of brazing and welding.➤ Periodical maintenance .➤ Trouble shooting .

TOOLS & EQUIPMENTS

S.No.	Item
1.	Wheel type Tractor
2.	Steel rule 15 cm. English and metric
3.	Screw driver 20 cm.x 9mm blade
4.	Screw driver 30 cm x 9 mm blade
5.	Pliers combination 20 cm
6.	Pliers nose 15 cm.
7.	Vice grip pliers.
8.	Hand file 20 cm flat
9.	Hand file 15 cm triangular
10.	Steel tool box with lock & key(folding type) size 400x200x150mm
11.	Allen Key set of 12 pieces (2mm to 14 mm)
12.	Philips Screw Driver Type set of 5 pieces 100 mm to 300 mm 04 Sets 34 Spanner, ring offset set
13.	Scriber 15 cm with scribing block universal
14.	Centre punch 10 mm dia x 100 mm
15.	Chisel cold flat 20 mm
16.	Hacksaw frame adjustable for 30 cm blade
17.	Mallets (Wooden/plastic)
18.	Cross peen Hammer 1 kg
19.	Ball peen Hammer 0.5 Kg.
20.	Spanner D E set of 12 pieces (6mm to 32 mm)
21.	Ring spanner set of 12 pieces (6mm to 32 mm.)
22.	Spanner, adjustable 20 cm.
23.	Spanners socket of 8 with handles, T bar and ratchet
24.	Wheel choke
25.	Cleaning trays 45 x 30 cm.
26.	Stud remover.
27.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
28.	Radiator testing bench
29.	Soldering iron 100 & 200 gms.
30.	Hand blower/electric blower furnace
31.	Air compressor
32.	Water tank for radiator checking

Level – I

- 1. Module name** : Repair, maintenance & field operation of Energy Sources devices.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR103
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
- 5. Terminal competency:** : Successful candidate would be able to carry out repair, maintenance & field operation of Energy Sources devices.
- 6. Duration** : 90 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Familiarization with wind mill generators, solar Drier, Water plant, solar operating street light . ➤ Practice in services and maintenance of wind mill, genitors, solar Drier, Water plant, solar operator street light . ➤ Practice in repair and maintenance of bio-gas plant. ➤ Installation of wind mill and solar devices. ➤ Adjustment of of wind mill generators, solar Drier, Water plant, solar operator street light . ➤ Uses of bio- fuel gas in Diesel Engines. ➤ Operation of of wind mill generators, solar Drier, Water plant, solar operator street light . ➤ Faults and remedies . ➤ Precaution while using wind mill and solar devices. 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions and first aid ➤ Introduction and scope of non-conventional energy sources in agriculture. . ➤ Working Principal and constructional detail of Wind mills ➤ Study of solar energy appliances . ➤ Study of cook stoves, Smokeless chulhas, gasifiers. ➤ Adjustments of cook stoves, Smokeless chulhas, gasifiers. ➤ Introduction to briqueting. ➤ Installation wind mill generators, solar Drier, Water plant, solar operator street light . ➤ Common faults and remedies. ➤ Care and maintenance. ➤ Safety precaution in the use of with wind mill generators, solar Drier, Water plant, solar operator street light .

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.	Pliers round 15 cm
6.	Pliers flat nose 15 cm
7.	Pliers side cutting 15 cm
8.	Vice grip pliers.
9.	Circlip pliers Expanding and contracting type 15 cm and 20 cm each 8 sets.
10.	Hand file 20 cm. Second cut half round
11.	Hand file 30 cm bastard flat
12.	Hand file 30 cm bastard round
13.	Feeler gauge 20 blades (metric)
14.	Steel tool box with lock & key(folding type) size 400x200x150mm
15.	Allen Key set of 12 pieces (2mm to 14 mm)
16.	Philips Screw Driver Type set of 5 pieces 100 mm to 300 mm 04 Sets 34 Spanner, ring offset set
17.	Engineer's square 15 cm blade
18.	Divider spring joint 15 cm.
19.	Scriber 15 cm with scribing block universal
20.	Pick punch 15 cm 2nos.
21.	Drift punch copper 15 cm
22.	Centre punch 10 mm dia x 100 mm
23.	Chisel cold flat 20 mm
24.	Chisels Cross cut 200mm x 6 mm
25.	Hacksaw frame adjustable for 30 cm blade
26.	Drill Twist (assorted)
27.	Drill electric hand 6-12 mm
28.	Electric pedestal grinder with two wheel
29.	Electric Arc Welding Set
30.	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.
31.	Tachometer – to read up to 5000 rpm
32.	Mallets (Wooden/plastic)
33.	Ball peen Hammer 0.5 Kg.
34.	Cross peen Hammer 1 kg
35.	Spanner D E set of 12 pieces (6mm to 32 mm)
36.	Ring spanner set of 12 pieces (6mm to 32 mm.)
37.	Spanner, adjustable 20 cm.
38.	Spanner adjustable (pipe wrench) 350 mm
39.	Spanners socket of 8 with handles, T bar and ratchet
40.	Screw jack 1ton 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.	Triple leg grip puller with bearings attachment screw/hydraulic powered max. Spread 80,160,50,450 mm.
46.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
47.	Pulley puller disc type for pulley
48.	Wind Mill
49.	Generator
50.	Solar Drier
51.	Water Plant
52.	Solar Street Light
53.	Solar battery charger up to 120 volts

LEVEL-II

- 1. Module name** : Repair and Overhauling of Tractor.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR214
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
+ AGR101
- 5. Terminal competency** : Successful candidate would be able to carry out Repair & Overhauling of Assemblies of Tractor.
- 6. Duration** : 480 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Identify different systems of tractor . ➤ Practice in dismantle and assemble the Clutch assembly. ➤ Check & repair the Clutch assembly. ➤ Replace clutch lining. ➤ Adjust the Presser plate. ➤ Check and repair gear box, differential and final drive. ➤ Adjustment back-lash play in differential. ➤ Align gear selector fork. ➤ Check and adjust differential lock. ➤ Practice in dismantle and assemble the brakes. ➤ Replace lining of brake shoe. ➤ Adjust mechanical brakes. ➤ Bleed- hydraulic brakes. ➤ Adjust hydraulic brakes. ➤ Practice in dismantle and assemble the Steering system. ➤ Adjust toe-in and toe-out, wheel track, king pin and caster-angle . ➤ Overall hydraulic power assisted steering system. ➤ Precaution while handling Overhauling different system. 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions observed in workshop & field. ➤ Familiarization with different system of Tractor. ➤ Working Principal and Constructional details of different system of Tractor. ➤ Types of clutch used in Tractor. ➤ Faults finding in clutch system. ➤ Types of gear box used in Tractor. ➤ Working Principal and Constructional details of gear box. ➤ Function and Working of planetary gear box. ➤ Working Principal and Constructional details of differential . ➤ Adjustments of gear box and differential. ➤ Classifications of break system, factors affecting the braking distance. ➤ Working Principal and Constructional details of different types of brakes. ➤ Advantages of hydraulic brake system over mechanical system. ➤ Types of steering system. ➤ Adjustment of steering geometry. ➤ Necessity of tyre rotation . ➤ Use of big size tyre in rear of Tractor. ➤ Care and maintenance.

TOOLS & EQUIPMENTS

S.No.	Item
1.	Steel rule 15 cm. English and metric
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.	Electric pedestal grinder with two wheel
34.	Taps and Dies complete set in a box (metric) with handle.
35.	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.
36.	Cylinder bore gauge 20 to 160 mm
37.	Micrometer outside 0-25mm, 25-50mm, 50-75mm, 75-100mm.
38.	Micrometer inside 25-50, 50-75, 75-150mm with extension rod.
39.	Vernier Caliper 250 or 200 mm inside, outside & depth.
40.	Tachometer – to read up to 5000 rpm
41.	Mallets (Wooden/plastic)
42.	Ball peen Hammer 0.5 Kg.
43.	Spanner D E set of 12 pieces (6mm to 32 mm)
44.	Ring spanner set of 12 pieces (6mm to 32 mm.)
45.	Spanner, adjustable 20 cm.
46.	Spanner adjustable (pipe wrench) 350 mm
47.	Spanners socket of 8 with handles, T bar and ratchet
48.	Chain and Pulley block 3000 Kg capacity
49.	Horses and wheel choke
50.	Screw jack 4 ton capacity double lift
51.	Hydraulic jack 3 ton capacity with trolley
52.	Oil can 0.5-liter cap
53.	Cleaning trays 45 x 30 cm.
54.	Torque wrench set of 3 Nos.

