



***National Curriculum Level-5 in Agricultural Machinery Technology***



**National Curriculum Level-5 in Agricultural Machinery Technology**

**“Agricultural Machinery Mechanic”**



**National Vocational and Technical Training Commission (NAVTTTC),**

**Government of Pakistan**



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### **ACKNOWLEDGEMENTS**

National Vocational and Technical Training Commission (NAVTTTC) extends its gratitude and appreciation to representatives of business, industry, academia, government agencies, provincial TEVTAs, sector skill councils and trade associations who spared time and extended their expertise for the development of National Vocational Qualification for the trade of **Agricultural Machinery Technology**. This work would not have been possible without the technical support of the above personnel.

NAVTTTC initiated development of CBT&A based qualifications for 200 traditional / hi-tech trades under the Prime **Minister's Hunarmand Pakistan Program**, focusing on Development & Standardization of 200 Technical & Vocational Education & Training (TVET) Qualifications. NAVTTTC efforts have received full support from the Ministry of Federal Education and Professional Training which highly facilitated progress under this initiative.

It may not be out of place to mention here that all the experts of Industry, Academia and TVET experts of TEVTAs, BTEs and PVTC work diligently for making this qualification worthy and error free for which all credit goes to them. However, NAVTTTC accepts the responsibility of all the errors and omissions still prevailing in the Qualification document.

It is also noteworthy that development of Skill Standards is a dynamic and ongoing process, and the developed skill standards needs periodic review and updating owing to the constant technological advancements, development in scientific knowledge, and growing experience of implementation at the grass root level as well as the demand of industry. NAVTTTC will ensure to keep the qualifications abreast with the changing demands of both national and international job markets.

**Executive Director (NAVTTTC)**



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### **Introduction**

#### **a. Definition/Description of training program (Agricultural Machinery Mechanic)**

Agriculture is an important sector of Pakistan's economy. This sector directly supports the country's population and accounts for 26 percent of gross domestic product (GDP). Agricultural machinery mechanics work with modern machinery. They assemble, adjust, operate, repair, maintain and test agricultural machinery. This machinery includes land preparation, tilling, sowing & planting, irrigating, spraying, harvesting, drying and equipment handling. They often supervise skilled mechanics and other workers who keep machines and systems operating at maximum efficiency.

#### **b. Purpose of the training program:**

The purpose of this qualification is to set the high professional standards for the Agricultural Machinery Mechanic. The specific objectives of developing these qualifications are as under:

- Improve the professional competence of the trainees
- Provide opportunities for recognition of the skills attained through formal or informal pathways
- Improve the quality and effectiveness of the training and assessment for Agricultural sector
- Enabling / helping / facilitating the existing workforce to indulge themselves in new technologies and methods

#### **c. Overall objectives of training program:**

The main objectives of the National Competency Standards Level-5 in Agricultural Machinery Technology “Agricultural Machinery Mechanic” are as follows:



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- Develop 2D CAD drawings
- Perform Oxy Acetylene Welding
- Operate Baler
- Maintain Baler
- Maintain Transmission System
- Maintain Hydraulic System
- Maintain pumps and tube wells
- Overhaul Engine
- Maintain pressurized irrigation system
- Maintain Grain Dryer
- Operate / Maintain Grain Thresher
- Operate / Maintain Sugar Cane Harvester
- Operate / Maintain Combine Harvester
- Apply management and communication techniques
- Conduct research for customer needs and satisfaction
- Create human resource management plan
- Develop entrepreneurial skills
- Develop project management plan
- Develop sales plan
- Identify and resolve problems
- Manage finances



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### **Competencies to be gained after completion of course:**

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

- Develop 2D CAD drawings
- Perform Oxy Acetylene Welding
- Operate Baler
- Maintain Baler
- Maintain Transmission System
- Maintain Hydraulic System
- Maintain pumps and tube wells
- Overhaul Engine
- Maintain pressurized irrigation system
- Maintain Grain Dryer
- Operate / Maintain Grain Thresher
- Operate / Maintain Sugar Cane Harvester
- Operate / Maintain Combine Harvester



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### d. Possible available job opportunities, available immediately and later in the future:

#### Possible Career paths

- Agricultural Machinery Helper
- Agricultural Machinery Operator
- Agricultural Machinery Technician
- Agricultural Machinery Mechanic

### e. Trainee entry level:

- The entry level for National Vocational Certificate Level 5 in Agricultural Machinery Technology “Agricultural Machinery Mechanic” is given below:

Title	Entry requirements
<ul style="list-style-type: none"><li>• National Vocational Certificate Level 5 in Agricultural Machinery Technology “Agricultural Machinery Mechanic”</li></ul>	<ul style="list-style-type: none"><li>• Entry for assessment for this qualification is open. However, entry into formal training institutes, based on this qualification is a candidate having National Vocational Certificate Level 4 in Agricultural Machinery Technology “<b>Agricultural Machinery Technician</b>”</li></ul>





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**f. Minimum qualification of trainer:**

- A. Must be a holder of DAE/Level 5 Diploma in Auto and Farm Machinery/ Agricultural Machinery Technology with at least 3 years relevant experience

**OR**

- B. B.Sc/B.E Agricultural Engineering

**g. Recommended trainer: trainee ratio**

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

**h. Medium of instruction i.e. language of instruction:**

Instructions will be in Urdu/ English/ Local language.



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### **i. Duration of the course (Total time, Theory & Practical time):**

The distribution of contact hours is given below:

**Total** - 1140 hours

**Theory** - 447 hours (39.2%)

**Practical** - 693 hours (60.8%)

**Proposed Course Duration** - 12 Months



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### **j. Sequence of modules:**

1. Develop 2D CAD drawings
2. Perform Oxy Acetylene Welding
3. Operate Baler
4. Maintain Baler
5. Maintain Transmission System
6. Maintain Hydraulic System
7. Maintain pumps and tube wells
8. Overhaul Engine
9. Maintain pressurized irrigation system
10. Maintain Grain Dryer
11. Operate / Maintain Grain Thresher
12. Operate / Maintain Sugar Cane Harvester
13. Operate / Maintain Combine Harvester
14. Apply management and communication techniques
15. Conduct research for customer needs and satisfaction
16. Create human resource management plan
17. Develop entrepreneurial skills
18. Develop project management plan
19. Develop sales plan
20. Identify and resolve problems
21. Manage finances



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### Summary template-overview of the curriculum:

Following is the structure of the course:

Sr No	Competency Standards	NVQ F Level	Category	Estimated Contact Hours			Cr Hr
				Th	Pr	Total	
Level-5 (Agricultural Machinery Mechanic)							
1. 1	Develop 2D CAD drawings	5	Technical	24	36	60	6
2.	Perform Oxy Acetylene Welding	5	Technical	36	48	84	8.4
3.	Operate Baler	5	Technical	6	6	12	1.2
4.	Maintain Baler	5	Technical	10	15	25	2.5
5.	Maintain Transmission System	5	Technical	40	60	100	10
6.	Maintain Hydraulic System	5	Technical	30	27	57	5.7
7.	Maintain pumps and tube wells	5	Technical	20	24	44	4.4
8.	Overhaul Engine	5	Technical	51	99	150	15
9.	Maintain pressurized irrigation system	5	Technical	30	24	54	5.4
10.	Maintain Grain Dryer	5	Technical	12	18	30	3
11.	Operate / Maintain Grain Thresher	5	Technical	24	36	60	6



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12.	Operate / Maintain Sugar Cane Harvester	5	Technical	56	78	134	13.4
13.	Operate / Maintain Combine Harvester	5	Technical	60	90	150	15
14.	Apply management and communication techniques	5	Generic	9	21	30	3
15.	Conduct research for customer needs and satisfaction	5	Generic	9	21	30	3
16.	Create human resource management plan	5	Generic	9	21	30	3
17.	Develop entrepreneurial skills	5	Generic	9	21	30	3
18.	Develop project management plan	5	Generic	9	21	30	3
19.	Develop sales plan	5	Generic	9	21	30	3
20.	Identify and resolve problems	5	Generic	9	21	30	3
21.	Manage finances	5	Generic	9	21	30	3
	<b>Total</b>			<b>447</b>	<b>693</b>	<b>1140</b>	<b>114</b>
	<b>Percentage (%)</b>			<b>39.2</b>	<b>60.8</b>		



## Detail of Modules

### Module: 1. Develop 2D CAD Drawings

**Objective:** After the completion of this module the Trainee will be able to Develop and prepare 2D objects.

**Duration:** 60 Hours

**Theory:** 24 Hours

**Practice:** 36 Hours

**Credit Hours:** 6

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  <b>Develop 2D Objects</b>	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Setup the drawing interfaces for the required specifications</li> <li>Setup the user interface settings for the required specifications</li> <li>Save the CAD drawing files in various file formats such as DWG, PDF, and JPG.</li> <li>Create the 2D Objects with the given measurements</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>Explain Drawing Interfaces</li> <li>Explain the 2D Drawings</li> <li>Explain the circle, Lines, Radius, Diameter and circumference</li> <li>Describe the steps in CAD also how to save the CAD in different file formats</li> </ul>	          Theory-12 Hrs Practical-24Hrs Total- 36 Hrs	<ul style="list-style-type: none"> <li>Computer with all accessories</li> <li>Engineering CAD software</li> <li>Physical Models/ Prototype</li> </ul>	Lab



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		<b><u>Practical Activity:</u></b> <ul style="list-style-type: none"> <li>• Draw oblique drawing</li> <li>• Draw axonometric drawing</li> <li>• Draw perspective drawing</li> <li>• Draw multi view drawing</li> <li>• Draw plan of projection</li> <li>• Draw projection drawing</li> <li>• Draw multi view drawing of machine equipment</li> </ul>			
<b>LU2. Prepare Final Set of 2D Drawings</b>	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Use an appropriate command and tools to develop the 2D Drawing</li> <li>• Develop a 2D Drawing with the given project specifications and measurements</li> </ul>	<b>Knowledge Based Questions</b>  <b><u>Theory:</u></b> <ul style="list-style-type: none"> <li>• Types of Array</li> <li>• offset, circle and rotate short commands</li> <li>• Zooming options</li> </ul> Tools palettes window	Theory-12Hrs  Practical-12Hrs  Total-24 Hrs		Class Room  Training Workshop  Lab/ Field Visit



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	<ul style="list-style-type: none"> <li>Create a title block layout as required</li> <li>Plot drawing on scale according to required size and orientation</li> </ul>	<b><u>Practical Activity:</u></b> <ul style="list-style-type: none"> <li>Draw Lines and Circles in CAD Software.</li> <li>Draw Different Types of Triangles in CAD Software.</li> </ul>			
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### Module: 2. Perform Oxy Acetylene Welding

**Objective:** After the completion of this module the Trainee will be able to Practice of making Tee Joint, Practice of making Lap Joint and Practice of Making Butt Joint.

**Duration: 84 Hours**

**Theory: 36 Hours**

**Practice: 48 Hours**

**Credit Hours: 8.4**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Practice of Tee making Joint	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Take Work piece as per drawing</li> <li>Straiten it with the help of hammer and anvil</li> </ul>	<b>Knowledge Based Questions</b>  <b><u>Theory:</u></b>	Theory-18 Hrs Practical-24 Hrs Total- 42 Hrs	<ul style="list-style-type: none"> <li>PPEs</li> <li>Oxygen cylinder</li> <li>Acetylene gas cylinder</li> <li>Pressure regulators</li> </ul>	Training Workshop





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	<ul style="list-style-type: none"> <li>• Grind the work pieces on grinding machine to prepare the edges flat and parallel to each other</li> <li>• Place the Bottom piece on work table and place the Top plate at 90° to each other as per drawing</li> <li>• Set the flame of welding torch as per standard</li> <li>• Complete the bead as per standard</li> </ul>	<ul style="list-style-type: none"> <li>• Explain positions of electrode according to work</li> <li>• Knowledge of setting the current on welding machine</li> <li>• Describe motion of electrode in ARC welding</li> <li>• Explain importance of gap between electrode and base metal</li> <li>• Describe use of tri square</li> <li>• Describe importance of cleanliness of surface to be welded.</li> <li>• Describe the preheating process</li> </ul>		<ul style="list-style-type: none"> <li>• Cylinder key</li> <li>• Welding torch</li> <li>• Rubber house pipe</li> <li>• Back fire arrester</li> <li>• Flash back arrester</li> <li>• Job material</li> </ul>	
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		<b><u>Practical Activity:</u></b>  Grind the work pieces on grinding machine to prepare the edges flat and parallel to each other  <ul style="list-style-type: none"> <li>• Set the flame of welding torch as per standard</li> <li>• Make the Tee Joint.</li> <li>•</li> </ul>			
<b>LU2.</b> Practice of Making Butt Joint	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Take Work piece as per drawing</li> <li>• Straiten it with the help of hammer and anvil</li> <li>• Grind the work pieces on grinding machine to prepare the edges flat and parallel to each other</li> <li>• Place the work pieces parallel to each other</li> </ul>	<b>Knowledge Based Questions</b>  <b><u>Theory:</u></b> <ul style="list-style-type: none"> <li>• Explain positions of electrode according to work</li> <li>• Knowledge of setting the current on welding machine</li> <li>•</li> </ul>	Theory-18Hrs  Practical-24Hrs  Total-42Hrs	<ul style="list-style-type: none"> <li>• PPEs</li> <li>• Oxygen cylinder</li> <li>• Acetylene gas cylinder</li> <li>• Pressure regulators</li> <li>• Cylinder key</li> <li>• Welding torch</li> <li>• Rubber house pipe</li> <li>• Back fire arrester</li> <li>• Flash back arrester</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"><li>Set the flame of welding torch as per standard</li></ul>	<p>Describe the surface preparation process</p> <p><b><u>Practical Activity:</u></b></p> <p>Grind the work pieces on grinding machine to prepare the edges flat and parallel to each other</p> <ul style="list-style-type: none"><li>Set the flame of welding torch as per standard</li><li>Make the Tee Joint.</li><li>Make Butt Joint</li><li>Describe motion of electrode ARC</li></ul>			
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### Module: 3. Operate Baler

**Objective:** After the completion of this module the Trainee will be able to operate baler and its working, Operations.

