



***National Curriculum Level-3 in Agricultural Machinery Technology***



**National Curriculum Level-3 in Agricultural Machinery Technology**

**“Agricultural Machinery Operator”**



**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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## **National Curriculum Level-3 in Agricultural Machinery Technology**



### **Introduction**

#### **a) Definition/Description of training program Agricultural Machinery Technology (Agricultural Machinery Operator)**

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 Technological 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 Vocational Certificate Level 3 in Agricultural Machinery Technology (Agricultural Machinery Operator) are as follows:

- Improve the professional competence of agricultural machinery work



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- Capacitate the local community and trainers in modern CBT training, methodologies and processes as envisaged under NVQF
- Provide flexible pathways and progressions in the agricultural sector
- Enable the trainees to perform their duties in efficient manner
- Establish a standardized and sustainable system of training for agricultural machinery work across globe

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

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

#### **National Vocational Certificate Level 3 in Agricultural Machinery Technology (Agricultural Machinery Operator)**

1. Perform Basic Manual Drawing
2. Construct electrical circuits and test its parameters by using electrical measuring instruments
3. Perform battery testing and charging operations
4. Perform Basic Lathe Machine Operations
5. Maintain Cooling system
6. Maintain Intake & Exhaust System
7. Operate Tractor
8. Operate land preparation implements
9. Operate sowing and planting implements
10. Operate Wheat Straw Chopper
11. Use Computer System
12. Prepare word document



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13. Prepare spreadsheets
14. Prepare presentation
15. Manage E-mail/Internet
16. Maintain machine documents
17. Perform computer operations
18. Use social media tools for collaboration and engagement
19. Create basic databases
20. Create technical documentation
21. Operate digital media technology

#### **e) 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



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#### f) Trainee entry level:

The entry level for National Vocational Certificate Level 3 in **Agricultural Machinery Technology (Agricultural Machinery Operator)** is given below:

Title	Entry requirements
National Vocational Certificate Level 3 in <b>Agricultural Machinery Technology (Agricultural Machinery Operator)</b>	Entry for assessment for this qualification is open. However, entry into formal training institutes, based on this qualification is a candidate having <b>Level 2 (Agricultural Machinery Helper) or equivalent</b>

#### g) Minimum qualification of trainer:

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

OR

B. B.Sc/B.E Agricultural Engineering

#### h) Recommended trainer: trainee ratio

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

#### i) Medium of instruction i.e. language of instruction:

Instructions will be in Urdu/ English/ Local language.





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**j) Duration of the course (Total time, Theory & Practical time):**

The distribution of contact hours is given below:

<b>Total</b>	<b>-</b>	<b>600 hours</b>
<b>Theory</b>	<b>-</b>	<b>120 hours (20%)</b>
<b>Practical</b>	<b>-</b>	<b>480 hours (80%)</b>

**Proposed Course Duration-6 Months**

**k) Sequence of modules:**

- 1) Module A: Perform Basic Manual Drawing
- 2) Module B: Construct electrical circuits and test its parameters by using electrical measuring instruments
- 3) Module C: Perform battery testing and charging operations
- 4) Module D: Perform Basic Lathe Machine Operations
- 5) Module E: Maintain Cooling system
- 6) Module F: Maintain Intake & Exhaust System
- 7) Module G: Operate Tractor
- 8) Module H: Operate land preparation implements
- 9) Module I: Operate sowing and planting implements
- 10) Module J: Operate Wheat Straw Chopper
- 11) Module K: Use Computer System
- 12) Module L: Prepare word document
- 13) Module M: Prepare spreadsheets



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- 14) Module N: Prepare presentation
- 15) Module O: Manage E-mail/Internet
- 16) Module P: Maintain machine documents
- 17) Module Q: Perform computer operations
- 18) Module R: Use social media tools for collaboration and engagement
- 19) Module S: Create basic databases
- 20) Module T: Create technical documentation
- 21) Module U: Operate digital media technology



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**I) 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-3 (Agricultural Machinery Operator)							
1	Perform Basic Manual Drawing	3	Technical	6	21	27	2.7
2	Construct electrical circuits and test its parameters by using electrical measuring instruments	3	Technical	7	21	28	2.8
3	Perform battery testing and charging operations	3	Technical	3	12	15	1.5
4	Perform Basic Lathe Machine Operations	3	Technical	4	33	37	3.7
5	Maintain Cooling system	3	Technical	4	21	25	2.5
6	Maintain Intake & Exhaust System	3	Technical	4	21	25	2.5
7	Operate Tractor	3	Technical	6	54	60	6



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8	Operate land preparation implements	3	Technical	16	54	70	7
9	Operate sowing and planting implements	3	Technical	14	54	68	6.8
10	Operate Wheat Straw Chopper	3	Technical	3	12	15	1.5
11	Use Computer System	3	Technical	4	12	16	1.6
12	Prepare word document	3	Technical	3	9	12	1.2
13	Prepare spreadsheets	3	Technical	5	15	20	2
14	Prepare presentation	3	Technical	3	9	12	1.2
15	Manage E-mail/Internet	3	Technical	4	6	10	1
16	Maintain machine documents	3	Technical	4	6	10	1
17	Perform computer operations	3	Generic	6	24	30	3
18	Use social media tools for collaboration and engagement	3	Generic	6	24	30	3
19	Create basic databases	3	Generic	6	24	30	3
20	Create technical documentation	3	Generic	6	24	30	3
21	Operate digital media technology	3	Generic	6	24	30	3
	<b>Total</b>			<b>120</b>	<b>480</b>	<b>600</b>	<b>60</b>
	<b>Percentage</b>			<b>20</b>	<b>80</b>		