55.	Inspection lamp with guard and wandering lead of 100 ft.
56.	Stud remover.
57.	'V' Block 75 x 38 mm pair with Clamps.
58.	Surface plate 60x60 cm
59.	Compression testing gauge to read 0 to 760 mm of Hg.
60.	Piston Ring compressor & Ring Expander.
61.	Piston ring filer/groove cleaner
62.	Cylinder ridge remover/cutter
63.	Triple leg grip puller with bearings attachment screw/hydraulic powered max. Spread 80,160,50,450 mm.
64.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
65.	Pullers screw powered 2mm with bearing puller attachment.
66.	Bearing puller screw powered/hydraulic powered with attachments
67.	Hydrometer.
68.	Valve spring lifter.
69.	Valve key inserter 1 no.
70.	Valve grinding tool set
71.	Fuel injection pump one with pneumatic governor one with RQ governor and one with R.S.V. Governor, VE pump and DPC pump
72.	Fuel feed pump.
73.	Fuel injection pump test bench with accessories
74.	Injectors of diesel engines.
75.	Injector cleaning kit
76.	Injector dismantling & assembling jig & fixture
77.	Injector dismantling tool kit
78.	Injector testing set (hand operated)
79.	Engine management system's Sensors & Actuators – 4 sets.
80.	Wheel alignment gauge (computerized)
81.	Camber angle gauge
82.	Toe-in, toe-out gauge
83.	Engine 4 cylinder diesel
84.	Gear Box (sliding mesh)
85.	Steering gear box
86.	Disc brake with caliper assembly
87.	Differential assembly
88.	Water pump assembly and radiator
89.	Oil pump

Level – II

- 1. Module name** : Repair ,Maintenance of Operations of Power Tiller.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR215
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
+ AGR101
- 5. Terminal competency** : Successful candidate would be able to carry out Repair, Maintenance of Operations of Power Tiller.
- 6. Duration** : 240 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Identify different systems of Power Tiller. ➤ Practice in dismantle and assemble the Power Tiller. ➤ Check & repair the Clutch assembly. ➤ Adjust the Presser plate. ➤ Check and repair gear box, differential and Rotary-drive. ➤ Adjustment of transmission. ➤ Practice in dismantle and assemble the Rotary-Plough. ➤ Replace Rotary-Plough . ➤ Fit trolley bracket. ➤ Adjust mechanical brakes. ➤ Practice in dismantle and assemble the Steering system. ➤ Practice in dismantle and assemble the Steering brake. ➤ Field operation of Power tiller. 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions observed in workshop & field. ➤ Scope of Power Tiller in India. ➤ Familiarization with different system of Power Tiller. ➤ Working Principal and Constructional details of different system of Power Tiller. ➤ Types of clutch used in Power Tiller. ➤ Faults finding in clutch system. ➤ Types of gear box used . ➤ Types of steering system. ➤ Adjustment of steering System. ➤ Operation of Power Tiller with Rotavator, weeder, Reaper and Fodder harvester . ➤ Periodical maintenance . ➤ Trouble shooting . ➤ Economics of operation.

TOOLS & EQUIPMENTS

S.No.	Item
1.	Power Tiller
2.	Steel rule 15 cm. English and metric
3.	Screw driver 20 cm.x 9mm blade
4.	Pliers combination 20 cm
5.	Pliers round 15 cm
6.	Pliers flat nose 15 cm
7.	Pliers side cutting 15 cm
8.	Vice grip pliers.
9.	Circlip pliers Expanding and contracting type 15 cm and 20 cm each 8 sets.
10.	Hand file 20 cm. Second cut half round
11.	Hand file 20 cm. Smooth triangular
12.	Hand file 30 cm bastard round
13.	Feeler gauge 20 blades (metric)
14.	Steel tool box with lock & key(folding type) size 400x200x150mm
15.	Allen Key set of 12 pieces (2mm to 14 mm)
16.	Philips Screw Driver Type set of 5 pieces 100 mm to 300 mm 04 Sets 34 Spanner, ring offset set
17.	Divider spring joint 15 cm.
18.	Scriber 15 cm with scribing block universal
19.	Pick punch 15 cm 2nos.
20.	Drift punch copper 15 cm
21.	Centre punch 10 mm dia x 100 mm
22.	Chisel cold flat 20 mm
23.	Chisels Cross cut 200mm x 6 mm
24.	Hacksaw frame adjustable for 30 cm blade
25.	Engineer's Stethoscope 04 Screw driver 30 cm x 9 mm blade
26.	Hand vice 37 mm
27.	Drill Twist (assorted)
28.	Drill electric hand 6-12 mm
29.	Washing unit
30.	Electric pedestal grinder with two wheel
31.	Electric arc welding set portable
32.	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.
33.	Cylinder bore gauge 20 to 160 mm
34.	Micrometer outside 0-25mm, 25-50mm, 50-75mm, 75-100mm.
35.	Micrometer inside 25-50, 50-75, 75-150mm with extension rod.
36.	Vernier Caliper 250 or 200 mm inside, outside & depth.
37.	Tachometer – to read up to 5000 rpm
38.	Mallets (Wooden/plastic)
39.	Ball peen Hammer 0.5 Kg.
40.	Spanner D E set of 12 pieces (6mm to 32 mm)
41.	Ring spanner set of 12 pieces (6mm to 32 mm.)
42.	Spanner, adjustable 20 cm.
43.	Spanner adjustable (pipe wrench) 350 mm
44.	Spanners socket of 8 with handles, T bar and ratchet
45.	Screw jack 1 ton capacity double lift
46.	Oil can 0.5-liter cap
47.	Cleaning trays 45 x 30 cm.
48.	Torque wrench set of 3 Nos.
49.	Stud remover.
50.	'V' Block 75 x 38 mm pair with Clamps.
51.	Surface plate 60x60 cm
52.	Compression testing gauge to read 0 to 760 mm of Hg.
53.	Piston Ring compressor & Ring Expander.
54.	Piston ring filer/groove cleaner
55.	Cylinder ridge remover/cutter
56.	Triple leg grip puller with bearings attachment screw/hydraulic powered max. Spread 80,160,50,450 mm.
57.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
58.	Pullers screw powered 2mm with bearing puller attachment.
59.	Bearing puller screw powered/hydraulic powered with attachments
60.	Valve spring lifter.
61.	Valve key inserter 1 no.
62.	Valve grinding tool set
63.	Fuel feed pump.
64.	Injector cleaning kit
65.	Injector dismantling & assembling jig & fixture
66.	Injector dismantling tool kit
67.	Injector testing set (hand operated)
68.	Engine management system's Sensors & Actuators – 4 sets.

Level – II

- 1. Module name** : Repair & Overhauling of Hydraulics system.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR216
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age.
+AGR101
- 5. Terminal competency** : Successful candidate would be able to carry out Repair & Overhauling of Hydraulics system.
- 6. Duration** : 150 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Study the various components of hydraulics system. ➤ Practice in dismantle and assemble the hydraulics system. ➤ Check & repair the hydraulics pump, distributor, ram-cylinder and relief valve. ➤ Set and adjust the Hydraulics pressures . ➤ Drive mechanism of hydraulic system. ➤ Hitch practice of Agriculture equipment with three point linkage system. ➤ Operation of Hydraulic system in field. ➤ Trouble shooting during Field operation. 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions observed in workshop & field. ➤ Basic of hydraulics system. ➤ Application of hydraulic in modern machine/tractor. ➤ Familiarization with different hydraulic system. ➤ Working Principal and Constructional details of hydraulic system. ➤ Types of Hydraulic system. ➤ Components of Hydraulic system. ➤ Study of draft, position and mixed control system. ➤ Study of various components and control geometry of three point linkage. ➤ Faults finding in hydraulic system. ➤ Adjustment and operation of hydraulic system in field. ➤ Periodical maintenance . ➤ Trouble shooting .

TOOLS & EQUIPMENTS

S.No.	Item
1.	Tractor with draft & position control hydraulic lift
2.	Steel rule 15 cm. English and metric
3.	Screw driver 20 cm.x 9mm blade
4.	Pliers combination 20 cm
5.	Pliers round 15 cm
6.	Pliers flat nose 15 cm
7.	Pliers side cutting 15 cm
8.	Vice grip pliers.
9.	Circlip pliers Expanding and contracting type 15 cm and 20 cm each 8 sets.
10.	Hand file 20 cm. Second cut half round
11.	Hand file 20 cm. Smooth triangular
12.	Hand file 30 cm bastard round
13.	Feeler gauge 20 blades (metric)
14.	Steel tool box with lock & key(folding type) size 400x200x150mm
15.	Allen Key set of 12 pieces (2mm to 14 mm)
16.	Philips Screw Driver Type set of 5 pieces 100 mm to 300 mm 04 Sets 34 Spanner, ring offset set
17.	Scriber 15 cm with scribing block universal
18.	Pick punch 15 cm 2nos.
19.	Drift punch copper 15 cm
20.	Centre punch 10 mm dia x 100 mm
21.	Chisel cold flat 20 mm
22.	Chisels Cross cut 200mm x 6 mm
23.	Hacksaw frame adjustable for 30 cm blade
24.	Engineer's Stethoscope 04 Screw driver 30 cm x 9 mm blade
25.	Hand vice 37 mm
26.	Drill Twist (assorted)
27.	Drill electric hand 6-12 mm
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.	Micrometer outside 0-25mm, 25-50mm, 50-75mm, 75-100mm.
30.	Micrometer inside 25-50, 50-75, 75-150mm with extension rod.
31.	Vernier Caliper 250 or 200 mm inside, outside & depth.
32.	Mallets (Wooden/plastic)
33.	Ball peen Hammer 0.5 Kg.
34.	Spanner D E set of 12 pieces (6mm to 32 mm)
35.	Ring spanner set of 12 pieces (6mm to 32 mm.)
36.	Spanner, adjustable 20 cm.
37.	Spanner adjustable (pipe wrench) 350 mm
38.	Spanners socket of 8 with handles, T bar and ratchet
39.	Screw jack 1 ton capacity double lift
40.	Oil can 0.5-liter cap
41.	Cleaning trays 45 x 30 cm.
42.	Torque wrench set of 3 Nos.
43.	Stud remover.
44.	'V' Block 75 x 38 mm pair with Clamps.
45.	Surface plate 60x60 cm
46.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
47.	Hydraulic pump
48.	Hydraulic distributor
49.	Ram cylinder
50.	Master cylinder (Hydraulic brake)
51.	Wheel cylinder (Hydraulic brake)
52.	Hydraulic steering gear box (hydro static)
53.	Auxiliary hydraulic system with nipple & connection