**Duration:** 12 Hours

**Theory:** 06 Hours

**Practice:** 06 Hours

**Credit Hours:** 1.2

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b> Ensure Safety while operating baler	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Select appropriate PPEs</li> <li>Wear PPEs</li> <li>Interpret Warning signs</li> </ul>	<b>Knowledge based questions</b>  <b>Theory</b> <ul style="list-style-type: none"> <li>Describe the function of knotting system</li> </ul> <b>Practical Activity:</b> <ul style="list-style-type: none"> <li>Identify major types of baler</li> <li>List down various components of Baler</li> <li>Define major baler operations</li> </ul>	Theory-02 Hrs  Practical-03 Hrs  Total- 05 Hrs	<ul style="list-style-type: none"> <li>Balers</li> <li>PPEs</li> <li>Tractor</li> </ul>	Field
<b>LU2.</b> Identify Types Of Baler	<b>Trainee will be able to:</b>	<b>Knowledge Based Questions</b>	Theory-02Hrs	<ul style="list-style-type: none"> <li>Different baler</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>Identify major types of baler</li> <li>Identify major components of baler</li> <li>Identify best baler for required crop</li> </ul>	<p><b><u>Theory:</u></b></p> <ul style="list-style-type: none"> <li>Described the main differences of Horizontal and Vertical Balers.</li> </ul> <p><b><u>Practical Activity</u></b></p> <ul style="list-style-type: none"> <li>Identify major types of baler in Vertical /Horizontal) PTO Drive shaft ( Select shaft according to tractor)</li> </ul>	<p>Practical-00Hrs</p> <p>Total-02 Hrs</p>		
<p><b>LU3.</b></p> <p>Perform Baler Applications</p>	<ul style="list-style-type: none"> <li>Select Baler type (crop)</li> <li>Identify the baler for required crop</li> <li>Interpret post-harvest losses</li> <li>Select shaft according to tractor (PTO driven shaft)</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><b><u>Theory:</u></b></p> <ul style="list-style-type: none"> <li>Describe the safety measures in baler operations</li> </ul> <p><b><u>Practical Activity:</u></b></p>	<p>Theory-02Hrs</p> <p>Practical-03Hrs</p> <p>Total-05 Hrs</p>	<ul style="list-style-type: none"> <li>Different baler</li> </ul>	Field



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	<ul style="list-style-type: none"> <li>Adjust RPM according to machine requirement (540)</li> <li>Check Required ropes and adjust bale size</li> </ul>	<ul style="list-style-type: none"> <li>List down various components of Baler</li> <li>Define major baler operations</li> </ul>			
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### Module: 4. Maintain Baler

**Objective:** After the completion of this module the Trainee will be able to Maintain Transmission System.

**Duration: 25 Hours**

**Theory: 10 Hours**

**Practice: 15 Hours**

**Credit Hours: 2.5**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Hitch of baler	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Align the 3 point hitch system with the baler</li> <li>Hitch the Baler</li> <li>Select capacity of baler as per field operations</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>Describe the hitching process of baler</li> </ul> <u><b>Practical Activity:</b></u> <ul style="list-style-type: none"> <li>Check timing of sickle assembly</li> <li>Adjust Bale Tension manually</li> </ul>	Theory-04Hrs  Practical-03 Hrs  Total- 07 Hrs	<ul style="list-style-type: none"> <li>Baler</li> <li>tractor</li> </ul>	Field



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<b>LU2.</b>  Trouble shoot Baler Problems	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Check Bill hook tension</li> <li>• Check baler RPM</li> <li>• Check sharp edges around knotter</li> <li>• Check sharpness of knife</li> <li>• Check Hydraulic pump performance</li> <li>• Check high pressure pipe and line</li> <li>• Check lifting jack seals</li> <li>• Check timing of sickle assembly</li> <li>• Check knotter assembly</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>• Interpret the periodic maintenance chart of baler</li> </ul> <u><b>Practical Activity:</b></u> <ul style="list-style-type: none"> <li>• Check hydraulic fluid in hydraulic system</li> <li>• Check the any leakage of hydraulic system</li> <li>• Air bleed from hydraulic system</li> <li>• Adjust Bale Tension manually</li> </ul>	          Theory-03Hrs Practical-06Hrs Total-09Hrs	<ul style="list-style-type: none"> <li>• PPEs</li> <li>• Combination plier</li> <li>• Screw driver set</li> <li>• Open end Spanner set</li> <li>• Special Tool(Baler)</li> <li>• Oil Can</li> <li>• Air compressor</li> <li>• Service nozzle</li> <li>• Grease gun</li> </ul>	Training Workshop  Field
<b>LU3.</b>  Service of Baler	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Clean it with air pressure</li> <li>• Lubricating Greece nipples</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory:</b></u>	Theory-03 Hrs Practical-06 Hrs	<ul style="list-style-type: none"> <li>• PPEs</li> <li>• Combination plier</li> <li>• Screw driver set</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>• Adjust its clutch</li> <li>• Lubricate sickle assembly</li> <li>• Adjust picking bars</li> <li>• Tightening of nuts and bolts with required torque</li> <li>• Adjust Bale Tension manually</li> </ul>	<ul style="list-style-type: none"> <li>• Define Baler maintenance</li> <li>• Described the total Torque of required for tightening</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ul style="list-style-type: none"> <li>• Inject the Grease in grease nipples with the help of Grease gun.</li> <li>• Adjust the picking bars as per manual</li> </ul>	Total- 09 Hrs	<ul style="list-style-type: none"> <li>• Open end Spanner set</li> <li>• Special Tool(Baler)</li> <li>• Oil Can</li> <li>• Air compressor</li> <li>• Service nozzle</li> <li>• Grease gun</li> </ul>	
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Service the clutch assembly	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Park the Prime Mover on level surface</li> <li>• Place the line jacks</li> <li>• Disconnect the electrical connections</li> <li>• Open the bolts of transmission and engine assembly</li> <li>• Split the Prime Mover</li> <li>• Bolt the clutch assembly for dis-engagement</li> <li>• Install the clutch centralizer</li> <li>• Open the clutch assembly mounting bolts</li> </ul>	<b>Knowledge Based Questions</b>  <b><u>Theory:</u></b> <ul style="list-style-type: none"> <li>• Define Clutch System</li> <li>• Define the types of clutch</li> <li>• Define Dual benefits of dual type of clutch</li> <li>• Explain the purpose of friction plate.</li> <li>• Define the purpose of pressure plate system in clutch system.</li> </ul> <b><u>Practical Activity:</u></b>	Theory-08 Hrs  Practical-12 Hrs  Total- 20 Hrs	<ul style="list-style-type: none"> <li>• Special Service Tools of Gear Box</li> <li>• Spanner set</li> <li>• Combination plier</li> <li>• Tractor</li> <li>• Clutch assembly</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>Assemble the Clutch assembly</li> </ul>	<ul style="list-style-type: none"> <li>Dissembled the transmission from engine as per manual instructions</li> <li>Check and inspect the all electrical connection and their harness</li> <li>Inspect the gear assembly</li> <li>Install the clutch centralizer and assembled the clutch assembly</li> </ul>			
<b>LU2.</b>  Replace the PTO Clutch Plate	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Park the Prime Mover on level surface</li> <li>Place the line jacks</li> <li>Disconnect the electrical connections</li> <li>Open the bolts of transmission and engine assembly</li> </ul>	<b>Knowledge Based Questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>What the stand for PTO.</li> <li>Explain the gear in PTO</li> </ul> Explain types of Bearing	Theory-08 Hrs  Practical-12 Hrs  Total- 20 Hrs	<ul style="list-style-type: none"> <li>Special Service Tools of Gear Box</li> <li>Spanner set</li> <li>Combination plier</li> <li>Tractor</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>Split the Prime Mover</li> <li>Bolt the clutch assembly for dis-engagement</li> <li>Install the clutch centralizer</li> <li>Open the clutch assembly mounting bolts</li> <li>Remove the pins and locks of Release levers</li> <li>Remove the Bolts</li> <li>Replace the PTO Clutch plate</li> <li>Assemble the Clutch Assembly</li> <li>Assemble the Prime Mover assembly</li> </ul>	<b><u>Practical Activity:</u></b> <ul style="list-style-type: none"> <li>Remove the PTO Shaft front bearing</li> <li>Lift out the PTO constant mesh gear.</li> <li>Remove the epicycle reduction gear box</li> <li>Remove the front main shaft with bearing</li> </ul>			
<b>LU3.</b>  Maintain The Gear Box Assembly	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Park the Prime Mover on level surface</li> <li>Place the line jacks</li> <li>Disconnect the electrical connections</li> </ul>	<b>Knowledge based questions</b>  <b><u>Theory:</u></b> <ul style="list-style-type: none"> <li>What the stand for PTO.</li> <li>Explain the gear in PTO</li> </ul>	Theory-08 Hrs  Practical-12 Hrs  Total- 20 Hrs	<ul style="list-style-type: none"> <li>Special Service Tools of Gear Box</li> <li>Spanner set</li> <li>Combination plier</li> <li>Tractor</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>• Open the bolts of transmission and engine assembly</li> <li>• Split the Prime Mover</li> <li>• Open the center housing to gear box bolts</li> <li>• Remove the clutch paddle and brake paddle with shafts</li> <li>• Remove the retainer assembly</li> <li>• Remove the cover plate of cover shaft</li> <li>• Remove the EP cyclic gear reduction unit</li> <li>• Remove the shifting rails and forks</li> <li>• Remove the locks and pull the Main shaft</li> <li>• Remove PTO drive shaft from counter drive shaft</li> <li>• :Remove lock of counter shaft</li> <li>• Assemble the Gear box appropriately</li> </ul>	<ul style="list-style-type: none"> <li>• Explain types of Bearing</li> <li>• Describe the different types of gears according to teeth</li> <li>• How many types of bearing are used in gear box</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ul style="list-style-type: none"> <li>• Remove the planet and ring gear</li> <li>• Remove the bearing cone using an external bearing puller</li> <li>• Place the dismounted wheel on the workshop floor</li> <li>• Fit the outer main gear seal</li> </ul>			
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	<ul style="list-style-type: none"> <li>Filed test the accuracy of gearbox</li> </ul>				
<b>LU4.</b>  Maintain Pinion Of Rear Axel	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Park the Prime Mover on level surface</li> <li>Place the line jacks</li> <li>Disconnect the electrical connections</li> <li>Disconnect the brake linkages</li> <li>Open the bolts of transmission and center housing</li> <li>Split the Rear Axel</li> <li>Remove the Nuts &amp; Bolts from center housing to Axel housing</li> <li>Split the Left side Axel housing</li> <li>Remove Bolts of Pinion Assembly</li> <li>Remove the Pinion</li> </ul>	<b>Knowledge based questions</b>  <b><u>Theory:</u></b> <ul style="list-style-type: none"> <li>How does the reduction gear works</li> </ul> <b><u>Practical Activity:</u></b> <ul style="list-style-type: none"> <li>Using a micrometer to measures the thickness of gear gap</li> <li>Carefully insert the rear axle through the axle out seal</li> <li>For Heavy Duty axle the seal must be driven flush with outer housing.</li> </ul>	Theory-08 Hrs  Practical-12 Hrs  Total- 20 Hrs	<ul style="list-style-type: none"> <li>Special Service Tools of Gear Box</li> <li>Spanner set</li> <li>Combination plier</li> <li>Tractor</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>Fasten the assembly on bench vice</li> <li>Remove the locking pin &amp; locking nut</li> <li>Remove the bearing &amp; Sleeve</li> <li>Clean the assembly parts with kerosene oil</li> <li>Reassemble the Pinion Assembly as per standard procedure</li> <li>Preloading of pinion assembly</li> <li>Install the pinion assembly as per standard procedure</li> </ul>	<ul style="list-style-type: none"> <li>Ensure the ring gear is correctly fitted with the teeth in full engagement.</li> </ul>			
<b>LU5.</b>  Maintain Differential Case Of Rear Axel	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Park the Prime Mover on level surface</li> <li>Place the line jacks</li> <li>Disconnect the electrical connections</li> <li>Disconnect the brake linkages</li> </ul>	<b>Knowledge based questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Explain the purpose of differential lock, O rings and axle shaft splines</li> </ul>	Theory-08 Hrs  Practical-12 Hrs  Total- 20 Hrs	<ul style="list-style-type: none"> <li>Special Service Tools of Gear Box</li> <li>Spanner set</li> <li>Combination plier</li> <li>Tractor</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>• Open the bolts of transmission and center housing</li> <li>• Split the Rear Axel</li> <li>• Remove the Nuts &amp; Bolts from center housing to Axel housing</li> <li>• Split the Left side Axel housing</li> <li>• Remove the differential case</li> <li>• Remove the differential case bearing</li> <li>• Remove the bolts of differential case</li> <li>• Remove the planetary gear and thrust washers</li> <li>• Remove the nut &amp; bolt of crown wheel and differential case</li> <li>• Clean the parts with kerosene oil</li> <li>• Reassemble the Crown wheel and differential</li> </ul>	<ul style="list-style-type: none"> <li>• Why important the Torque for the tightening the nuts and bolts.</li> <li>• Explain the purpose of Left and right carrier plate</li> <li>• Define the Shims</li> <li>• Define the Feeler Gauge</li> <li>• Define Nuts and Bolts</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ul style="list-style-type: none"> <li>• Using a hydraulic press, drive the epicyclical hub onto the wheel axle.</li> <li>• Refit the inner bearing cup in the trumpet housing</li> <li>• Using new cork gasket, refit the ring gear, refit the ring gear and outer gear</li> </ul>			
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	<p>case Assembly as per standard procedure</p> <ul style="list-style-type: none"><li>• Assemble the Axel Housing as per standard procedure</li></ul>	<ul style="list-style-type: none"><li>• Tighten the nuts progressively and evenly to a torque as specified.</li></ul>			
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## Module: 6. Maintain Hydraulic System

**Objective:** After the completion of this module the Trainee will be able to Maintain Hydraulic System

**Duration:** 57 Hours

**Theory:** 30 Hours

**Practice:** 27 Hours

**Credit Hours:** 5.7

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU 1.</b>  Service the Hydraulic pump	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Park the Prime Mover on level surface</li> <li>• Place the line jacks</li> <li>• Split the Prime Mover from gear box and central hosing</li> <li>• Remove the stand pipe</li> <li>• Remove both mounting Dowels</li> <li>• Remove the Hydraulic pump</li> </ul>	<b>Knowledge Based Questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>• Knowledge of Hydraulic Pump</li> <li>• Enlist Components of Hydraulic Pump</li> <li>• Describe the Pascal law</li> </ul> <b>Practical Activity:</b>	Theory-08 Hrs  Practical-06 Hrs  Total- 14 Hrs	<ul style="list-style-type: none"> <li>• PPEs</li> <li>• Combination plier</li> <li>• Screw driver(FLAT)</li> <li>• Screw driver (Philip)</li> <li>• Open end Spanner set</li> <li>• Special Tool(Baler)</li> <li>• Oil Can</li> <li>• Air compressor</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"><li>• Remove Hydraulic strainer</li><li>• Remove the suction manifold</li><li>• Remove the drive end plate</li><li>• Remove the drive shaft</li><li>• Clean the Hydraulic pump with kerosene oil</li><li>• Replace the chamber valve kit &amp; piston rings</li><li>• Place the rubber O-rings</li><li>• Assemble the Hydraulic Pump</li><li>• Check the pump pressure with appropriate tools and gauges</li></ul>	<ul style="list-style-type: none"><li>• Replace the piston rings of hydraulic pump</li></ul>		<ul style="list-style-type: none"><li>• Service nozzle</li><li>• Grease gun</li><li>• Tractor</li></ul>	
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LU2.		Trainee will be able to:	Knowledge Based Questions			Training Workshop
Service Hydraulic Cover	The Top	<ul style="list-style-type: none"> <li>Remove the linkages</li> <li>Open the bolts of hydraulic top cover</li> <li>Disassemble the ram cylinder nuts</li> <li>Remove the vertical lever</li> <li>Remove the lift arms</li> <li>Disconnect the draft control linkages</li> <li>Disconnect the Position control linkages</li> <li>Remove the arm shaft</li> <li>Clean the assemble with kerosene oil</li> <li>Assemble the Hydraulic Top cover</li> </ul>	<p><b>Theory:</b></p> <ul style="list-style-type: none"> <li>What the stand for SST</li> <li>Define the working principal Hydraulic System</li> <li>Explain the importance of Air Bleed in hydraulic system.</li> <li>Describe the name of quadrant levers</li> </ul> <p><b>Practical Activity:</b></p> <ul style="list-style-type: none"> <li>Remove the control beam</li> <li>Remove the standpipe cap and standpipe</li> <li>Hinge back the lift cover</li> </ul>	<p>Theory-08 Hrs</p> <p>Practical-06 Hrs</p> <p>Total- 14 Hrs</p>	<ul style="list-style-type: none"> <li>PPEs</li> <li>Combination plier</li> <li>Screw driver set</li> <li>Open end Spanner set</li> <li>Special Tool(Baler)</li> <li>Oil Can</li> <li>Air compressor</li> <li>Service nozzle</li> <li>Grease gun</li> <li>tractor</li> </ul>	



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		<ul style="list-style-type: none"> <li>Drain the oil to the LOW point</li> </ul>			
<b>LU3.</b>  Adjust The Draft Control	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Adjust the Quadrant</li> <li>Adjust the control lever position on quadrant</li> <li>Adjust the position control lever on transport position</li> <li>Adjust the Draft control lever on sector mark</li> <li>Adjust vertical lever on right angle</li> <li>Tight the nut and lock</li> <li>Check the adjustment during field operation</li> </ul>	<b>Knowledge Based Questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Describe the quadrant location</li> </ul> <b>Practical Activity:</b> <ul style="list-style-type: none"> <li>Adjust the quadrant</li> </ul>	Theory-08Hrs  Practical-06 Hrs  Total- 14 Hrs	<ul style="list-style-type: none"> <li>PPEs</li> <li>Combination plier               <ul style="list-style-type: none"> <li>Screw driver set</li> </ul> </li> <li>Open end Spanner set</li> <li>Special Tool(Baler)</li> <li>Oil Can</li> <li>Air compressor</li> <li>Service nozzle</li> <li>Grease gun</li> <li>Tractor</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



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<p><b>Lu4.</b></p> <p>Adjustment Of Position Control Lever</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>Place the control lever on position control</li> <li>Place the draft control lever on up position</li> <li>Tight the Allen screw until vertical lever places on right angle</li> <li>Check nut or lock</li> <li>.Check the adjustment during field operation</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>Convert Bars into lbf/inc-2</li> <li>Conversation of F into C</li> <li>How to read the gauge procedure</li> </ul> <p><u><b>Practical Activity:</b></u></p> <ul style="list-style-type: none"> <li>Slacken the draft control quadrant mounting bolts</li> <li>Tighten the quadrant mounting and bolts and re check the natural setting</li> <li>Start the engine and operate at 1200 RPM.</li> </ul>	<p>Theory-06Hrs</p> <p>Practical-09Hrs</p> <p>Total- 15 Hrs</p>	<ul style="list-style-type: none"> <li>PPEs</li> <li>Combination plier <ul style="list-style-type: none"> <li>Screw driver set</li> </ul> </li> <li>Open end Spanner set</li> <li>Special Tool(Baler)</li> <li>Oil Can</li> <li>Air compressor</li> <li>Service nozzle</li> <li>Grease gun</li> <li>Tractor</li> </ul>	<p>Training workshop</p>
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## Module: 7. Maintain Pumps And Tube Wells

**Objective:** After the completion of this module the Trainee will be able to Maintain Pumps and Tube Wells.

Duration: 44 Hours

Theory: 20 Hours

Practice: 24 Hours

Credit Hours: 4.4

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b> Identify Pumps And Tube Wells	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Identify different types of pumps and tube wells.</li> <li>Identify the major components of pumps and tube wells.</li> <li>Identify the prime mover for pump and tube well.</li> <li>Identify the water table depth</li> </ul>	<b>Knowledge Based Questions</b> <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>Explain the pump types</li> </ul> <u><b>Practical Activity:</b></u> <ul style="list-style-type: none"> <li>Indicate the pumps type</li> <li>Inspect the every pumps parts be carefully</li> </ul>	Theory-07 Hrs Practical- 06Hrs Total- 13 Hrs	<ul style="list-style-type: none"> <li>PPEs</li> <li>Combination plier</li> <li>Screw driver set</li> <li>Open end Spanner set</li> <li>Special Tool(Baler)</li> <li>Oil Can</li> <li>Air compressor</li> <li>Service nozzle</li> <li>Grease gun</li> <li>Different pumps</li> </ul>	Training Workshop



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		<ul style="list-style-type: none"> <li>Check the water level</li> </ul>			
<b>LU2.</b>  Operate Pumps And Tube Well	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Interpret safety precautions regarding pumps and tube wells.</li> <li>Adjust the rpm of Prime Mover as per manufacturer guidelines</li> <li>Engage clutch for smooth startup of the pump</li> <li>Adjust RPM of the prime mover to deliver optimum discharge</li> </ul>	<b>Knowledge Based Questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Explain types of in pump system</li> <li>Define the how many RPM operation after maintenance</li> </ul> <b>Practical Activity:</b> <ul style="list-style-type: none"> <li>Adjust the RPM of the prime mover to discharge.</li> <li>Adopt the safety precaution as PPE;s</li> </ul>	Theory-07Hrs  Practical-09Hrs  Total-16Hrs	<ul style="list-style-type: none"> <li>PPEs</li> <li>Combination plier</li> <li>Screw driver set</li> <li>Open end Spanner set</li> <li>Special Tool(Baler)</li> <li>Air compressor</li> <li>Hammer</li> <li>Different Pumps</li> </ul>	Training Workshop



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<b>LU3.</b>	<b>Trainee will be able to:</b>	<b>Knowledge Based Questions</b>			
Maintain pumps and tube wells	<ul style="list-style-type: none"> <li>• Check drive belts and pulleys</li> <li>• Open the impeller housing</li> <li>• Remove the shaft and impeller</li> <li>• Check the impeller and shaft condition</li> <li>• Remove the bearing with special tool</li> <li>• Insert new joint kit</li> <li>• Re-assemble the pump</li> <li>• Lubricate the lubricant points.</li> </ul>	<p><b>Theory:</b></p> <ul style="list-style-type: none"> <li>• Explain types of pulleys</li> </ul> <p><b>Practical Activity:</b></p> <ul style="list-style-type: none"> <li>• Adjust the pulleys tension as per specification</li> <li>• Used Puller for remove the shaft and bearing</li> </ul>	<p>Theory-06 Hrs</p> <p>Practical-09 Hrs</p> <p>Total- 15 Hrs</p>	<ul style="list-style-type: none"> <li>• PPEs</li> <li>• Combination plier</li> <li>• Screw driver set</li> <li>• Open end Spanner set</li> <li>• Special Tool(Baler)</li> <li>• Air compressor</li> <li>• Hammer</li> <li>• Different pumps</li> <li>• Pulleys</li> <li>• keys</li> </ul>	Training Workshop