Level – II

- 1. Module name** : Cultivation for Oil Seeds and Pulses.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR222
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
+ AGR101 – 111 (Anyone of the courses)
- 5. Terminal competency** : Successful candidate would be able to carry out Cultivation for Oil Seeds and Pulses.
- 6. Duration** : 90 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none">➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety.➤ Driving practice of Tractor.➤ Demonstration of seed- bed preparation equipments.➤ Calibration of oil seeds drills.➤ Calibration of row crop planters.(Sunflower & groundnut).➤ Different methods of sowing.➤ Use of Fertilizers applicator.➤ Selection and demonstration of intercultural and beading equipments.➤ Practice on Irrigation.➤ Safe operation of plant protection equipments.➤ Demonstration of resetting and adjustment of sprayer and duster.➤ Practice on threshing for oil seed and pulses.➤ Practice on harvesting of Oil Seeds and Pulses.➤ Practice of cleaning and grading .➤ Practice of packaging/storing .	<ul style="list-style-type: none">➤ Knowledge on health & safety precautions and first aid➤ Scope of Oil seed crops .➤ Production of Oil seeds in India.➤ Production technology for Kharif crops like sunflower, groundnut, soyabean, red, black and green gram.➤ Production technology for Rabi crops. Like mustard and Toria etc.➤ Cropping system for advancing oil seed production.➤ Improved varieties of all oil seeds and pulses crops.

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.	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.	Divider spring joint 15 cm.
14.	Scriber 15 cm with scribing block universal
15.	Pick punch 15 cm 2nos.
16.	Drift punch copper 15 cm
17.	Centre punch 10 mm dia x 100 mm
18.	Chisel cold flat 20 mm
19.	Chisels Cross cut 200mm x 6 mm
20.	Hacksaw frame adjustable for 30 cm blade
21.	Hand vice 37 mm
22.	Drill Twist (assorted)
23.	Drill electric hand 6-12 mm
24.	Electric pedestal grinder with two wheel
25.	Electric arc welding set portable
26.	Air Compressure
27.	Air Pressure Gauge
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.	Spanner D E set of 12 pieces (6mm to 32 mm)
33.	Ring spanner set of 12 pieces (6mm to 32 mm.)
34.	Spanner, adjustable 20 cm.
35.	Spanner adjustable (pipe wrench) 350 mm
36.	Spanners socket of 8 with handles, T bar and ratchet
37.	Horses and wheel choke
38.	Screw jack 4 ton capacity double lift
39.	Oil can 0.5-liter cap
40.	Grease Gun Hand/Pneumatic
41.	Cleaning trays 45 x 30 cm.
42.	Stud remover.
43.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
44.	Pullers screw powered 2mm with bearing puller attachment.
45.	Bearing puller screw powered/hydraulic powered with attachments
46.	Disc Harrow tandem and off set
47.	Spike tooth harrow – Power harrow
48.	Cultivator (shovel type and sweep type)
49.	Leveler
50.	Bund maker
51.	Oil Seed drill
52.	Row crop Planter
53.	Sprayer (Knapsack & Power Operated)
54.	Rotary Duster
55.	Centrifugal pump with motor
56.	Submersible pump
57.	Reaper
58.	Threshers for sunflower, groundnut, soybean, red, black & green gram
59.	Tractor Operator Combine Harvester
60.	Diesel Engine/Generator Set
61.	Power tiller

Level – II

- 1. Module name** : Cultivation for Vegetables.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR223
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
+ AGR101 – 111 (Anyone of the courses)
- 5. Terminal competency** : Successful candidate would be able to carry out Cultivation for Vegetables..
- 6. Duration** : 150 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Driving practice of Tractor. ➤ Selection of soil and demonstration of seed- bed preparation equipments. ➤ Calibration and operation of seeds drills. ➤ Operation of trans planter. ➤ Different methods of sowing. ➤ Use of Fertilizers applicator. ➤ Selection and demonstration of intercultural and beading equipments. ➤ Installation of micro, drip and sprinkler Irrigation. ➤ Safe operation of plant protection equipments. ➤ Selection , maintenance and adjustment of sprayer and duster. ➤ Calibration and precaution during operation. ➤ Practice on harvesting of Vegetables (Manually/digger suitable for specific crops. ➤ Practice of packaging/storing . ➤ Cost analysis for cultivation of vegetables. 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions and first aid ➤ Scope of Vegetables cultivation. ➤ Major crops, grown in India. ➤ Selection of improved varieties. ➤ Study of soil type and climate . ➤ Water requirement and moisture conservation technique. ➤ Methods of sowing such as drilling, planting, trans planting and budding . ➤ Off season storage, techniques of vegetables. ➤ Methods of Marketing . ➤ Cost analysis for cultivation of vegetables.

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 30 cm bastard flat
8.	Hand file 30 cm bastard round
9.	Steel tool box with lock & key(folding type) size 400x200x150mm
10.	Allen Key set of 12 pieces (2mm to 14 mm)
11.	Scriber 15 cm with scribing block universal
12.	Pick punch 15 cm 2nos.
13.	Drift punch copper 15 cm
14.	Chisel cold flat 20 mm
15.	Chisels Cross cut 200mm x 6 mm
16.	Hacksaw frame adjustable for 30 cm blade
17.	Bench vice
18.	Drill Twist (assorted)
19.	Drill electric hand 6-12 mm
20.	Taps and Dies complete set in a box (metric) with handle.
21.	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.
22.	Copper Hammer
23.	Ball peen Hammer 0.5 Kg.
24.	Cross peen Hammer 1 kg
25.	Sledge Hammer
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.	Screw jack 4 ton capacity double lift
32.	Oil can 0.5-liter cap
33.	Grease Gun Hand/Pneumatic
34.	Cleaning trays 45 x 30 cm.
35.	Stud remover.
36.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
37.	Pullers screw powered 2mm with bearing puller attachment.
38.	Bearing puller screw powered/hydraulic powered with attachments
39.	Disc Harrow tandem and off set
40.	Spike tooth harrow – Power harrow
41.	Cultivator (shovel type and sweep type)
42.	Leveler
43.	Bund maker
44.	Seed drill
45.	Vegetable Trans-planter
46.	Sprayer (Knapsack & Power Operated)
47.	Rotary Duster
48.	Centrifugal pump with motor
49.	Power weeder
50.	Seed thresher
51.	Seed extractor
52.	Diesel Engine/Generator Set
53.	Power tiller

Level – II

- 1. Module name** : Cultivation of Orchards with special reference to Citers
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR224
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
+ AGR101 – 111 (Anyone of the courses)
- 5. Terminal competency** : Successful candidate would be able to carry out Cultivation for Orchards.
- 6. Duration** : 120 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Driving practice of Tractor. ➤ Selection of soil . ➤ Uses of equipments to prepare bed. ➤ Methods of preparation of nursery . ➤ Operation of trans planter. ➤ Different methods of Plantation. ➤ Use of Fertilizers applicator. ➤ Selection and demonstration of inter-cultural and use of power beadier. ➤ Installation of micro, drip and sprinkler Irrigation for Orchards ➤ Demonstration/Operation of Orchards sprayers/Aero-Blast sprayers. ➤ Operation of picking flat form. ➤ Practice of packaging/storing. ➤ Practice on sealing/waxing machine. ➤ Cost analysis for cultivation of Orchards. 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions and first aid ➤ Scope of Orchards cultivation. ➤ Citrus Orchards, grown in India. ➤ Selection of improved varieties. ➤ Study of soil type and climate . ➤ Method of preparation for nursery. ➤ Water requirement and moisture conservation technique. ➤ Methods of trans planting by manually/ trans planter. ➤ Safe operation of plant protection . ➤ Method of picking citrus . ➤ Method of packaging and sealing . ➤ Off season storage and its techniques . ➤ Methods of Marketing . ➤ Cost analysis for cultivation of citrus.