## Module: 8. Overhual Engine

**Objective:** After the completion of this module the Trainee will be able to Overhaul Engine.

**Duration:** 150 Hours

**Theory:** 51 Hours

**Practice:** 99 Hours

**Credit Hours:** 15

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b> Remove The Accessories From Engine	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Park the tractor on level surface</li> <li>• Disconnect the battery terminal</li> <li>• Disconnect the fuel supply system</li> <li>• Disconnect the cooling system</li> <li>• Disconnect the lubrication system</li> <li>• Disconnect the front axle from engine</li> <li>• Disconnect engine from clutch or Transmission housing</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>• Explain the types of engine according Cooling system</li> <li>• Explain the engine types according cylinder</li> </ul> <u><b>Practical Activity:</b></u> <ul style="list-style-type: none"> <li>• Remove the Region bolts be carefully</li> </ul>	Theoy-05 Hrs Practical- 09Hrs Total- 14 Hrs	<ul style="list-style-type: none"> <li>• Prime mover/Engine</li> <li>• SST</li> <li>• All Required Tools</li> <li>• Engine Crane Jack</li> <li>• Pneumatic Gun with Air Compressor</li> <li>• Tool Try</li> <li>• Spare Parts Try</li> <li>• Oil Cane</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>• .Separate engine from Tractor</li> </ul>	<ul style="list-style-type: none"> <li>• Clean and wash the radiator must be before the re assembled</li> <li>• Aligned the all engine attachments</li> <li>• Use crane jack for remove the tractor</li> <li>• Drain the Gear and engine oil before the dissembled</li> </ul>			
<b>LU2.</b>  Dismantle Cylinder Head Assembly	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Place the engine level surface</li> <li>• Disconnect the intake manifold</li> <li>• Disconnect the exhaust manifold</li> <li>• Disconnect the cylinder head cover</li> <li>• Disconnect the timing gear assembly</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>• Explain the types of Piston</li> <li>• Define Piston Material</li> <li>• Explain the piston skirt</li> </ul> <u><b>Practical Activity:</b></u>	Theory-04 Hrs  Practical-09Hrs  Total-13 Hrs	<ul style="list-style-type: none"> <li>• SST for Engine</li> <li>• Torque Wrench</li> <li>• Hexagonal Socket as per requirements</li> <li>• Mains Mechanic Tools</li> <li>• Prime Mover/Engine</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>• Disconnect the cylinder head cover</li> <li>• Dismantle or open the bolt of cylinder head from cylinder block</li> <li>• Remove the cylinder head from cylinder block</li> <li>• Place the cylinder head proper place</li> <li>• Disconnect the rocker arm assembly from cylinder head</li> <li>• Disconnect the valve spring with valve spring compressor</li> <li>• Remove the valve from cylinder head</li> <li>• Perform the operation of Warpage</li> </ul>	<ul style="list-style-type: none"> <li>• Inspect the head gasket before the overhaul the cylinder head and engine block</li> <li>• Inspect the main big end bearings</li> <li>• Inspect the crank shaft, piston and their rings be carefully</li> </ul>			
<b>Lu3.</b>  Dismantle The Oil Pan	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Drain the oil from oil pan</li> <li>• Dismantle the oil pan bolts</li> <li>• Dismantle oil pan</li> </ul>	<b>Knowledge Based Questions</b>  <u>Theory:</u> <ul style="list-style-type: none"> <li>• Explain the engine oil types</li> </ul>	Theory-05 Hrs  Practical-09 Hrs  Total- 14 Hrs	<ul style="list-style-type: none"> <li>• Socket Set</li> <li>• Oil Pan</li> <li>• Petrol for Flush</li> <li>• Oil Pan Kit</li> <li>• Prime Mover/Engine</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>Dismantle jan or gas kit</li> </ul>	<p>according to grade</p> <p><b><u>Practical Activity:</u></b></p> <ul style="list-style-type: none"> <li>Drain engine oil</li> <li>Inspect the how many engine oil restore from the engine</li> <li>Check the engine thickness</li> </ul>			
<p><b>LU4.</b></p> <p>Dismantle Connecting Rod And Piston</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>Dismantle the big end bearing bolts</li> <li>Remove the big end bearing</li> <li>Remove the connecting rod</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><b><u>Theory:</u></b></p> <ul style="list-style-type: none"> <li>Explain the types of piston</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ul style="list-style-type: none"> <li>Inspect big end bearing</li> <li>Inspect the connecting rod</li> </ul>	<p>Theory-05 Hrs</p> <p>Practical-09 Hrs</p> <p>Total- 14 Hrs</p>	<ul style="list-style-type: none"> <li>Socket Set</li> <li>Hammer</li> <li>Wooden Rod</li> <li>Prime Mover/Engine</li> </ul>	<p>Training Workshop</p>



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<p><b>LU5.</b></p> <p>Disconnect The Piston From Connecting Rod</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Dismantle the lock ring from piston pins</li> <li>• Remove gudgeon pin</li> <li>• Separate the piston from connecting rod</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>• How much torque required for tighten the connecting rod</li> </ul> <p><u><b>Practical Activity:</b></u></p> <ul style="list-style-type: none"> <li>• Inspect the piston and piston pins</li> <li>• Inspect the connecting rod</li> </ul>	<p>Theory-04 Hrs</p> <p>Practical-09 Hrs</p> <p>Total- 13 Hrs</p>	<ul style="list-style-type: none"> <li>• Vernier Caliper</li> <li>• Circlip Plier</li> <li>• Brass rod</li> <li>• hammer</li> </ul>	<p>Training Workshop</p>
<p><b>LU6.</b></p> <p>Remove The Piston Rings From Piston</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Collect the ring compressor</li> <li>• Remove the rings from piston</li> <li>• Separate the piston from connecting rod</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>• Describe the types of rings</li> </ul> <p><u><b>Practical Activity:</b></u></p> <ul style="list-style-type: none"> <li>• Inspect the piston rings be carefully</li> </ul>	<p>Theory-05 Hrs</p> <p>Practical-09 Hrs</p> <p>Total- 14 Hrs</p>	<ul style="list-style-type: none"> <li>• Piston expander</li> <li>• Nose plier</li> <li>• Lock plier</li> <li>• Cotton Waste</li> <li>• Vernier Caliper</li> <li>• Piston</li> <li>• Piston rings</li> </ul>	<p>Training Workshop</p>



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		<ul style="list-style-type: none"> <li>Measure the size of piston rings</li> </ul>			
<b>LU7.</b>  Check Piston Condition	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Check the piston physical condition</li> <li>Check the piston ovalness</li> <li>Check the piston ring area</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>Describe the ovalness of piston</li> </ul> <u><b>Practical Activity:</b></u> <ul style="list-style-type: none"> <li>Inspect the piston condition</li> <li>Inspect the piston ovalness</li> </ul>	Theory-05 Hrs  Practical-09 Hrs  Total- 14 Hrs	<ul style="list-style-type: none"> <li>Petrol for Flushing</li> <li>Air Compressor</li> <li>Micrometer</li> </ul>	Training Workshop
<b>LU8.</b>  Remove The Crankshaft	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Disconnect the journal bearing</li> <li>Disconnect the thrust bearing</li> <li>Remove the crankshaft from block</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>Explain the types of cylinder block</li> </ul>	Theory-05 Hrs  Practical-09 Hrs  Total- 14 Hrs	<ul style="list-style-type: none"> <li>Socket Set</li> <li>Hammer</li> <li>Cotton waste</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>Inspect the physical condition of crankshaft</li> </ul>	<p>according cooling system</p> <p><b><u>Practical Activity:</u></b></p> <ul style="list-style-type: none"> <li>Measure the size of main journal bearing</li> <li>Measure the size of crank shaft</li> </ul>			
<p><b>LU9.</b></p> <p>Remove The Cam Shaft</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>Disconnect the cam shaft bearing bolt</li> <li>Remove the camshaft from block</li> <li>Inspect the physical condition of camshaft</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><b><u>Theory:</u></b></p> <ul style="list-style-type: none"> <li>What is the difference between cam shaft and crank shaft</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ul style="list-style-type: none"> <li>Inspect the cam shaft</li> <li>Measure the size of cam shaft</li> </ul>	<p>Theory-04 Hrs</p> <p>Practical-09 Hrs</p> <p>Total- 13 Hrs</p>	<ul style="list-style-type: none"> <li>Socket Set</li> <li>Hammer</li> <li>Ring Spanner</li> </ul>	<p>Training Workshop</p>



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<p><b>LU10.</b></p> <p>Perform Cylinder Bore Measurement</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Clean the cylinder block</li> <li>• Measure the bore ovalness</li> <li>• Inspect the sleeve condition</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>• Describe the purpose of cylinder bore measurement</li> </ul> <p><u><b>Practical Activity:</b></u></p> <ul style="list-style-type: none"> <li>• Clean the complete engine parts with kerosene oil</li> </ul>	<p>Theory-04 Hrs</p> <p>Practical-09 Hrs</p> <p>Total- 13 Hrs</p>	<ul style="list-style-type: none"> <li>• Micrometer</li> <li>• Cylinder bore gauge</li> </ul>	<p>Training Workshop</p>
<p><b>LU11.</b></p> <p>Check Water Jacket And Oil Gallery Into Cylinder Block</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Clean the cylinder block</li> <li>• Flash the water jacket</li> <li>• Flash the oil gallery</li> <li>• Inspect the physical condition of cylinder block water jacket</li> <li>• Inspect the physical condition of cylinder block oil gallery</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>• At what pressure the water jacket is checked</li> </ul> <p><u><b>Practical Activity:</b></u></p> <ul style="list-style-type: none"> <li>• Clean and flush engine and there</li> </ul>	<p>Theory-05 Hrs</p> <p>Practical-09 Hrs</p> <p>Total- 14 Hrs</p>	<ul style="list-style-type: none"> <li>• Socket Set</li> <li>• Air compressor</li> <li>• Injector tester</li> <li>• Tool Try</li> </ul>	<p>Training Workshop</p>





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		<p>art with kerosene oil and water</p> <ul style="list-style-type: none"><li>• Inspect the all parts thoroughly after flushing</li></ul>			
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## Module: 9. Maintain Pressurized Irrigation System

**Objective:** After the completion of this module the Trainee will be able to Maintain Pressurized Irrigation System.

**Duration:** 54 Hours

**Theory:** 30 Hours

**Practice:** 24 Hours

**Credit Hours:** 5.4

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b> Check Pumping System Before Operation	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Check fuel, oil and water level in diesel engine</li> <li>Select appropriate type of fertilizer</li> <li>Check fertilizer level in the tank</li> <li>Carry out idle running of fertilizer pumps</li> <li>Check pipes for delivery of water and fertilizer</li> <li>Carryout cleanliness of valves, filter, nozzles etc.</li> </ul>	<b>Knowledge Based Questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Describe the types of pumps used is pressurized irrigation system</li> </ul> <b>Practical Activity:</b> <ul style="list-style-type: none"> <li>Inspect the fertilizer condition</li> </ul>	Theory-05 Hrs Practical-03Hrs Total- 08 Hrs	<ul style="list-style-type: none"> <li>Pipe wrench</li> <li>Spanner set</li> <li>Screw driver and Pliers</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>Carryout chlorination of water storage tank and pump</li> </ul>	<ul style="list-style-type: none"> <li>Carried idle RPM of pump</li> <li>Inspect the seepage of water in pump system if any</li> </ul>			
<b>Lu2.</b>  Check Pumping System During Startup	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Verify that the pumps are functioning properly.</li> <li>Watch for unusual noises, vibrations and overheating that may develop in the pump drive due to pump malfunction</li> </ul>	<b>Knowledge Based Questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Describe the characteristics required in pumps for pressurized irrigation system</li> </ul> <b>Practical Activity:</b> <ul style="list-style-type: none"> <li>Inspect the pump noise during the running condition</li> <li>Check the pump temperature</li> </ul>	Theory-05Hrs  Practical-03Hrs  Total-08 Hrs	<ul style="list-style-type: none"> <li>Central pivot irrigation system</li> <li>Pumps</li> <li>Prime mover</li> </ul>	Field



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<p><b>LU3.</b></p> <p>Check Pumping System after Startup</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Drain the oil from oil pan</li> <li>• Dismantle the oil pan bolts</li> <li>• Dismantle oil pan</li> <li>• Dismantle fan or gas kit</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>• How does the pressure gauge works</li> </ul> <p><u><b>Practical Activity:</b></u></p> <ul style="list-style-type: none"> <li>• Draw a supply line of water delivery</li> </ul>	<p>Theory-05 Hrs</p> <p>Practical-03 Hrs</p> <p>Total- 08 Hrs</p>	<ul style="list-style-type: none"> <li>• Pumping system</li> </ul>	<p>Training Workshop</p>
<p><b>LU4.</b></p> <p>Check Pressure Gauges and System Flushing</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Dismantle the big end bearing bolts</li> <li>• Remove the big end bearing</li> <li>• Remove the connecting rod</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>• Explain the purpose of air release valve</li> </ul> <p><u><b>Practical Activity:</b></u></p>	<p>Theory-05 Hrs</p> <p>Practical-03 Hrs</p> <p>Total- 08 Hrs</p>	<ul style="list-style-type: none"> <li>• Silica sand</li> <li>• lateral lines</li> <li>• Air release valve</li> </ul>	<p>Training workshop</p>