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.	Bench Vice
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 30 cm bastard flat
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.	Chisel cold flat 20 mm
16.	Chisels Cross cut 200mm x 6 mm
17.	Hacksaw frame adjustable for 30 cm blade
18.	Drill Twist (assorted)
19.	Drill electric hand 6-12 mm
20.	Air Compressor
21.	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.
22.	Mallets (Wooden/plastic)
23.	Ball peen Hammer 0.5 Kg.
24.	Cross peen Hammer 1 kg
25.	Spanner D E set of 12 pieces (6mm to 32 mm)
26.	Ring spanner set of 12 pieces (6mm to 32 mm.)
27.	Spanner, adjustable 20 cm.
28.	Spanner adjustable (pipe wrench) 350 mm
29.	Spanners socket of 8 with handles, T bar and ratchet
30.	Chain and Pulley block 3000 Kg capacity
31.	Horses and wheel choke
32.	Screw jack 4 ton capacity double lift
33.	Oil can 0.5-liter cap
34.	Grease Gun Hand/Pneumatic
35.	Cleaning trays 45 x 30 cm.
36.	Torque wrench set of 3 Nos.
37.	Stud remover.
38.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
39.	Pullers screw powered 2mm with bearing puller attachment.
40.	Bearing puller screw powered/hydraulic powered with attachments
41.	Disc harrow (tandem and offset)
42.	Spike tooth and bar harrow – blade harrow
43.	Cultivator (shovel and sweep type)
44.	Leveler
45.	Trans planter – hole digger
46.	Fertilizer Applicator
47.	Power weeder
48.	Micro – dip irrigation unit
49.	Orchard sprayer
50.	Aero blast sprayer
51.	Picking platform with trailer
52.	Tree branch prunner cum picker
53.	Washing Machine
54.	Grading Machine
55.	Waxing Machine

Level – II

- 1. Module name** : Cultivation for Potato.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR225
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
+ AGR101 – 111 (Anyone of the courses)
- 5. Terminal competency** : Successful candidate would be able to carry out Cultivation for Potato.
- 6. Duration** : 120 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Driving practice of Tractor. ➤ Selection of soil . ➤ Demonstration for seed- bed preparation equipments. ➤ Calibration of semi/automatic, Potato planter. ➤ Operation of automatic potato planter. ➤ Use of Fertilizers applicator. ➤ Selection and demonstration of inter-cultural and beading equipments. ➤ Use of irrigation equipments. ➤ Safe operation of plant protection equipments. ➤ Demonstration for raising soil with Potato bunds with ridger. ➤ Practice on harvesting of Potato by manually /with Potato digger or potato harvester. ➤ Practice of cleaner & grader. ➤ Practice of packaging/storing . 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions and first aid ➤ Scope of Potato cultivation. ➤ Potato crop, grown in India. ➤ Selection of improved varieties. ➤ Study of soil type and climate . ➤ Working and constructional details of seed bed preparation equipments. ➤ Methods of calibration . ➤ Workshop and field adjustment of potato planters. ➤ Water requirement and moisture conservation technique. ➤ Selection for irrigation methods. ➤ Working and operation of harvesting equipments. ➤ Necessity of grading of Potato. ➤ Storage of Potato. ➤ Methods of Marketing . ➤ Cost analysis for cultivation of vegetables.

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.	Bench Vice
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.	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.	Air Compressure
28.	Air Pressure Gauge
29.	Taps and Dies complete set in a box (metric) with handle.
30.	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.
31.	Copper Hammer
32.	Ball peen Hammer 0.5 Kg.
33.	Cross peen Hammer 1 kg
34.	Sledge Hammer
35.	Spanner D E set of 12 pieces (6mm to 32 mm)
36.	Ring spanner set of 12 pieces (6mm to 32 mm.)
37.	Spanner, adjustable 20 cm.
38.	Spanner adjustable (pipe wrench) 350 mm
39.	Spanners socket of 8 with handles, T bar and ratchet
40.	Horses and wheel choke
41.	Screw jack 4 ton capacity double lift
42.	Oil can 0.5-liter cap
43.	Grease Gun Hand/Pneumatic
44.	Cleaning trays 45 x 30 cm.
45.	Stud remover.
46.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
47.	Pullers screw powered 2mm with bearing puller attachment.
48.	Bearing puller screw powered/hydraulic powered with attachments
49.	Ploughs
50.	Disc Harrow tandem and off set
51.	Spike tooth harrow – Power harrow
52.	Cultivator (shovel type and sweep type)
53.	Leveler
54.	Ridger
55.	Planter (Semi – Automatic)
56.	Sprayer (Knapsack & Power Operated)
57.	Centrifugal pump with motor
58.	Submersible pump
59.	Potato digger & shaker
60.	Potato grader
61.	Potato Combine Harvester
62.	Diesel Engine/Generator Set
63.	Tractor Trailer
64.	Potato ridger cum fertilizer applicator

Level – II

- 1. Module name** : Cultivation for Cotton .
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR226
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
+ AGR101 – 111 (Anyone of the courses)
- 5. Terminal competency** : Successful candidate would be able to carry out Cultivation for Cotton.
- 6. Duration** : 120 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Driving practice of Tractor. ➤ Selection of soil . ➤ Demonstration for seed- bed preparation equipments. ➤ Calibration of Cotton planter. ➤ Operation of planter. ➤ Use of Fertilizers applicator. ➤ Selection and demonstration of inter-cultural equipments. ➤ Demonstration of power beader in Cotton crop. ➤ Use of irrigation equipments. ➤ Safe operation of plant protection equipments. ➤ Demonstration of Self-propelled High Clearance, Aero-Blast Sprayer ➤ Practice of picking cotton by manually /with cotton picker. ➤ Practice of packaging/storing . 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions and first aid ➤ Scope of Cotton cultivation. ➤ Cotton crop, grown in India. ➤ Selection of improved varieties. ➤ Study of soil type and climate . ➤ Working and constructional details of seed bed preparation equipments. ➤ Methods of calibration of Cotton planters . ➤ Workshop and field adjustment of Cotton planters. ➤ Water requirement . ➤ Selection for irrigation methods. ➤ Cotton picking methods. ➤ Working and operation of Cotton picking equipments. ➤ Methods of packing . ➤ Storage of Cotton. ➤ Methods of Marketing . ➤ Cost analysis for cultivation of Cotton.

TOOLS & EQUIPMENTS

S.No.	Item
1.	Tractor with trailer
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.	Bench Vice
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.	Scriber 15 cm with scribing block universal
15.	Pick punch 15 cm 2nos.
16.	Drift punch copper 15 cm
17.	Centre punch 10 mm dia x 100 mm
18.	Chisel cold flat 20 mm
19.	Chisels Cross cut 200mm x 6 mm
20.	Hacksaw frame adjustable for 30 cm blade
21.	Hand vice 37 mm
22.	Drill Twist (assorted)
23.	Drill electric hand 6-12 mm
24.	Electric pedestal grinder with two wheel
25.	Electric arc welding set portable
26.	Air Compressure
27.	Air Pressure Gauge
28.	Taps and Dies complete set in a box (metric) with handle.
29.	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.
30.	Copper Hammer
31.	Ball peen Hammer 0.5 Kg.
32.	Cross peen Hammer 1 kg
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.	Horses and wheel choke
39.	Screw jack 4 ton capacity double lift
40.	Oil can 0.5-liter cap
41.	Grease Gun Hand/Pneumatic
42.	Cleaning trays 45 x 30 cm.
43.	Stud remover.
44.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
45.	Pullers screw powered 2mm with bearing puller attachment.
46.	Bearing puller screw powered/hydraulic powered with attachments
47.	Ploughs MB (Augur type)
48.	Disc Plough (reversible)
49.	Disc Harrow tandem and off set
50.	Spike tooth harrow – Power harrow – Blade harrow
51.	Cultivator (shovel type and sweep type)
52.	Leveler
53.	Bund maker
54.	Planter
55.	Fertilizer applicator
56.	Sprayer (Knapsack & Power Operated)
57.	Aero blast sprayer
58.	Self propelled light weight sprayer
59.	Rotary Duster
60.	Burner type weeder
61.	Power weeder
62.	Centrifugal pump with motor
63.	Submersible pump
64.	Cotton picker
65.	Diesel Engine/Generator Set

Level – II

- 1. Module name** : Cultivation for Groundnut and Sunflower.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR227
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
+ AGR101 – 111 (Anyone of the courses)
- 5. Terminal competency** : Successful candidate would be able to carry out Cultivation for Groundnut and Sunflower.
- 6. Duration** : 120 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Driving practice of Tractor. ➤ Selection of soil . ➤ Demonstration for seed- bed preparation equipments. ➤ Calibration of planter for Groundnut. ➤ Calibration of planter for Sunflower. ➤ Operation of planter for Groundnut and Sunflower. ➤ Use of Fertilizers applicator. ➤ Selection and demonstration of inter-cultural equipments. ➤ Use of irrigation equipments. ➤ Safe operation of plant protection equipments. ➤ Riské methods from worlds and rats. ➤ Practice of harvesting groundnut with digger. ➤ Practice of harvesting Sunflower with combine harvester. ➤ Practice of Cleaner & grader . ➤ Practice of packaging/storing . 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions and first aid ➤ Scope of Groundnut and Sunflower cultivation. ➤ Groundnut crop, grown in India. ➤ Sunflower crop, grown in India. ➤ Selection of improved varieties. ➤ Study of soil type and climate . ➤ Working and constructional details of seed bed preparation equipments. ➤ Methods of calibration of planters . ➤ Workshop and field adjustment of planters. ➤ Water requirement . ➤ Selection for irrigation methods. ➤ Methods of harvesting of Groundnut and Sunflower. ➤ Methods of Cleaning and grading . ➤ Storage of Groundnut. ➤ Storage of Sunflower. ➤ Methods of Marketing . ➤ Cost analysis for cultivation of Groundnut and Sunflower.