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		<ul style="list-style-type: none"> <li>Inspect the big end bolts and bearings</li> </ul>			
<b>LU5.</b>  Maintain Mains and Sub-Mains	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Dismantle the lock ring from piston pins</li> <li>Remove gudgeon pin</li> <li>Separate the piston from connecting rod</li> </ul>	<b>Knowledge Based Questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Differentiate the mains and sub mains</li> </ul> <b>Practical Activity:</b> <ul style="list-style-type: none"> <li>Inspect the gudgeon pin</li> </ul>	Theory-05 Hrs Practical-06 Hrs Total- 11 Hrs	<ul style="list-style-type: none"> <li>Screens of screen filter and discs of disc filters</li> <li>End caps/stop valves</li> <li>Engine/motor belts</li> </ul>	Training Workshop
<b>LU6.</b>  Maintain Laterals And Emitting Devices	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Identify damage or leakage of the lateral and emitting devices (drippers, mini/micro sprinklers etc.) by visual inspection.</li> </ul>	<b>Knowledge Based Questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Explain the importance of the cleaning device</li> </ul>	Theory-05 Hrs Practical-06 Hrs Total- 11 Hrs	<ul style="list-style-type: none"> <li>hacksaw blade with frame</li> <li>tube cutter</li> <li>Measuring tap</li> <li>Emitters/drippers/bubblers</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"><li>• Fix the damages of the lateral by replacing the damaged portion of the lateral and attaching new portions</li><li>• Clean the emitting devices by opening and cleaning the device.</li></ul>	<b><u>Practical Activity:</u></b> <ul style="list-style-type: none"><li>• Replace emitter</li></ul>			
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## Module: 10. Maintain Grain Dryer

**Objective:** After the completion of this module the Trainee will be able to Maintain Grain Dryer.

**Duration:** 30 Hours

**Theory:** 12 Hours

**Practice:** 18 Hours

**Credit Hours:** 3

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b> Identify Grain Dryer Types	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Enlist types of grain dryers</li> <li>Select appropriate grain dryer with respect to specified grain type</li> <li>Select appropriate grain dryer with respect to specified environment conditions</li> </ul>	<b>Knowledge based questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Describe the appropriate moisture contents of different grains for preservation</li> </ul> Define the purpose of the grain dryer  <b>Practical Activity:</b> <ul style="list-style-type: none"> <li>Inspect the grain dryer as per specification</li> </ul>	Theory-04 Hrs  Practical-03 Hrs  Total- 07 Hrs	<ul style="list-style-type: none"> <li>Inclinometer (Angle measuring )</li> <li>Grain dryers</li> </ul>	Training Workshop



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<p><b>LU2.</b></p> <p>Maintain Electric Dryer</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Check major components electric dryer.</li> <li>• Perform weekly maintenance of electric dryer.</li> <li>• Clean screens with water.</li> <li>• Maintain blower system.</li> <li>• Maintain the speed of blower according to grain requirement.</li> <li>• Calibrate moisture sensor accordingly grain requirement.</li> <li>• Clean the sensor with soft cloth on daily basis</li> </ul>	<p><b>Knowledge based questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>• Explain the types of blower</li> <li>• Define the sensor</li> </ul> <p><u><b>Practical Activity:</b></u></p> <ul style="list-style-type: none"> <li>• Clean screens</li> <li>• Calibrate the moisture sensor according grain requirement according grain requirement</li> </ul>	<p>Theory-04Hrs</p> <p>Practical-09Hrs</p> <p>Total-13Hrs</p>	<ul style="list-style-type: none"> <li>• Adjustable wrench</li> <li>• Combination plier</li> </ul>	<p>Training Workshop</p>
<p><b>LU3.</b></p> <p>Maintain Solar Photovoltaic(PV)Dryers</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Check major components of solar dryer (PV Fan, Air collector, drying</li> </ul>	<p><b>Knowledge based question</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>• Explain the PV</li> <li>• Define the function of collector</li> </ul>	<p>Theory-04Hrs</p> <p>Practical-06Hrs</p> <p>Total-10Hrs</p>	<ul style="list-style-type: none"> <li>• Screw driver(flat)</li> <li>• Grain Moisture Meter</li> </ul>	<p>Training Workshop</p>





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	<p>chamber with air ducts, chimney)</p> <ul style="list-style-type: none"><li>• Adjust solar energy collector at angle facing due south equal to latitude.</li><li>• Check air collector insulation for leakage</li><li>• Check the dryer frame for its alignment</li><li>• Check drying chamber well insulated air tight</li><li>• Check collector plate absorber painted matt black</li><li>• Ensure that glass cover, collector absorber and PV fan module is free from dust</li><li>• Check wear and tear and leakages of glass and dryer frame</li><li>• Repair wear and tear of glass and frame (if required)</li></ul>	<ul style="list-style-type: none"><li>• Define greenhouse effect</li></ul> <p><b><u>Practical Activity:</u></b></p> <ul style="list-style-type: none"><li>• Inspect the all equipment's of PV Dryer</li><li>• Adjust the PV dryer angle according specification</li><li>• Check the drying chamber care fully</li></ul>			
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	<ul style="list-style-type: none"><li>• Maintain blower speed according to requirement of grain</li></ul>				
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**Module: 11. Operate / Maintain Grain Thresher**

**Objective:** After the completion of this module the Trainee will be able to Operate / Maintain Grain Thresher.

**Duration: 60 Hours**

**Theory: 24 Hours**

**Practice: 36 Hours**

**Credit Hours: 06**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Select Thresher	<b>Trainee will be able to:</b> <ul style="list-style-type: none"><li>Identify types of Thresher</li><li>Enlist Main Component of Thresher</li></ul>	<b>Knowledge based questions</b> <b>Theory:</b> <ul style="list-style-type: none"><li>Describe the threshing process and types of threshers</li></ul> <b>Practical Activity:</b> <ul style="list-style-type: none"><li>Inspect the all components of Thresher</li></ul>	Theory-08 Hrs Practical-09 Hrs Total- 17 Hrs	<ul style="list-style-type: none"><li>Tool kit</li><li>Hammer</li><li>Grease</li><li>Grease Gun</li><li>Lubrication Oil</li></ul>	Training Workshop



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<p><b>LU2.</b></p> <p>Maintain Thresher</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Service and Lubricate (Greasing) thresher pulleys</li> <li>• Adjust tension of belts</li> <li>• Adjust Thresher Header</li> <li>• Adjust Threshing Drum Concave</li> <li>• Check Feeder Table Repair / Clean it if required</li> <li>• Check Crimp Screen</li> <li>• Inspect dressing fan</li> <li>• Check Dust Exhaust Plate (clean it if required)</li> <li>• Overhaul the Threshers covering : <ul style="list-style-type: none"> <li>• Feeding &amp; Threshing Unit</li> <li>• Blowing &amp; separating Unit</li> <li>• Sieve Assembly</li> <li>• Power Transmission Unit</li> <li>• Grain Handling Unit</li> </ul> </li> </ul>	<p><b>Knowledge based questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>• Describe the working principal of rasp bar and cutter bar</li> </ul> <p><u><b>Practical Activity:</b></u></p> <ul style="list-style-type: none"> <li>• Inspect the pulleys play</li> <li>• Adjust the thresher play as per recommendation</li> <li>• Clean the crimp screen</li> <li>• Observed the feeding and threshing unit toughly</li> </ul>	<p>Theory-08Hrs</p> <p>Practical-15Hrs</p> <p>Total-23 Hrs</p>	<ul style="list-style-type: none"> <li>• Works shop safety</li> <li>• Auxiliary Engine Thresher</li> <li>• Self Propelled Thresher</li> </ul>	<p>Training Workshop</p>
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<p><b>LU3.</b></p> <p>Operate Thresher</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Mount Thresher with Tractor</li> <li>• Operate Tractor mounted Thresher</li> <li>• Operate Auxiliary engine thresher (Peter engine type)</li> <li>• Operate Self Propelled Thresher (Field Visit)</li> </ul>	<p><b>Knowledge based questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>• Define the peter engine</li> <li>• Explained the benefits of self-propelled thresher</li> </ul> <p><u><b>Practical Activity:</b></u></p> <ul style="list-style-type: none"> <li>• Inspect the complete tractor working</li> <li>• Start the Peter Engine</li> <li>• Examined the self-propelled</li> </ul>	<p>Theory-08Hrs</p> <p>Practical-12Hrs</p> <p>Total-20 Hrs</p>	<ul style="list-style-type: none"> <li>• Goggles</li> <li>• Gloves</li> <li>• Cotton Waste</li> <li>• Operator Safety Helmet</li> </ul>	<p>Field</p>
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Inspect Sugar Cane Harvester	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Select appropriate tools for adjustment</li> <li>Check the adjustment of belts and Chains</li> <li>Inspect Topper of Sugarcane Harvester for carrying</li> <li>Inspect Crop divider and Lifter of Sugarcane Harvester for dividing and lifting</li> <li>Inspect Base Cutter of Sugarcane Harvester for cutting</li> </ul>	<b>Knowledge based questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>Describe the sugarcane conveying mechanism</li> </ul> <u><b>Practical Activity:</b></u> <ul style="list-style-type: none"> <li>Inspect defoliating device of Sugarcane Harvester regarding defoliating efficiency</li> </ul>	Theory-08 Hrs  Practical-12 Hrs  Total-20 Hrs	<ul style="list-style-type: none"> <li>Goggles</li> <li>Gloves</li> <li>Operator Safety Helmet</li> <li>Workshop Safety Helm</li> <li>Sugar Cane Harvester</li> </ul>	Field



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	<ul style="list-style-type: none"> <li>Inspect Conveying device of Sugarcane Harvester for conveying</li> <li>Inspect defoliating device of Sugarcane Harvester regarding defoliating efficiency</li> <li>Inspect Cane Collector of Sugarcane Harvester</li> </ul>				
<b>LU2.</b>  Operate Sugar Cane Harvester	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Inspect the control panel and adjust if required</li> <li>Start the Sugar cane harvester and interpret the signs and signals of instrument cluster</li> <li>Select the cutting size of sugar cane</li> <li>Adjust the height of cutting assembly</li> <li>Ensure safe transmission of sugar cane to Dumper</li> </ul>	<b>Knowledge based questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>Describe the signs and symbols of Sugarcane harvester instrument cluster</li> </ul> <u><b>Practical Activity:</b></u> <ul style="list-style-type: none"> <li>Start the Sugar cane harvester and interpret the signs and signals of instrument cluster</li> </ul>	Theory-08Hrs Practical-12Hrs Total-20 Hrs	<ul style="list-style-type: none"> <li>Goggles</li> <li>Gloves</li> <li>Operator Safety Helmet</li> <li>Workshop Safety Helm</li> <li>Sugar Cane Harvester</li> </ul>	Field



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		<ul style="list-style-type: none"> <li>Select the cutting size of sugar cane</li> </ul>			
<b>LU3.</b>  Maintain Sugar Cane Harvester	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Maintain blade sharpness</li> <li>Lubricate all lubricants point</li> <li>Service the Sugar cane Harvester</li> <li>Lubricate the greasing points of sugarcane harvester</li> <li>Park Sugarcane harvester according to operator manual</li> </ul>	<b>Knowledge based questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>Describe the greasing points of sugarcane harvester</li> </ul> <u><b>Practical Activity:</b></u> <ul style="list-style-type: none"> <li>Lubricate the greasing points of sugarcane harvester</li> <li>Inspect Sugarcane harvester according to operator</li> </ul>	Theory-08Hrs Practical-12Hrs Total-20 Hrs	<ul style="list-style-type: none"> <li>Goggles</li> <li>Gloves</li> <li>Operator Safety Helmet</li> <li>Workshop Safety Helm</li> <li>Sugar Cane Harvester</li> </ul>	Field





## Module: 13. Operate / Maintain Combine Harvester

**Objective:** After the completion of this module the Trainee will be able to Operate / Maintain Combine Harvester.

Duration: 150 Hours

Theory: 60 Hours

Practice: 90 Hours

Credit Hours: 15

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b> Inspect General Combine Section	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Select appropriate tools for adjustment</li> <li>Check the adjustment of belts</li> <li>Prepare Inspection report</li> <li>Inspect and service the following unit of Combine Harvester</li> <li>Pickup type reel / Bay Type Real</li> <li>Cutter Bar</li> <li>knife section</li> <li>Guards</li> </ul>	<b>Knowledge based questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Describe the different process of wheat combine harvester</li> </ul> <b>Practical Activity:</b> <ul style="list-style-type: none"> <li>Inspect Pickup type reel / Bay Type Real</li> </ul>	Theory-20 Hrs Practical-30 Hrs Total-50 Hrs	<ul style="list-style-type: none"> <li>Wheat combine harvester</li> </ul>	Field



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	<ul style="list-style-type: none"> <li>• Ledger plates</li> <li>• Wearing plates</li> <li>• Pitman Drive assembly</li> <li>• Calculate the real index</li> <li>• Inspect the following component of Feeding Unit for Grain Losses</li> <li>• Header Auger</li> <li>• Retractable Fingers</li> <li>• Feeder Conveyer</li> <li>• Feeder Beater</li> <li>• Inspect the following components of Threshing Unit for Threshing Efficiency</li> <li>• Rasp bar cylinder</li> <li>• Rub bar cylinder</li> <li>• Spike tooth cylinder</li> <li>• Concave</li> <li>• Cylinder beater</li> <li>• Feeding plate</li> <li>• Cylinder stripper</li> <li>• Inspect the following components of Separating Unit for Grain Brakeage</li> <li>• Concave Grates</li> </ul>	<ul style="list-style-type: none"> <li>• Check Cutter Bar</li> <li>• Inspect knife section</li> <li>• Check Guards</li> </ul>			
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	<ul style="list-style-type: none"> <li>• Finger Grate</li> <li>• Straw walker</li> <li>• Grain Return pan</li> <li>• Grain Pan</li> <li>• Inspect the following components of Cleaning Unit For Cleaning Efficiency</li> <li>• Adjustable Chaffer</li> <li>• Chaffer Extension</li> <li>• Shoe Sieve</li> <li>• Cleaning Fan</li> <li>• Clean Grain Auger &amp; Elevator</li> <li>• Tailing Auger &amp; Elevator</li> </ul>				
<b>LU2.</b>  Operate Combine Harvester	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Inspect the control panel Signs, Signal and adjust if required</li> <li>• Start the harvester</li> <li>• Operate the mechanism / Basic Operation of Combine Harvester</li> <li>• Cutting Unit / Mechanism</li> <li>• Feeding Unit / Mechanism</li> <li>• Threshing Unit / Mechanism</li> </ul>	<b>Knowledge based questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>• What does real index mean</li> </ul> <b>Practical Activity:</b>	Theory-20Hrs  Practical-45 Hrs  Total-65Hrs	<ul style="list-style-type: none"> <li>• Operator Safety Helmet</li> <li>• Combine Harvester</li> </ul>	Field



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	<ul style="list-style-type: none"> <li>• Separating Unit / Mechanism</li> <li>• Cleaning Unit / Mechanism</li> <li>• Grain Handling Unit / Mechanism</li> <li>• Select the threshing drum according to job requirement</li> <li>• Adjust the R.P.M of each section</li> <li>• Adjust the height of header</li> <li>• Adjust the height of reel (according to crop)</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust the RPM of threshing drum and cutter bar</li> <li>• Adjust concave of harvester</li> </ul>			
<b>LU3.</b>  Ensure Safe Unloading	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Observe grain sensor</li> <li>• Perform unloading</li> <li>• Restore the unloading operation (Grain Auger)</li> <li>• Park Combine harvester according to operator manual</li> </ul>	<b>Knowledge based questions</b>  <b><u>Theory:</u></b> <ul style="list-style-type: none"> <li>• Describe the grain flow line in harvester</li> </ul> <b><u>Practical Activity</u></b> <ul style="list-style-type: none"> <li>• Unload the harvester</li> </ul>	Theory-20Hrs  Practical-15Hrs  Total-35 Hrs	<ul style="list-style-type: none"> <li>• Trolley</li> <li>• Combine harvester</li> </ul>	Field



## Module: 14. Apply Management And Communication Techniques

**Objective:** After the completion of this module the Trainee will be able to Apply Management And Communication Techniques.

**Duration: 30 Hours**

**Theory: 09 Hours**

**Practice: 21 Hours**

**Credit Hours:03**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Contribute To Communications Planning	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Identify, source and contribute relevant information requirements to initial project documentation</li> <li>Contribute to developing and implementing the project</li> <li>communications plan and communications networks</li> </ul>	<b>Knowledge based questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>knowledge of 7 C's</li> <li>Knowledge of planning project</li> <li>Knowledge of communication networks</li> </ul> <b>Practical Activity:</b>	          Theory-03 Hrs Practical-3 Hrs Total-06 Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



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		<ul style="list-style-type: none"> <li>Prepare a communication plan of an initial project</li> </ul>			
<b>LU2.</b>  Conduct Information-Management Activities	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Act on and process project information according to agreed procedures as directed, to aid decision-making processes throughout project life cycle</li> <li>Maintain information to ensure data is secure and auditable</li> </ul>	<b>Knowledge based questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Define project lifecycle</li> <li>Data security</li> <li>Management activities</li> </ul> <b>Practical Activity:</b> <ul style="list-style-type: none"> <li>Conduct Information-Management Activities</li> </ul>	Theory-02Hrs  Practical-03.Hrs  Total-05Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Erasor</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



<b>LU3.</b>	<b>Trainee will be able to:</b>	<b>Knowledge based questions</b>		<ul style="list-style-type: none"> <li>Pencil</li> <li>Erasor</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room Training Workshop Lab/ Field Visit
Communicate Project Information	<ul style="list-style-type: none"> <li>Communicate with clients and other stakeholders during project using agreed networks, processes and procedures to ensure flow of necessary information</li> <li>Ensure reports are prepared and released according to authorization, or produced for release by others</li> <li>Seek information and advice from appropriate project authorities as required</li> </ul>	<b>Theory:</b> <ul style="list-style-type: none"> <li>Define stakeholders</li> <li>Preparation of communication project report</li> </ul> <b>Practical Activity</b> <ul style="list-style-type: none"> <li>Prepare communication report of a given project</li> </ul>	Theory-02Hrs  Practical-09 Hrs  Total-11Hrs		
<b>LU4.</b>	<b>Trainee will be able to:</b>	<b>Knowledge based questions</b>		<ul style="list-style-type: none"> <li>Pencil</li> <li>Erasor</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room Training Workshop Lab/ Field Visit
review Project Information	<ul style="list-style-type: none"> <li>Assist in ongoing review of project outcomes to determine effectiveness of communications-management activities</li> </ul>	<b>Theory:</b> <ul style="list-style-type: none"> <li>communication issues</li> </ul>	Theory-02Hrs  Practical-06Hrs  Total-08 Hrs		



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	<ul style="list-style-type: none"><li>Report communications-management issues and responses to higher project authorities for application of lessons learned to future projects</li></ul>	<ul style="list-style-type: none"><li>management issues</li></ul> <p><b><u>Practical Activity</u></b></p> <ul style="list-style-type: none"><li>Review communication report of a given project</li></ul>			
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## Module: 15. Create Human Resource Management Plan

**Objective:** After the completion of this module the Trainee will be able to Create Human Resource Management Plan.

**Duration: 30 Hours**

**Theory: 09 Hours**

**Practice: 21 Hours**

**Credit Hours: 03**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Assist In Determining Human Resource Requirements	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Analyze work breakdown structure to determine human resource requirements</li> <li>Prepare a skills analysis of project personnel against project task requirements</li> <li>Assist in assigning responsibilities for achieving project deliverables</li> </ul>	<b>Knowledge based questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Work breakdown structure (WBS)</li> <li>Knowledge of human resource requirements</li> </ul> <b>Practical Activity:</b> <ul style="list-style-type: none"> <li>Analyze work breakdown structure human resource requirements</li> </ul>	          Theory-03 Hrs Practical-6 Hrs Total-9 Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Erasor</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



<b>LU2.</b> Contribute To Establishing And Maintaining Productive Team Relationships	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Actively seek views and opinions of team members during task planning and implementation</li> <li>Promote cooperation and effective activities, goals and relationships within team</li> <li>Communicate with others using styles and methods appropriate to organizational standards, group expectations and desired outcomes</li> <li>Communicate information and ideas to others in a logical, concise and understandable manner</li> <li>Regularly seek feedback on nature and quality of work relationships, and use feedback as basis for</li> </ul>	<b>Knowledge based questions</b> <b>Theory:</b> <ul style="list-style-type: none"> <li>Project planning and implementation</li> <li>7 C's of communication</li> </ul> <b>Practical Activity:</b> <ul style="list-style-type: none"> <li>Prepare human resource management plan</li> </ul>	Theory-02Hrs Practical-06Hrs Total-08 Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room Training Workshop Lab/ Field Visit



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	own improvement and development				
<b>LU3.</b>  Assist With Human Resource Monitoring	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Monitor work of project personnel against assigned roles and responsibilities within delegated authority levels</li> <li>• Monitor and control actual effort against project plan</li> <li>• Review skill levels against allocated tasks and recommend solutions, where required, to others</li> <li>• Advise others within delegated authority when assigned responsibilities are not met by project personnel</li> <li>• Undertake work in a multi-disciplinary environment according to established</li> </ul>	<b>Knowledge based questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>• Roles and responsibilities of HR</li> </ul> <b>Practical Activity</b> <ul style="list-style-type: none"> <li>• Monitor human resource management plan</li> </ul>	Theory-02Hrs  Practical-06Hrs  Total-08 Hrs	<ul style="list-style-type: none"> <li>• Pencil</li> <li>• Eraser</li> <li>• Notebook</li> <li>• Whiteboard</li> <li>• Computer</li> <li>• Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



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	<p>human resource management practices, plans, guidelines and procedures</p> <ul style="list-style-type: none"> <li>• Resolve conflict within delegated authority according to agreed dispute-resolution processes</li> <li>• Assist in offering human resource development opportunities to individuals with skill gaps</li> </ul>				
<p><b>LU4.</b></p> <p>Contribute To Evaluating Human Resource Practices</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Contribute to assessing effectiveness of project human resources management</li> <li>• Document lessons learned to support continuous improvement processes</li> </ul>	<p><b>Knowledge based questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>• Workforce organization</li> <li>• Organizational goals</li> <li>• Improvement techniques</li> </ul>	<p>Theory-02Hrs</p> <p>Practical-03Hrs</p> <p>Total-05 Hrs</p>	<ul style="list-style-type: none"> <li>• Pencil</li> <li>• Eraser</li> <li>• Notebook</li> <li>• Whiteboard</li> <li>• Computer</li> <li>• Internet</li> </ul>	<p>Class Room</p> <p>Training Workshop</p> <p>Lab/ Field Visit</p>



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		<b><u>Practical Activity</u></b> <ul style="list-style-type: none"><li>Evaluate human resource management plan</li></ul>			
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## Module: 16. Develop Entrepreneurial Skills

**Objective:** After the completion of this module the Trainee will be able to Develop Entrepreneurial Skills.

**Duration: 30 Hours**

**Theory: 09 Hours**

**Practice: 21 Hours**

**Credit Hours: 03**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Develop A Business Plan	<b>Trainee will be able to:</b> <ul style="list-style-type: none"><li>• Conduct a market survey to collect following information</li><li>• Business Model</li><li>• Financials</li><li>• Equipment Estimation</li><li>• Revenue Generation Sources</li><li>• Marketing strategy</li><li>• Market Trends</li><li>• Overall Expenses</li><li>• Select the best option in terms of cost, service, quality, sales, operational expenses</li><li>• Compile the information collected through the market survey, in the business plan format</li></ul>	<b>Knowledge based questions</b>  <b><u>Theory:</u></b> <ul style="list-style-type: none"><li>• Business plan</li><li>• Business description</li><li>• Organization and management structure</li><li>• Financial projections</li></ul> <b><u>Practical Activity:</u></b> <ul style="list-style-type: none"><li>• Conduct a market survey to collect</li></ul>	Theory-03 Hrs  Practical-9 Hrs  Total-12 Hrs	<ul style="list-style-type: none"><li>• Pencil</li><li>• Eraser</li><li>• Notebook</li><li>• Whiteboard</li><li>• Computer</li><li>• Internet</li></ul>	Class Room  Training Workshop  Lab/ Field Visit



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		information for business plan			
<b>LU2</b>  Develop A Marketing Plan	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Make a marketing plan for the service products, price, placement, promotion, people, packaging and positioning</li> <li>• Include the information of marketing plan in the business plan</li> </ul>	<b>Knowledge based questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>• Marketing skills</li> <li>• Marketing strategies</li> <li>• Marketing trends</li> <li>• Marketing plan</li> </ul> <u><b>Practical Activity:</b></u> <ul style="list-style-type: none"> <li>• Prepare a marketing plan</li> </ul>	Theory-03Hrs  Practical-06Hrs  Total-09 Hrs	<ul style="list-style-type: none"> <li>• Pencil</li> <li>• Eraser</li> <li>• Notebook</li> <li>• Whiteboard</li> <li>• Computer</li> <li>• Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit
<b>LU3.</b>  Develop Basic Business Communication Skills	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Communicate with guests using effective communication skills</li> <li>• Use different modes of communication to communicate</li> </ul>	<b>Knowledge based questions</b>  <u><b>Theory:</b></u>	Theory-03Hrs  Practical-06Hrs	<ul style="list-style-type: none"> <li>• Pencil</li> <li>• Eraser</li> <li>• Notebook</li> <li>• Whiteboard</li> <li>• Computer</li> </ul>	Class Room  Training Workshop