TOOLS & EQUIPMENTS

S.No.	Item
1.	Tractor with trailer
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.	Bench Vice
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.	Scriber 15 cm with scribing block universal
15.	Pick punch 15 cm 2nos.
16.	Drift punch copper 15 cm
17.	Centre punch 10 mm dia x 100 mm
18.	Chisel cold flat 20 mm
19.	Chisels Cross cut 200mm x 6 mm
20.	Hacksaw frame adjustable for 30 cm blade
21.	Hand vice 37 mm
22.	Drill Twist (assorted)
23.	Drill electric hand 6-12 mm
24.	Electric pedestal grinder with two wheel
25.	Electric arc welding set portable
26.	Air Compressure
27.	Air Pressure Gauge
28.	Taps and Dies complete set in a box (metric) with handle.
29.	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.
30.	Copper Hammer
31.	Ball peen Hammer 0.5 Kg.
32.	Cross peen Hammer 1 kg
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.	Horses and wheel choke
39.	Screw jack 4 ton capacity double lift
40.	Oil can 0.5-liter cap
41.	Grease Gun Hand/Pneumatic
42.	Cleaning trays 45 x 30 cm.
43.	Stud remover.
44.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
45.	Pullers screw powered 2mm with bearing puller attachment.
46.	Bearing puller screw powered/hydraulic powered with attachments
47.	Disc Harrow tandem and off set
48.	Spike tooth harrow – Power harrow – Blade harrow
49.	Cultivator (shovel type and sweep type)
50.	Leveler
51.	Bund maker
52.	Planter for Groundnut & Sunflower
53.	Fertilizer applicator
54.	Sprayer (Knapsack & Power Operated)
55.	Aero blast sprayer
56.	Self propelled light weight sprayer
57.	Rotary Duster
58.	Centrifugal pump with motor
59.	Submersible pump
60.	Groundnut digger
61.	Groundnut decorticator
62.	Thresher for sunflower
63.	Cleaner & grader
64.	Diesel Engine/Generator Set

Level – II

- 1. Module name** : Cultivation for Fodder .
- 2. Sector** : AGRICULTURAL SECTOR
- . Code** : AGR228
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
+ AGR101 – 111 (Anyone of the courses)
- 5. Terminal competency** : Successful candidate would be able to carry out Cultivation for Fodder
- 6. Duration** : 90 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Driving practice of Tractor. ➤ Selection of equipments required for fodder and forge harvesting. ➤ Demonstration of mover, rotary harvester, reaper windrower. ➤ Demonstration of hay rake, hay bailer, tipping trailer. ➤ Demonstration of chaff cutter and silage loader . ➤ Use of irrigation equipments. ➤ Risqué methods from rats. ➤ Maintenance of fodder harvesting equipments. ➤ Methods of straw preparation from wheat. ➤ Methods of briquettes from paddy residue. ➤ Practice of fodder packaging/storing . 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions and first aid ➤ Selection of improved varieties. ➤ Selection of soil and climate ➤ Working and constructional details of mover, rotary harvester, reaper windrower. ➤ Working and constructional details of hay rake, hay bailer, tipping trailer. ➤ Workshop and field adjustment of fodder harvesting equipments. ➤ Methods of harvesting of fodder with different equipments. ➤ Use of chaff cutter. ➤ Methods of storage of fodder in off-season . ➤ Cost analysis for cultivation of fodder.

TOOLS & EQUIPMENTS

S.No.	Item
1.	Tractor with trailer
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.	Bench Vice
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.	Scriber 15 cm with scribing block universal
15.	Pick punch 15 cm 2nos.
16.	Drift punch copper 15 cm
17.	Centre punch 10 mm dia x 100 mm
18.	Chisel cold flat 20 mm
19.	Chisels Cross cut 200mm x 6 mm
20.	Hacksaw frame adjustable for 30 cm blade
21.	Hand vice 37 mm
22.	Drill Twist (assorted)
23.	Drill electric hand 6-12 mm
24.	Electric pedestal grinder with two wheel
25.	Electric arc welding set portable
26.	Air Compressure
27.	Air Pressure Gauge
28.	Taps and Dies complete set in a box (metric) with handle.
29.	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.
30.	Copper Hammer
31.	Ball peen Hammer 0.5 Kg.
32.	Cross peen Hammer 1 kg
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.	Horses and wheel choke
39.	Screw jack 4 ton capacity double lift
40.	Oil can 0.5-liter cap
41.	Grease Gun Hand/Pneumatic
42.	Cleaning trays 45 x 30 cm.
43.	Stud remover.
44.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
45.	Pullers screw powered 2mm with bearing puller attachment.
46.	Bearing puller screw powered/hydraulic powered with attachments
47.	Disc Harrow tandem and off set
48.	Spike tooth harrow – Power harrow – Blade harrow
49.	Cultivator (shovel type and sweep type)
50.	Leveler
51.	Seed cum Fertilizer Drill
52.	Bund maker
53.	Fertilizer applicator
54.	Centrifugal pump with motor
55.	Submersible pump
56.	Mover
57.	Reaper windrower
58.	Rotary harvester
59.	Hay bailer
60.	Chaff cutter and silage cutter
61.	Diesel Engine/Generator Set

Level – II

- 1. Module name** : **Repair, maintenance & field operation of Combine Harvester.**
- 2. Sector** : **AGRICULTURAL SECTOR**
- 3. Code** : **AGR218**
- 4. Entry Qualification** : **Minimum 5th standard passed and 14 years of age + AGR101 – 111 (Anyone of the courses)**
- 5. Terminal competency** : **Successful candidate would be able to carry out repair maintenance & field operation of Combine Harvester.**
- 6. Duration** : **240 hours**

7. COURSE CONTENT :

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Identify different system and components of combine Harvester. ➤ Practice in dismantle and assemble the combine Harvester. ➤ Check & repair the Cutter bar, feeder, thresher, straw walker, sieves, blower and augers. ➤ Adjust the Cutter bar, feeder, thresher, straw walker, sieves, blower and augers. ➤ Replace thresher cylinder wheat/paddy. ➤ Check drive mechanism of combine Harvester. ➤ Workshop adjustment of combine Harvester. ➤ Field operation of combine Harvester in wheat. ➤ Field operation of combine Harvester in paddy. ➤ Adjust cutter bar height. ➤ Adjust thresher cylinder speed according to crop condition. ➤ Adjust grain sieves and blower rpm. ➤ Faults and remedies of combine Harvester. ➤ Precaution while handling combine Harvester in field . 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions observed in workshop & field. ➤ Familiarization with different system and components of combine Harvester. ➤ Purpose of combine Harvester . ➤ Advantages & disadvantage. ➤ Functional systems of combine Harvester. ➤ Working Principal and Constructional details of combine Harvester. ➤ Prime-mover and driving system. ➤ Flow path material of combine Harvester. ➤ Workshop adjustment for wheat & paddy. ➤ Method of field operation. ➤ Field adjustments of combine Harvester. ➤ Recommended speeds for different crops. ➤ Types of losses, their causes & remedies. ➤ Care and maintenance of combine Harvester. ➤ Trouble shooting and remedies ➤ Common accidents and their prevention. ➤ Precautions while using combine Harvester. ➤ Transporting the combine Harvester. ➤ Storage during off season. ➤ Custom hiring of combine Harvester. <p>Evaluation of field Office of combine during operation</p>

TOOLS & EQUIPMENTS

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

Level – II

- 1. Module name** : Repair, maintenance & field operation of Post Harvesting Equipments.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR217
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
+ **AGR101 – 111 (Anyone of the courses)**
- 5. Terminal competency** : Successful candidate would be able to carry out repair maintenance & field operation of Post Harvesting Equipments.
- 6. Duration** : 240 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Identify different components of Cleaner grader, Drier, rice mill, flour mill and decorticator. ➤ Practice in dismantle and assemble the Cleaner grader, Drier, rice mill, flour mill and decorticator. ➤ Check & repair the Cleaner grader Drier and decorticator. ➤ Check & repair the rice mill and flour mill ➤ Repair and Replace the components of Cleaner grader Drier and decorticator. ➤ Repair and replace the components of rice mill and flour mill. ➤ Adjust the Cleaner grader decorticator. ➤ Adjust rice mill and flour mill. ➤ Adjust Drier at recommended temperature. ➤ Check drive mechanism of Cleaner grader, Drier, rice mill, flour mill and decorticator. ➤ Workshop adjustment of Cleaner grader, Drier, rice mill, flour mill and decorticator. ➤ Operation of Cleaner grader, Drier, rice mill, flour mill and decorticator. ➤ Faults and remedies of Cleaner grader, Drier, rice mill, flour mill and decorticator. ➤ Precaution while handling Cleaner grader, Drier, rice mill, flour mill and decorticator. 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions and first aid ➤ Purpose of Cleaner grader, Drier, rice mill, flour mill and decorticator. ➤ Advantages & disadvantage Cleaner grader. ➤ Advantages & disadvantage Drier. ➤ Functional systems of Cleaner grader, decorticator and Drier. ➤ Functional systems of rice mill, flour mill . ➤ Working Principal and Constructional details of Cleaner grader, decorticator and Drier. ➤ Working Principal and Constructional details of rice mill, flour mill . ➤ Types of Cleaner grader, Drier, rice mill, flour mill and decorticator. ➤ Prime-mover and driving system. ➤ Workshop adjustment. ➤ Method of operation . ➤ Recommended temperature for different crops . ➤ Types of losses in rice mill and flour mill. ➤ Care and maintenance. ➤ Trouble shooting and remedies ➤ Common accidents and their prevention.

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.	Pliers round 15 cm
6.	Pliers flat nose 15 cm
7.	Pliers side cutting 15 cm
8.	Vice grip pliers.
9.	Circlip pliers Expanding and contracting type 15 cm and 20 cm each 8 sets.
10.	Hand file 20 cm. Second cut half round
11.	Hand file 30 cm bastard flat
12.	Hand file 30 cm bastard round
13.	Feeler gauge 20 blades (metric)
14.	Steel tool box with lock & key(folding type) size 400x200x150mm
15.	Allen Key set of 12 pieces (2mm to 14 mm)
16.	Philips Screw Driver Type set of 5 pieces 100 mm to 300 mm 04 Sets 34 Spanner, ring offset set
17.	Engineer's square 15 cm blade
18.	Divider spring joint 15 cm.
19.	Scriber 15 cm with scribing block universal
20.	Pick punch 15 cm 2nos.
21.	Drift punch copper 15 cm
22.	Centre punch 10 mm dia x 100 mm
23.	Chisel cold flat 20 mm
24.	Chisels Cross cut 200mm x 6 mm
25.	Hacksaw frame adjustable for 30 cm blade
26.	Drill Twist (assorted)
27.	Drill electric hand 6-12 mm
28.	Electric pedestal grinder with two wheel
29.	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.
30.	Tachometer – to read up to 5000 rpm
31.	Mallets (Wooden/plastic)
32.	Ball peen Hammer 0.5 Kg.
33.	Cross peen Hammer 1 kg
34.	Spanner D E set of 12 pieces (6mm to 32 mm)
35.	Ring spanner set of 12 pieces (6mm to 32 mm.)
36.	Spanner, adjustable 20 cm.
37.	Spanner adjustable (pipe wrench) 350 mm
38.	Spanners socket of 8 with handles, T bar and ratchet
39.	Screw jack 1ton capacity double lift
40.	Oil can 0.5-liter cap
41.	Grease Gun Hand/Pneumatic
42.	Cleaning trays 45 x 30 cm.
43.	Stud remover.
44.	Triple leg grip puller with bearings attachment screw/hydraulic powered max. Spread 80,160,50,450 mm.
45.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
46.	Pulley puller disc type for pulley
47.	Winnower
48.	Cleaner & grader
49.	Drier (Solar/Heater)
50.	Dal Mill
51.	Rice Mill
52.	Floor Mill
53.	Decorticator

Level – II

- 1. Module name** : Repair, maintenance & field operation of Processing Equipments.
- 2. Sector** : **AGRICULTURAL SECTOR**
- 3. Code** : **AGR219**
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
+ **AGR101 – 111 (Anyone of the courses)**
- 5. Terminal competency** : Successful candidate would be able to carry out repair maintenance & field operation of Processing Equipments.
- 6. Duration** : 90hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Identify different components of Oil extractor, Sugar cane crusher, Feed plant, Soybean processing plant, Peeling slicing, chipping tools, Dall mill, feed & spices . ➤ Practice in washing, dismantle and assemble the Oil extractor, Sugar cane crusher, Feed plant, Soybean processing plant, Peeling slicing, chipping tools. ➤ Check & repair the Oil extractor, Sugar cane crusher, Feed plant, Soybean processing plant. ➤ Check & repair the Peeling slicing, chipping tools. ➤ Repair and Replace the components of Oil extractor, Sugar cane crusher, Feed plant, Soybean processing plant. ➤ Repair and replace the tools of Peeling slicing, chipping . ➤ Adjust the Oil extractor, Sugar cane crusher, Feed plant, Soybean processing plant. ➤ Workshop adjustment of Oil extractor, Sugar cane crusher, Feed plant, Soybean processing plant. ➤ Operation of Oil extractor, Sugar cane crusher, Feed plant, Soybean processing plant. ➤ Practice in packaging for different food material and sealing techniques. ➤ Care and maintenance. 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions and first aid ➤ Purpose of Oil extractor, Sugar cane crusher, Feed plant, Soybean processing plant, Peeling slicing, chipping tools. ➤ Working Principal and Constructional details of Oil extractor, Sugar cane crusher, Feed plant and Soybean processing plant, ➤ Introduction to peeling slicing, chipping tools. ➤ Prime-mover and driving system. ➤ Workshop adjustment. ➤ Method of operation . ➤ Importance of packaging ➤ Types of packaging for different foods. ➤ Fillings of plastic package. ➤ Sealing techniques. ➤ Types of losses in Oil extractor, Sugar cane crusher, Feed plant, Soybean processing plant. ➤ Care and maintenance. ➤ Trouble shooting and remedies ➤ Common accidents and their prevention.

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.	Pliers round 15 cm
6.	Pliers flat nose 15 cm
7.	Pliers side cutting 15 cm
8.	Vice grip pliers.
9.	Circlip pliers Expanding and contracting type 15 cm and 20 cm each 8 sets.
10.	Hand file 20 cm. Second cut half round
11.	Hand file 30 cm bastard flat
12.	Hand file 30 cm bastard round
13.	Feeler gauge 20 blades (metric)
14.	Steel tool box with lock & key(folding type) size 400x200x150mm
15.	Allen Key set of 12 pieces (2mm to 14 mm)
16.	Philips Screw Driver Type set of 5 pieces 100 mm to 300 mm 04 Sets 34 Spanner, ring offset set
17.	Engineer's square 15 cm blade
18.	Divider spring joint 15 cm.
19.	Scriber 15 cm with scribing block universal
20.	Pick punch 15 cm 2nos.
21.	Drift punch copper 15 cm
22.	Centre punch 10 mm dia x 100 mm
23.	Chisel cold flat 20 mm
24.	Chisels Cross cut 200mm x 6 mm
25.	Hacksaw frame adjustable for 30 cm blade
26.	Drill Twist (assorted)
27.	Drill electric hand 6-12 mm
28.	Electric pedestal grinder with two wheel
29.	Electric Arc Welding Set
30.	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.
31.	Tachometer – to read up to 5000 rpm
32.	Mallets (Wooden/plastic)
33.	Ball peen Hammer 0.5 Kg.
34.	Cross peen Hammer 1 kg
35.	Spanner D E set of 12 pieces (6mm to 32 mm)
36.	Ring spanner set of 12 pieces (6mm to 32 mm.)
37.	Spanner, adjustable 20 cm.
38.	Spanner adjustable (pipe wrench) 350 mm
39.	Spanners socket of 8 with handles, T bar and ratchet
40.	Screw jack 1ton 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.	Triple leg grip puller with bearings attachment screw/hydraulic powered max. Spread 80,160,50,450 mm.
46.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
47.	Pulley puller disc type for pulley
48.	Oil extractor plant
49.	Feed Plant
50.	Soybean processing plant
51.	Peeler, Slicer & Chipper
52.	Sugarcane crusher

Level – II

- 1. Module name** : Repair, maintenance & field operation of Land shaping and Development Machinery.
- 2. Sector** : AGRICULTURAL SECTOR
- 3. Code** : AGR220
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age + AGR101 – 111 (Anyone of the courses)
- 5. Terminal competency** : Successful candidate would be able to carry out repair maintenance & field operation of Land shaping and Development Machinery.
- 6. Duration** : 150 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Practice health & safety select, use, maintain and store tools, equipments and clothing safety. ➤ Identify different components of Bulldozers, scrapers, diggers, dumpers terracer, laser, leveler etc . ➤ Practice in dismantle and assemble the Bulldozers, scrapers, diggers, dumpers terracer, laser, leveler etc. ➤ Check & repair the Bulldozers, scrapers, diggers, dumpers terracer, laser, leveler etc . ➤ Workshop adjustments of Bulldozers. ➤ Workshop adjustments scrapers, diggers, dumpers terracer, laser, leveler etc ➤ Driving practice of Tractor and Bulldozers. ➤ Operation and adjustment of Bulldozers. ➤ Operation of scrapers, diggers, dumpers terracer, laser, leveler etc. ➤ Field adjustment of scrapers, diggers, dumpers terracer, laser, leveler etc 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions and first aid ➤ Purpose of Bulldozers, scrapers, diggers, dumpers terracer, laser, leveler etc. ➤ Working Principal and Constructional details of Bulldozers. ➤ Working Principal and Constructional details of, scrapers, diggers, dumpers terracer, laser, leveler etc. ➤ Driving practice ➤ Workshop adjustment. ➤ Method of operation in field. ➤ Recommended Speed . ➤ Care and maintenance. ➤ Trouble shooting and remedies .