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	<p>effectively e.g.: presentation, speaking, writing, listening, visual representation, reading etc.</p> <ul style="list-style-type: none"> <li>• Use specific business terms used in the market</li> </ul>	<ul style="list-style-type: none"> <li>• 7 C's of communication</li> <li>• Modes of communication</li> <li>• Basic communication skills for business plan</li> </ul> <p><b><u>Practical Activity</u></b></p> <ul style="list-style-type: none"> <li>• Prepare a presentation to represent basic communication skills</li> </ul>	Total-09 Hrs	<ul style="list-style-type: none"> <li>• Internet</li> </ul>	Lab/ Field Visit
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## Module: 17 Develop Project Management Plan

**Objective:** After the completion of this module the Trainee will be able to Develop Project Management Plan.

**Duration: 30 Hours**

**Theory: 09 Hours**

**Practice: 21 Hours**

**Credit Hours: 03**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Prepare Project Management Plan	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Evaluate and assess project brief and related documents</li> <li>Produce document on project tasks and associated timelines, including installation processes and test requirements</li> <li>Assess and produce document on resource requirements to assist allocation of appropriate resources</li> <li>Produce training plan assessing training needs and associated</li> </ul>	<b>Knowledge based questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Knowledge of Project Management Plan (PMP)</li> <li>Components of PMP</li> </ul>	Theory-03 Hrs  Practical-9 Hrs  Total-12 Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



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	<p>timelines for efficient project implementation</p> <ul style="list-style-type: none"> <li>• Determine and document budgetary requirements</li> <li>• . Discuss roles of all identified parties associated with project to ensure their involvement</li> <li>• Produce project verification document, including monitoring and control processes, and review processes such as quality audits</li> <li>• Consult with all relevant parties prior to finalizing draft plan and make changes as appropriate</li> </ul>	<p><b><u>Practical Activity:</u></b></p> <ul style="list-style-type: none"> <li>• Prepare Project Management Plan</li> </ul>			
<p><b>LU2</b></p> <p>Develop And Evaluate Management Plan</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Produce preliminary plan for consultation, including identified factors that may impact on realization of project and observance of relevant legislation, codes, regulation and standards</li> <li>• Consult with client and clarify any amendments</li> <li>• Develop final plan with recommendations</li> </ul>	<p><b>Knowledge based questions</b></p> <p><b><u>Theory:</u></b></p> <ul style="list-style-type: none"> <li>• Objectives of project</li> <li>• Importance of Management plan</li> </ul>	<p>Theory- 02Hrs</p> <p>Practical- 03Hrs</p> <p>Total-05 Hrs</p>	<ul style="list-style-type: none"> <li>• Pencil</li> <li>• Eraser</li> <li>• Notebook</li> <li>• Whiteboard</li> <li>• Computer</li> <li>• Internet</li> </ul>	<p>Class Room</p> <p>Training Workshop</p> <p>Lab/ Field Visit</p>



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		<b><u>Practical Activity:</u></b> <ul style="list-style-type: none"> <li>Evaluate Project Management Plan</li> </ul>			
<b>LU3.</b>  Communicate Project Information	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Produce and document final plan to include implementation details and training needs</li> <li>Present plan to client and obtain sign off</li> </ul>	<b>Knowledge based questions</b>  <b><u>Theory</u></b> <ul style="list-style-type: none"> <li>7 C's of communication</li> <li>Modes of communication</li> <li>Basic communication skills for project plan</li> </ul> <b><u>Practical Activity</u></b> <ul style="list-style-type: none"> <li>Present the prepared plan to client.</li> </ul>	Theory-02Hrs  Practical-03 Hrs  Total-05 Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



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<p><b>LU4.</b></p> <p>Contribute To Assessing Effectiveness Of Communication</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>Assist in ongoing review of project outcomes to determine effectiveness of communications-management activities</li> <li>Report communications-management issues and responses to higher project authorities for application of lessons learned to future projects</li> </ul>	<p><b>Knowledge based questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>Communication issues</li> <li>Management issues</li> </ul> <p><u><b>Practical Activity</b></u></p> <ul style="list-style-type: none"> <li>Review project management plan</li> </ul>	<p>Theory- 02Hrs</p> <p>Practical- 06Hrs</p> <p>Total-08 Hrs</p>	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	<p>Class Room</p> <p>Training Workshop</p> <p>Lab/ Field Visit</p>
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## Module: 18. Develop Sales Plan

**Objective:** After the completion of this module the Trainee will be able to Develop Sales Plan.

**Duration: 30 Hours**

**Theory: 09 Hours**

**Practice: 21 Hours**

**Credit Hours: 03**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b> Identify Organizational Strategic Direction	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Obtain and analyze assessment of market needs and strategic planning documents</li> <li>Review previous sales performance and successful approaches to identify factors affecting performance</li> <li>Analyze information on market needs, new opportunities, customer profiles and requirements as a basis for decision making</li> <li>Carry out competitor analysis for rate structure</li> </ul>	<b>Knowledge based questions</b> <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>Organizational objectives</li> <li>Organizational strategies</li> </ul> <u><b>Practical Activity:</b></u> <ul style="list-style-type: none"> <li>Identify Organizational Strategic Direction</li> </ul>	Theory-02 Hrs Practical-03 Hrs Total-05Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room Training Workshop Lab/ Field Visit



LU2  Establish Performance Targets	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Determine practical and achievable sales targets</li> <li>Establish realistic timelines for achieving targets</li> <li>Determine measures to allow for monitoring of performance</li> <li>Ensure objectives of the sales plan and style of the campaign are consistent with organizational strategic objectives and corporate image</li> </ul>	<b>Knowledge based questions</b>  <u>Theory:</u> <ul style="list-style-type: none"> <li>Sales plan and style</li> <li>Sales plan objectives</li> <li>Sales target</li> </ul> <u>Practical Activity:</u> <ul style="list-style-type: none"> <li>Prepare timelines for achieving targets</li> </ul>	Theory- 02Hrs  Practical- 03Hrs  Total-05Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



<b>LU3.</b>  Develop A Sales Plan For A Product	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Determine approaches to be used to meet sales objectives</li> <li>Identify additional expertise requirements and allocate budgetary resources accordingly</li> <li>Identify risks and develop risk controls</li> <li>Develop advertising and promotional strategy for product</li> <li>Identify appropriate distribution channels for product</li> <li>Prepare a budget for the sales plan</li> <li>Present documented sales plan to appropriate personnel for approval</li> </ul>	<b>Knowledge based questions</b>  <u>Theory:</u> <ul style="list-style-type: none"> <li>Sales plan goals</li> <li>Resource allocation</li> <li>Distribution channels</li> <li>Risk management</li> </ul> <u>Practical Activity</u> <ul style="list-style-type: none"> <li>Prepare a sales plan for given product</li> </ul>	Theory- 02Hrs  Practical- 06Hrs  Total-08Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit
<b>LU4.</b>  Identify Support Requirements	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Identify and acquire staff resources to implement sales plan</li> <li>Develop an appropriate selling approach</li> </ul>	<b>Knowledge based questions</b>  <u>Theory:</u> <ul style="list-style-type: none"> <li>Selling methods</li> <li>Target customers</li> </ul>	Theory- 02Hrs  Practical- 06Hrs  Total-08Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop



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	<ul style="list-style-type: none"> <li>Train staff in the selling approach selected</li> <li>Develop and assess staff knowledge of product to be sold</li> </ul>	<ul style="list-style-type: none"> <li>Staff knowledge</li> </ul> <p><b><u>Practical Activity</u></b></p> <ul style="list-style-type: none"> <li>Develop an appropriate selling approach</li> </ul>			Lab/ Field Visit
<b>LU5.</b>  Monitor Review Plan And Sales	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Monitor implementation of the sales plan</li> <li>Record data measuring performance versus sales targets</li> <li>Make adjustments to sales plan as required to ensure required results are obtained</li> </ul>	<b>Knowledge based questions</b>  <p><b><u>Theory:</u></b></p> <ul style="list-style-type: none"> <li>Implementation of sales plan</li> </ul> <p><b><u>Practical Activity</u></b></p> <ul style="list-style-type: none"> <li>Review sales plan of given product</li> </ul>	Theory- 01Hrs  Practical- 03Hrs  Total-04 Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit





## Module: 19. Conduct Research For Customer Needs And Satisfaction

**Objective:** After the completion of this module the Trainee will be able to Conduct Research For Customer Needs And Satisfaction.

Duration: 30 Hours

Theory: 09 Hours

Practice: 21 Hours

Credit Hours: 03

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Assist Customer To Articulate Needs	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Ensure customer needs are fully explored, understood and agreed</li> <li>Explain and match available services and products to customer needs</li> <li>Identify and communicate rights and responsibilities of customers to the customer as appropriate</li> </ul>	<b>Knowledge based questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Understanding of customer need</li> <li>Feedback</li> <li>expectations</li> <li>responsibilities of customers</li> </ul>	Theory-03 Hrs  Practical-03 Hrs  Total-06 Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



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		<b><u>Practical Activity:</u></b> <ul style="list-style-type: none"> <li>Identify customer needs for given product</li> </ul>			
<b>LU2</b>  Satisfy Complex Customer Needs	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>identify possibilities for meeting customer needs</li> <li>Assist customers to evaluate service and/or product options to satisfy their needs</li> <li>Determine and prioritize preferred actions</li> <li>Identify potential areas of difficulty in customer service delivery and take appropriate actions in a positive manner</li> </ul>	<b>Knowledge based questions</b>  <b><u>Theory:</u></b> <ul style="list-style-type: none"> <li>Knowledge of complex customer needs</li> </ul> <b><u>Practical Activity:</u></b> <ul style="list-style-type: none"> <li>Ensure customer needs</li> </ul>	Theory-02 Hrs  Practical-03Hrs  Total-05Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



<b>LU3.</b> Manage Networks To Ensure Customer Needs Are Addressed	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Establish effective regular communication with customers</li> <li>Establish, maintain and expand relevant networks to ensure appropriate referral of customers to products and services from within and outside the organization</li> <li>Ensure procedures are in place to ensure that decisions about targeting of customer services are based on up-to-date information about the customer and the products and services available</li> <li>Ensure procedures are put in place to ensure that referrals are based on the matching of the assessment of customer needs and availability of products and services</li> </ul>	<b>Knowledge based questions</b> <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>Effective communication</li> <li>Communication networks</li> <li>feedbacks</li> </ul> <u><b>Practical Activity</b></u> <ul style="list-style-type: none"> <li>Monitor customer needs</li> </ul>	Theory-02 Hrs Practical-06Hrs Total-08Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room Training Workshop Lab/ Field Visit



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	<ul style="list-style-type: none"> <li>Maintain records of customer interaction in accordance with organizational procedures</li> </ul>				
<b>LU4.</b>  Convert Customer Enquiries Into Sales	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Use information provided by customers or accessed from the customer relationship management (CRM) system to identify any needs</li> <li>Identify suitable products/services to meet needs</li> <li>Make convincing sales pitches to customers following standard scripts</li> <li>Handle customer queries, objections and rebuttals following standard scripts</li> <li>Adapt your approach and style to customer preferences, within the limits of your competence and authority</li> <li>Refer issues outside your area of competence and authority to</li> </ul>	<b>Knowledge based questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>Customer relationship management (CRM)</li> <li>Types of CRM</li> </ul> <u><b>Practical Activity</b></u> <ul style="list-style-type: none"> <li>Prepare a CRM plan</li> </ul>	Theory-02Hrs  Practical-09Hrs  Total-11Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



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	<p>appropriate people, following your organization's procedures</p> <ul style="list-style-type: none"><li>• Identify and act on opportunities to up-sell or cross-sell other products/services to customers</li><li>• Confirm customer wishes and needs in order to close sales</li><li>• Obtain required financial information from customers, following your organization's procedures</li><li>• Complete your organization's post-sales procedures in order to complete/ fulfill sales</li><li>• Comply with relevant standards, policies, procedures and guidelines when converting customer enquiries into sales</li></ul>				
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Develop Personal Budget A	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Calculate current living expenses using available information to prepare a personal budget.</li> <li>Keep a record of all income and expenses for a short period of time to help estimate ongoing expenses.</li> <li>Subtract total expenses from total income to determine a surplus or deficit budget for the specified period.</li> <li>Find reasons for a deficit budget and ways to reduce expenditure identified.</li> <li>Identify ways to increase income, if possible</li> </ul>	<b>Knowledge based questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>Explain budget</li> <li>Types of budget</li> <li>Finances</li> <li>Calculation of expenses</li> </ul> <u><b>Practical Activity:</b></u> <ul style="list-style-type: none"> <li>Prepare Personal Budget</li> </ul>	          Theory-03 Hrs  Practical-06 Hrs  Total-09 Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> <li>Calculator</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