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.	Pliers round 15 cm
6.	Pliers flat nose 15 cm
7.	Pliers side cutting 15 cm
8.	Vice grip pliers.
9.	Circlip pliers Expanding and contracting type 15 cm and 20 cm each 8 sets.
10.	Hand file 20 cm. Second cut half round
11.	Hand file 30 cm bastard flat
12.	Hand file 30 cm bastard round
13.	Feeler gauge 20 blades (metric)
14.	Steel tool box with lock & key(folding type) size 400x200x150mm
15.	Allen Key set of 12 pieces (2mm to 14 mm)
16.	Philips Screw Driver Type set of 5 pieces 100 mm to 300 mm 04 Sets 34 Spanner, ring offset set
17.	Engineer's square 15 cm blade
18.	Divider spring joint 15 cm.
19.	Scriber 15 cm with scribing block universal
20.	Pick punch 15 cm 2nos.
21.	Drift punch copper 15 cm
22.	Centre punch 10 mm dia x 100 mm
23.	Chisel cold flat 20 mm
24.	Chisels Cross cut 200mm x 6 mm
25.	Hacksaw frame adjustable for 30 cm blade
26.	Drill Twist (assorted)
27.	Drill electric hand 6-12 mm
28.	Electric pedestal grinder with two wheel
29.	Electric Arc Welding Set
30.	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.
31.	Tachometer – to read up to 5000 rpm
32.	Mallets (Wooden/plastic)
33.	Ball peen Hammer 0.5 Kg.
34.	Cross peen Hammer 1 kg
35.	Spanner D E set of 12 pieces (6mm to 32 mm)
36.	Ring spanner set of 12 pieces (6mm to 32 mm.)
37.	Spanner, adjustable 20 cm.
38.	Spanner adjustable (pipe wrench) 350 mm
39.	Spanners socket of 8 with handles, T bar and ratchet
40.	Screw jack 1ton 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.	Triple leg grip puller with bearings attachment screw/hydraulic powered max. Spread 80,160,50,450 mm.
46.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
47.	Pulley puller disc type for pulley
48.	Bulldozer 120 HP
49.	Scraper
50.	Digger
51.	Dumper
52.	Terracer
53.	Laser leveler 750 m range
54.	Four wheel drive tractor(75 HP)with auxiliary hydraulic system
55.	Tractor 50 HP with power steering

Level – II

- 1. Module name** : **Custom Hiring of Agriculture Machinery**
- 2. Sector** : **AGRICULTURAL SECTOR**
- 3. Code** : **AGR221**
- 4. Entry Qualification** : Minimum 5th standard passed and 14 years of age
+ **AGR101 – 111 (Anyone of the courses)**
- 5. Terminal competency** : Successful candidate would be able to carry out Custom Hiring of Agriculture Machinery
- 6. Duration** : 150 hours

7. COURSE CONTENT:

Practical Competencies	Underpinning Knowledge(Theory)
<ul style="list-style-type: none"> ➤ Introduction to different Agriculture machinery. ➤ Selection of appropriate Tractor. ➤ Selection of Agriculture Machinery Equipments. ➤ Practice of field operation of Tractor with different Agriculture equipments for tillage. ➤ Practice of field operation of Tractor with different Agriculture equipments for sowing and planting. ➤ Practice of field operation of Tractor with different Agriculture equipments for harvesting. ➤ Periodical servicing of Tractor/Power Tiller and engine. ➤ Maintenance of Agriculture Machinery. ➤ Maintenance of Plant Protection and Irrigation equipments. ➤ Storage of Agriculture machinery in off-season. ➤ Method of maintaining lager book and Bank account. 	<ul style="list-style-type: none"> ➤ Knowledge on health & safety precautions and first aid. ➤ Procedure for obtaining loan from Bank. ➤ Procedure for obtaining subsidies from different Govt.& Non Govt. Agencies. ➤ Methods of selection of Tractor other Agriculture machinery. ➤ Importance of logs books. ➤ History sheet for maintaining Agriculture machinery. ➤ Workout requirements of different machinery. ➤ Survey on Farmer's field. ➤ Availability and source of machinery . ➤ Cash and credit purchase. ➤ Procedure for off-season storage. ➤ Cost of operation. ➤ Direct cost of labor and other machinery. ➤ Estimation of custom hiring rate. ➤ Maintenance of lager book and Bank account.

TOOLS & EQUIPMENTS

S.No.	Item
1.	Tractor with power steering 60 HP
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.	Bench Vice
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.	Scriber 15 cm with scribing block universal
15.	Pick punch 15 cm 2nos.
16.	Drift punch copper 15 cm
17.	Centre punch 10 mm dia x 100 mm
18.	Chisel cold flat 20 mm
19.	Chisels Cross cut 200mm x 6 mm
20.	Hacksaw frame adjustable for 30 cm blade
21.	Hand vice 37 mm
22.	Drill Twist (assorted)
23.	Drill electric hand 6-12 mm
24.	Electric pedestal grinder with two wheel
25.	Electric arc welding set portable
26.	Air Compressure
27.	Air Pressure Gauge
28.	Taps and Dies complete set in a box (metric) with handle.
29.	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.
30.	Copper Hammer
31.	Ball peen Hammer 0.5 Kg.
32.	Cross peen Hammer 1 kg
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.	Horses and wheel choke
39.	Screw jack 4 ton capacity double lift
40.	Oil can 0.5-liter cap
41.	Grease Gun Hand/Pneumatic
42.	Cleaning trays 45 x 30 cm.
43.	Stud remover.
44.	Work bench each 250 x 120 x 60 with 4 bench vices 12 cm jaw
45.	Pullers screw powered 2mm with bearing puller attachment.
46.	Bearing puller screw powered/hydraulic powered with attachments
47.	Ploughs MB (Augur type)
48.	Disc Plough (reversible)
49.	Disc Harrow tandem and off set
50.	Spike tooth harrow – Power harrow – Blade harrow
51.	Cultivator (shovel type and sweep type)
52.	Leveler – blade tracer
53.	Laser leveler
54.	Bund maker – Ridger - digger
55.	Seed-cum-fertilizer drill, strip drill, direct sowing drill
56.	Planter multi crop, potato, vegetable transplanter
57.	Fertilizer applicator
58.	Sprayer (Knapsack, Power Operated aero blast, self propelled high clearance)
59.	Rotary Duster
60.	Power weeder
61.	Centrifugal pump with motor/generater
62.	Reaper – Reaper binder
63.	Threshers for different crops
64.	Combine harvester axial flow for different crops

**Constitution of the Trade Committee for Agriculture Sector under SDI – MES
Scheme held at Ludhiana on 22nd 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	:	Land Scaping & Floriculture
Sector	:	Agriculture
Code	:	AGR129
Entry Qualification	:	10 th class pass
Age	:	15 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:

Practical	Theory
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. Common garden operations.	Different diseases and symptoms. Management of 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
A) Tools & Implements		
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) Farm Structures		
14.		
15.	Poly House with Misting Unit	01 no.
16.	Shed net house	01 no.
C) Farm Equipment		
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.
D) Miscellaneous Farm Supplies		
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 : **7th 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:

Practical	Theory
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 in mango	IPM in fruit cultivation. Organic fruit cultivation

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
24.	Watering Cans and Garden Sprayers	01 no

Level-I

Module No-III

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

CONTENTS:

Practical	Theory
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	Classification of seeds/ planting materials. Planting materials other than seeds: use of clones-suckers, roots, stems, búbils, rhizomes, corms, tubers etc
Identification of Land races, improved, composite, hybrids, hi-tech seeds	Classification of seeds: Land races, improved, composite, hybrids, hi-tech seeds
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, v. Post harvest guidance
Seed certification: Source verification, Field inspection: i. spacing, ii. Purity maintenance, iii. Rouging, iv. Diseases & pests, v. post harvest guidance	Seed processing, treatment, packaging & storing Seed Testing:
Seed processing, treatment, packaging & storing: Prctice on a. Sampling, b. Testing & Tagging, i.e. i. Purity – physical, ODV, ii. Germination iii. Moisture, iv. Disease & pests, v. standards Notified	Seed/Processing of production: Selection of crop / varieties. Seed processing, treatment, packing and storing. Seed testing: a. Sampling, b. Testing & Tagging, i.e. i. Purity – physical, ODV, ii. Germination, iii. Moisture, iv. Disease &

	pests, v. standards Notified
Visit to Nursery, Processing plant & Seed testing Laboratory	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.	Seed sample jars	20 nos
2.	Seed processing plant	01 no
3.	Sieves & Grader	01 set
4.	Gunny, poly packs & cloth bags	as required
5.	Seed treating drum	01 nos
6.	Seed sample drawers (Auger, winnower, cloth bag, tags & strings & seal)	01 set
7.	Germinator	01 no
8.	Incubator (Hand lence)	01 no
9.	Petridishes	10 nos
10.	Wts & measuring equipments	01 set
11.	Different country receptacles	05 nos
12.	Storage bins	01 no
13.	Stitching machines	01 no

Level -I

Module No-IV

Name : **Mushroom Cultivation**

Sector : **Agriculture**

Code : **AGR 132**

Entry Qualification : **5th 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>
<u>Selection and Processing of straw for bed preparation</u>	Knowledge of General Safety, health and hygiene Importance of Mushroom, scope, past, present status & future prospects.
Sterilization process practice	Pros & cons in Mushroom cultivation: why the Mushroom cultivation? Problems in mushroom cultivation & its remedies.
Preparation of beds for cultivation of various mushrooms and its maintenance	Mushroom for health: ingredients in mushroom, i.e. Protein, Carbohydrate, Fiber, Fat, Vitamins, Minerals etc.
Identification of viable Spawn	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
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-V

Name : **Apiary**
Sector : **Agriculture**
Code : **AGR 133**
Entry Qualification : 5th class pass
Age : 14 years and above

Terminal Competency :
After completion of the training trainees will be able to identify bee colonies, rearing in bee box and extracting honey

Duration : 120 hours

CONTENTS:

Practical	Theory
Familiarisation with species of honey bees & different types colony organization and bee boxes	Knowledge of General Safety, health and hygiene Concepts and Brief history of modern bee keeping. Honey bee as useful insects, species of honey bee, their nesting behaviour
Capturing bee colony from natural source	Relation between flowers & honey bees & their interdependence. Selection of Apiary side, important of bee resources & agricultural crops
Colony handling & inspection, maintenance of its record	Description of different types of bee boxes & equipments
Identify Enemies of bees, robbing fighting, cleaning of bee box & diseases	Mellifera bee keeping
Swarm control, colony division, queen cell, emergency cell	Seasonal bee management swarming & swarm control dividing, re-queening
Migration of colony, packing & mixing	Migration of bee box, dearth period & its control, Feeding. Honey bee pollination & its advantages
Use of bee equipments like queen gate, smoker, bee Vail, drone trap	Bee products – honey, bee wax, royal jelly, bee pollen & bee venom,
Honey extraction from bee box	Economics of bee keeping, financial assistance from KVIC, KVIB & Banks etc.
Preparation of comb, removal of old combs, fixing of comb foundation sheet	Bee keeping as hobby or commercial basis or semi commercial basis.
Manual Honey processing, quality control & storing of honey	Medicinal & food values of honey, granulations & farmantation of honey, their prevention & uses.
Extraction of bee wax & visit to local Apiaries	Qualiy concept and Agmark Certification.

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

Sl. No.	Item	Quantity
1.	Manual Extractor/4 Frame Radial Extractor	1 no.
2.	50 Kg / 100 kg Honey Tank with Filter - Stainless Steel	1 no.
3.	Uncapping Tray	1 no.
4.	Cold Uncapping Knife (Left)- Scalloped Edge - Stainless Steel /Cold Uncapping Knife (Right)- Stainless Steel	5 nos
5.	Honey Processor	1 set
6.	Tap Strainer - Stainless Steel	2 nos,
7.	Bee Box ISI A-Type (8 frame)	2 nos.
8.	Plunger Marking Cage, Press in Marking Cage, Clip Type Queen Cage, Queen Travelling and Introduction Cages	1 no
9.	Combined Veil and smoker	1 no each
10.	Pair of Leather Gloves	3 nos
11.	Contact Feeder, 4 liter capacity	10 nos
12.	Lightweight J-type Hive Tool	10 nos
13.	Queen Gate	20 nos
14.	Queen Excluder	3 nos
15.	Drone Trap	3 nos
16.	Fahrenheit Thermometer	02 nos.
17.	Steel container	03 nos
18.	Stove (Kerosene / Gas)	01 no.

Level -I

Module No-VI

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

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.
Exposure visit	
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)

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

Level -I

Module No-VII

Name : **Medicinal Plant**

Sector : **Agriculture**

Code : **AGR 135**

Entry Qualification : **8th 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:

Practical	Theory
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	Cultivation: 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.	Pest Management: 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.	Raw Material Resources & Collection, Primary Health Care & Herbs: 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)

Sl. No.	Item	Quantity
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-VIII

Name : **Agro forestry**
Sector : **Agriculture and Allied Sector**
Code : **AGR 136**
Entry Qualification : **7th class pass**
Age : **14 years and above**

Terminal Competency :
After completion of training the trainee will be able to :
• Set up agro forestry with minimum resources

Duration : **300 hours**

CONTENTS:

Practical	Theory
Selection of trees and crops	Knowledge of General Safety, health and hygiene. Introduction to Agro forestry. Origins of Agro forestry. Concept, principles, classification and advantages. Knowledge of non- timber forest products Improved Fallows in shifting cultivation Wind break and shelter belt. Crop Combinations with plantation crops, Taungya system Alley Cropping Principles of Resource Capture and Utilization of Light and Water Water Balance of Mixed Tree Crop Systems. Tree and crop combination with respect to edaphic and climatic conditions Biological aspects of agro forestry Nutrient Cycling and Soil Organic Matter, Nitrogen Fixation Root Distribution of Trees and Crops: Competition and/or Complementarities Silvicultural Management & productivity. Economic and Environmental Benefits of Agro forestry
Planting and Management of woodperenials and herbaceous plants	
Estimation of tree growth and development and cropping	
Biomass Production and estimation	
Demonstration on Tree-Crop underground and aboveground Interactions. Soil sampling and testing using soil testing kit.	
Planting design of various trees and crops growing together.	
Demostration of Shoot/Root Balance and Functional Equilibrium	
Raising of nursery and its management for agroforestry	
Identification of non- timber forest products	
Field Visits of different Agro forestry model	

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

	<u>Sl. No.</u>	<u>Item</u>	<u>Quantity</u>
1.		Windmills	01 no
2.		Garden tools	10 sets
3.		Log splitter	01 no
4.		Hygrometer	01 no
5.		Water pumps	01 no
6.		Bush cutter	01 no
7.		Folding shovel	01 no
8.		Harrows	05 no
9.		Moisture meter	01 no
10.		Soil testing kit	02 nos
11.		Root trainer	02 nos
12.		Root shear	02 nos

Level - I
Module No- IX

Name : **Vermiculturing and Vermicomposting**

Sector : **Agriculture**

Code : **AGR 137**

Entry Qualification : **5th 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:

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

Repetition of Techniques for confidence building	Vermicomposting
Visit to Vermicomposting Farm	Problems & prospects of Vermicomposting in India

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

Sl. No.	Item	Quantity
Ordinary Garden tools		
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

Practical	Theory
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 Use and store tools and equipments in a safe manner	Functions and uses of various tools, equipment and selection and correct use of tools and equipment for Cold Storage

<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) Preserve seasonal fruits and Vegetables using various methods Pack and label according to regulations 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 -II

Module No-I

Name	:	Gardeners
Sector	:	Agriculture
Code	:	AGR 239
Entry Qualification	:	8th class and completed Level-I Modules on Floriculture and Landscaping (AGR 129)
Age	:	18 years
Terminal Competency	:	on completion of the training, the trainees will be able to
		<ul style="list-style-type: none">Identify plants grow and develop a healthy gardens, nursery by proper landscaping.

Duration : 300 hours

CONTENTS:

Practical	Theory
Preparation of Nursery bed & raising seedlings of Fruits, Vegetables & Flowers	Knowledge of General Safety, health and hygiene Orchard Management: Horticulture as Industry in India, Principles of Establishment of Orchards, Method of plant propagation for Horticulture crops Vegetable & Spices Production: Package of practices for Vegetables Off-season vegetable cultivation & Tuber crops, Production of Exotic vegetables, Package of practices for Spices Ornamental Horticulture & Post Harvest Management: Principles of Landscaping, Identification & use of Ornamental Plants General Horticulture Techniques: Collection of soil sample for testing, Plant nutrients & hormones, Procedure for application of fertilisers & manures, Protected Cultivation – Green House, Shade Net House, Mulching, Nursery Management & Vegetable Seed Production: Principles of Nursery Management, Setting up of coconut nursery, Vegetable nursery & Ornamental nursery
Transplanting of Seedlings	
Layout of orchard, planting of fruit plants in the field	
Training & pruning of plants	
Grafting, Budding, Layering & Cutting	

Identification of different fruit plants & Ornamental plants	Ornamental Horticulture & Medicinal Plant Production: Commercial cultivation of Rose, Tuberose, Gladioli & Marigold, Preparation of Lawn & different Garden Structures
Preparation of Pot mixtures, potting & repotting of plants	
Layout & preparation of Lawn	
Pruning of shrubs, hedge, edge & topiary	
Flower arrangements- Preparation of bouquet & garlands	
Collection of soil samples for analysis	
Application of fertilizer in the field	
Identification of vegetable seeds, garden tools & implements	
Preparation of Bordeaux mixture	
Preparation of spray solution & handling sprayers & dusters	
Method of weed control	
Preparation of Jam, Jelly, Sauce & Pickles	
Farm Book Keeping: Maintenance of different records like Muster Roll, Production Register, Sale Register, Money Receipt	
Exposure visit to different nurseries, Farms, Research Station, Laboratories, Processing Units etc.	

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

Sl. No.	Item	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

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 Project Report, Presentation	Business Opportunity Guidance (BOG), Product Selection, Project Identification. All verity of 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><u>Cross occupational competency</u></p> <p>Development of Organizing and implementation of exercises/task</p> <ul style="list-style-type: none"> • Systematic approach • Accuracy • Efficient work • Carefulness • Planning & Organizing <p>Development of Communication & Cooperation</p> <ul style="list-style-type: none"> • Suitable behaviour towards customers • Influence in skill • Creativity in presentation & projection • Multi cultural skills <p>Development of mental technique</p> <ul style="list-style-type: none"> • Risk taking skill • Managing challenges • Ability to draw analogies • Thinking ahead • Ability to transfer • Creativity <p>Development of independency & responsibility</p> <ul style="list-style-type: none"> • Ability to make judgment • Reliability • Holding an opinion <p>Awareness of quality</p> <p><u>DEVELOPMENT OF OCCUPATIONAL COMPETENCY</u></p>	<p>Organizing and implementation of exercises</p> <p>Communication & Cooperation</p> <p>Learning methods and mental technique</p> <p>Independency & responsibility</p> <p>Different type of Leadership styles and</p>

<ul style="list-style-type: none"> • Leadership skills • Problem solving skills • Organising and Co-ordination skills • Critical thinkings • Decission Making 	creative leadership
Demonstration on different book keeping and accounting system.	Management Inputs: Book keeping & Accountancy, Working capital Management & Assessment, Marketing Management
	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 25th and 26th 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	Swapn 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, Balasroe	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, Balasroe	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,	Animal Husbandry Deptt.,	Member

	Chief Dev. Officer	Govt. of Orissa	
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, Badasdhi	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