<p><b>LU2</b></p> <p>Develop Longer Term Personal Budget</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>Analyze income and expenditure and set longer term personal, work and financial goals.</li> <li>Develop a longer-term budget based on the outcomes of short-term budgeting, and adjust to meet living, work and future career requirements.</li> <li>Identify obstacles that might affect finances such as job loss, sickness or unexpected expenses or contingency savings</li> <li>Formulate a regular savings plan based on budget, using secure savings products and services.</li> <li>Monitor expenditure against budget and identify areas of possible expenditure saving</li> </ul>	<p><b>Knowledge based questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>Financial goals</li> <li>Long-term and short-term budgeting</li> <li>Finance issues</li> </ul> <p><u><b>Practical Activity:</b></u></p> <ul style="list-style-type: none"> <li>Prepare and monitor Longer Term Personal Budget</li> </ul>	<p>Theory-03Hrs</p> <p>Practical-09 Hrs</p> <p>Total-12 Hrs</p>	<ul style="list-style-type: none"> <li>Pencil</li> <li>Erasor</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> <li>calculator</li> </ul>	<p>Class Room</p> <p>Training Workshop</p> <p>Lab/ Field Visit</p>
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<p><b>LU3.</b></p> <p>Identify Ways To Maximize Future Finances</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Determine sources and ways to maximize personal income, including from work, investments or available government payments/allowances.</li> <li>• Get further education or training to maintain or improve future income.</li> <li>• Identify the need for debt to finance living and other expenses, and determine the appropriate levels of debt and repayment.</li> <li>• Consolidate existing debt, where possible, to minimize interest costs and fees.</li> <li>• Seek professional money management services, where available, to ensure financial plans are effective and achievable</li> </ul>	<p><b>Knowledge based questions</b></p> <p><u><b>Theory:</b></u></p> <ul style="list-style-type: none"> <li>• Sources to increase finances</li> <li>• Define debt</li> <li>• Money management services</li> </ul> <p><u><b>Practical Activity</b></u></p> <ul style="list-style-type: none"> <li>• Identify Ways To Maximize Future Finances</li> </ul>	<p>Theory- 03Hrs</p> <p>Practical- 06Hrs</p> <p>Total-09Hrs</p>	<ul style="list-style-type: none"> <li>• Pencil</li> <li>• Eraser</li> <li>• Notebook</li> <li>• Whiteboard</li> <li>• Computer</li> <li>• Internet</li> <li>• Calculator</li> </ul>	<p>Class Room</p> <p>Training Workshop</p> <p>Lab/ Field Visit</p>
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## Module: 21. Identify and Apply Problem Solving Techniques at Workplace

Objective: This unit focuses on identification and application of various problem solving techniques/strategies at workplace.

Duration: 30 Hours

Theory: 09 Hours

Practice: 21 Hours

Credit Hours: 03

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b> Identify Problem A	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Form a problem statement and analyze root cause.</li> <li>Take initiative in tackling problems rather than relying solely on directives</li> <li>Follow logic steps in understanding root cause and analyzing potential solutions.</li> </ul>	<b>Knowledge based questions</b>  <b>Theory:</b> <ul style="list-style-type: none"> <li>Problems related to workplace</li> <li>Problem statement</li> </ul> <b>Practical Activity:</b> <ul style="list-style-type: none"> <li>Prepare Problem Statement to</li> </ul>	Theory-02 Hrs Practical-06 Hrs Total-08 Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room Training Workshop Lab/ Field Visit



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		Analyze root cause			
<b>LU2</b>  Determine Strategies For A Required Solution	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Analyze all aspects of the incident for degree of hazard, priorities, optional outcomes and appropriate strategies</li> <li>Analyze and determine strategies and priorities on the incident sought from a range of sources</li> <li>Assess long term objectives against resources and priorities</li> <li>Apply a range of communication techniques to make and maintain contact with the key people</li> <li>Provide clear and factual information to enable an honest and realistic assessment of the interests of the key people and their positions</li> <li>Resolve the conflict and express their likely consequences clearly and do an analysis of the benefits</li> </ul>	<b>Knowledge based questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>Problem solutions</li> <li>Strategies for problem solution</li> </ul> <u><b>Practical Activity:</b></u> <ul style="list-style-type: none"> <li>Prepare Strategies to resolve root causes</li> </ul>	Theory- 02Hrs  Practical- 06Hrs  Total-08 Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



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	<ul style="list-style-type: none"> <li>Reassess points of disagreements for common positive Positions</li> </ul>				
<b>LU3.</b>  Coordinate Support Services	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Assess the need for support services in terms of the determined strategies and priorities</li> <li>Negotiate the resources of support services according to established procedures and availability</li> <li>Provide information on strategies to support services and maintain the communication</li> <li>Delegate roles and responsibilities according to expertise and resources</li> </ul>	<b>Knowledge based questions</b>  <u><b>Theory:</b></u> <ul style="list-style-type: none"> <li>Roles and responsibilities of persons</li> <li>7 C's of communication</li> </ul> <u><b>Practical Activity</b></u> <ul style="list-style-type: none"> <li>Assign roles and responsibilities to concern person</li> </ul>	Theory- 02Hrs  Practical- 03Hrs  Total-05 Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> <li>Internet</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit
<b>LU4.</b>  Restore Order	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Assess the incidents for degree of risk and take appropriate action to</li> </ul>	<b>Knowledge based questions</b>	Theory- 02Hrs  Practical- 03Hrs	<ul style="list-style-type: none"> <li>Pencil</li> <li>Eraser</li> <li>Notebook</li> <li>Whiteboard</li> <li>Computer</li> </ul>	Class Room



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	<p>reduce and remove the impact of the incident and restore order</p> <ul style="list-style-type: none"> <li>• Take action designed to minimize risk and the preserve the safety and security of all involved</li> <li>• Take action to prevent the escalation of the incident appropriate to the circumstances and agreed procedures.</li> <li>• Carry out the use of force for the restoration of control and the maintenance of security in the least restrictive manner.</li> <li>• Complete reports accurately and clearly provided to the appropriate authority promptly</li> <li>• Review, evaluate and analyze the incident and the organizational response to it and report it promptly and accurately.</li> </ul>	<p><b><u>Theory:</u></b></p> <ul style="list-style-type: none"> <li>• Risk management</li> <li>• Types of risk/incidents</li> </ul> <p><b><u>Practical Activity</u></b></p> <ul style="list-style-type: none"> <li>• Review, evaluate and analyze the incident and report it accordingly</li> </ul>	Total-05 Hrs	<ul style="list-style-type: none"> <li>• Internet</li> </ul>	<p>Training Workshop</p> <p>Lab/ Field Visit</p>
<p><b>LU5.</b></p> <p>Provide Leadership.</p>	<p><b>Trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>• Link between the function of the group and the goals of the organization</li> <li>•</li> </ul>	<p><b>Knowledge based questions</b></p> <p><b><u>Theory:</u></b></p>	<p>Theory-01Hrs</p> <p>Practical-03 Hrs</p>	<ul style="list-style-type: none"> <li>• Pencil</li> <li>• Eraser</li> <li>• Notebook</li> <li>• Whiteboard</li> <li>• Computer</li> </ul>	<p>Class Room</p> <p>Training Workshop</p>



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Direction And Guidance  To The Work Group	<ul style="list-style-type: none"> <li>• Participate in decision making routinely to develop, implement and review work of the group and to allocate responsibilities where appropriate</li> <li>• Give opportunities and encouragement to others to develop new and innovative work practices and strategies</li> <li>• Identify conflict and resolve with minimum disruption to work group function</li> <li>• Provide staff with the support and supervision necessary to perform work safely and without risk to health</li> <li>• Allocate tasks within the competence of staff and support with appropriate authority, autonomy and training</li> <li>• Supervise appropriately the changing priorities and situations and takes into account the different needs of individuals and the requirements of the task</li> </ul>	<ul style="list-style-type: none"> <li>• Decision making</li> <li>• Leadership skills</li> </ul> <p><b><u>Practical Activity</u></b></p> <ul style="list-style-type: none"> <li>• Allocate tasks within the competence of staff and support with appropriate authority</li> </ul>	Total-04 Hrs	<ul style="list-style-type: none"> <li>• Internet</li> </ul>	Lab/ Field Visit
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***National Curriculum Level-5 in Agricultural Machinery Technology***





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**Curriculum Validation Members:**

	<b>Name</b>	<b>Designation</b>
1	Mr. Sikandar Masood	Director NAVTTTC/ Coordinator
2	Mr. Aijaz Ahmad Zia	DACUM Facilitator
3	Dr. Muhammad Naazir Khan Niazi	Chairman, PBTE Lahore
4	Mr Muzamil Hussain	AM, RYK PTEVTA
5	Mr. Muhammad Afzal	Asstt Manager, Millat Tractors, Rawalpindi
6	Engr. Shahzad Amir Rafiq	Instructor GCT, Sahiwal PTEVTA
7	Mr. Jamal Akbar	Associate Prof/Rep., KP TEVTA
8	Engr. Aqib Sharif	Agri. Engg. Rep., Punjab TEVTA
9	Mr.Liaqat Jhamro	Director (Acad)/ Rep., Sindh TEVTA
10	Ms Jawaria Qazi	Web Administrator, PBTE Lahore
11	Mr. Nazakat Hussain	Head, Farm Implement, Millat Tractors
12	Engr. Hira Ishtiaq	Consultant AIMS Engineering, Lahore



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13	Mr. Atif Latif	AD, R&D, P-TEVTA
14	Engr. M. Sohaib	Agriculture Engineer, AMTI, Talagang
15	Engr. Tahreem Javed	SuperPark Engineering Lahore





## National Curriculum Level-5 in Agricultural Machinery Technology



### Report Regarding QVC for the Curriculum of the trade Agricultural Machinery Technology (Level 2-5)



#### Minutes of Meeting

A meeting of Qualification Validation Committee for Review and Validation of Curriculum of "Agriculture Machinery Technology" (Level 2-5) was held at Pakistan Industrial Technical Assistance Center, Lahore from 8<sup>th</sup> – 12<sup>th</sup> Nov, 2021. The following activities took place during meeting:

1. Participants were informed about the validation process.
2. Consultation has been made with the relevant experts to confirm the accuracy of the modules and get their feedback and endorsement.
3. Learning elements were rephrased and missing practical activities were added by experts
4. Material list and learning place were updated according to Learning Unit requirement.
5. Confirmed the accuracy of credit hours for CS as per SBTE, PBTE and NVQF guidelines.
6. The Qualification was finalized in presence of Academic/Industry/TEVTAs/BTEs/QABs to be implemented as a 3 years Diploma (Level 5) course program.
7. The Provisional Qualification awarding bodies in the presence of Provisional TEVTAs approved and recommended for the notification of subject qualification as per approved scheme of study
8. After incorporation all the recommendations of committee in letter and spirit the revised draft was presented before NAVTTTC officials.

The following experts has participated in the Curriculum Review and Validation Committee meeting and showed their consent to validated curriculum as found them according to the requirements of the industry:

	Name	Designation	Signature
1	Mr. Sikandar Masood	Director NAVTTTC/ Coordinator	
2	Mr. Aijaz Ahmad Zia	DACUM Facilitator	
3	Dr. Muhammad Naazir Khan Niazi	Chairman, PBTE Lahore	
4	Mr Muzamil Hussain	AM, RYK PTEVTA	
5	Mr. Muhammad Afzal	Asstt Manager, Millat Tractors, Rawalpindi	
6	Engr. Shahzad Amir Rafiq	Instructor GCT, Sahiwal PTEVTA	
7	Mr. Jamal Akbar	Associate Prof/Rep., KP TEVTA	
8	Engr. Aqib Sharif	Agri. Engg. Rep., Punjab TEVTA	
9	Mr. Liaqat Jhamro	Director (Acad)/ Rep., Sindh TEVTA	
10	Mrs Jawaria Qazi	Web Administrator, PBTE Lahore	
11	Mr. Nazakat Hussain	Head, Farm Implement, Millat Tractors	
12	Engr. Hira Ishtiaq	Consultant AIMS Engineering, Lahore	
13	Mr. Atif Latif	AD, R&D, P-TEVTA	
14	Engr. M. Sohaib	Agriculture Engineer, AMTI, Talagang	
15	Engr. Tahreem Javed	SuperPark Engineering Lahore	