## Detail of Modules

### Module: 1. Perform Basic Manual Drawing

**Objective:** This Module covers the skills and knowledge required to draw single stroke capital vertical lettering, draw single stroke capital inclined lettering, draw horizontal, vertical and inclined lines, use of compass, circles, half circles, radius, drawing center lines, centers, curves, and crossing of lines, construction of parallel-lines, perpendicular, bisects line, angles and equal division of lines, draw round corners, circles elements, quadrilaterals inside and outside circle and construction of angles and triangles

**Duration: 27 Hours**

**Theory: 6 Hours**

**Practice: 21 Hours**

**Credit Hours: 2.7**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Draw horizontal, vertical and inclined lines.	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Prepare the Drawing sheet.</li> <li>• Select the tools.</li> <li>• Draw the Boundaries lines as per standards.</li> <li>• Make the title bar.</li> </ul>	<b>Knowledge Based Questions</b>  <u>Theory</u> <ul style="list-style-type: none"> <li>• Describe Basic Technical Drawing</li> <li>• Describe Basic Drawing Tools</li> </ul>	Theory- 01 Hrs  Practical- 03 Hrs  Total- 04 Hrs	<ul style="list-style-type: none"> <li>• Drawing Sheet,</li> <li>• Drawing Board,</li> <li>• T Square</li> <li>• Steel Foot Rule,</li> <li>• Protector,</li> <li>• Led Pencil,</li> <li>• Sharpener,</li> <li>• Razer,</li> <li>• Scotch Tape.</li> </ul>	Lab



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	<ul style="list-style-type: none"> <li>Divide the sheets in two equal parts.</li> <li>Draw lines at 30, 45, 60, 90 and 120 angles.</li> </ul>	<b><u>Practical Activity:</u></b> <ol style="list-style-type: none"> <li>Draw the border &amp; title bar on drawing sheet</li> <li>Draw Vertical &amp; horizontal Straight lines</li> <li>Draw lines at 30, 45, 60, 90 and 120 angles.</li> </ol>			
<b>LU2.</b>  Draw single stroke capital vertical lettering	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Prepare the Drawing sheet.</li> <li>Select the tools.</li> <li>Use the dedicated pencil for lettering with the holding techniques.</li> <li>Draw the Boundary lines as per standards.</li> <li>Make the title bar</li> <li>Draw the upper and lower lines for lettering</li> </ul>	<b>Knowledge Based Questions</b>  <b><u>Theory</u></b> <ul style="list-style-type: none"> <li>Describe Basic Technical Drawing</li> <li>Describe Basic Drawing Tools</li> </ul> <b><u>Practical Activity:</u></b> <ol style="list-style-type: none"> <li>Write Vertical Lettering with Gothic style</li> </ol>	Theory- 01 Hrs  Practical- 03 Hrs  Total- 04 Hrs	<ul style="list-style-type: none"> <li>Drawing Sheet, Drawing Board,</li> <li>T Square, Steel Foot Rule,</li> <li>Led Pencil,</li> <li>Sharpener,</li> <li>Razer,</li> <li>Scotch Tape.</li> </ul>	Lab



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	<p>according to the standards.</p> <ul style="list-style-type: none"> <li>Start with writing Vertical Lettering with the different style such as Gothic, Roman and free hand lettering.</li> </ul>	<p>2. Write Vertical Lettering with Roman style</p> <p>3. Write Vertical Lettering with Free hand style</p>			
<p>LU3</p> <p>Draw single stroke capital inclined lettering.</p>	<p>Trainee will be able to</p> <ul style="list-style-type: none"> <li>Prepare the Drawing sheet.</li> <li>Select the tools.</li> <li>Draw Boundaries lines as per standards.</li> <li>Make title bar.</li> <li>Draw the upper and lower lines for lettering according to the standards.</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><u><b>Theory</b></u></p> <ul style="list-style-type: none"> <li>Describe Basic Technical Drawing</li> <li>Describe Basic Drawing Tools</li> <li>Describe the size of Drawing sheet</li> </ul> <p><u><b>Practical Activity:</b></u></p>	<p>Theory- 01 Hrs</p> <p>Practical- 03 Hrs</p> <p>Total- 04 Hrs</p>	<ul style="list-style-type: none"> <li>Drawing Sheet,</li> <li>Drawing Board,</li> <li>T Square,</li> <li>Steel Foot Rule,</li> <li>Led Pencil,</li> <li>Sharpener,</li> <li>Razer,</li> <li>Scotch tape</li> </ul>	Lab



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	<ul style="list-style-type: none"> <li>Start writing with inclined Lettering with various styles such as Gothic, Roman and free hand lettering.</li> </ul>	<ol style="list-style-type: none"> <li>Write Inclined Lettering with Gothic style</li> <li>Write Inclined Lettering with Roman style</li> <li>Write Inclined Lettering with Free hand style</li> </ol>			
<b>LU4</b>  Draw circles, half circles, radius with compass.	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Prepare Drawing sheet.</li> <li>Select the tools.</li> <li>Draw the Boundaries lines as per standards.</li> </ul> <ol style="list-style-type: none"> <li>Make title bar.</li> <li>Divide the sheets in various equal parts.</li> <li>Make the circles and half circles with different diameters</li> </ol>	<b>Knowledge Based Questions</b>  <b>Theory</b> <ul style="list-style-type: none"> <li>Describe Basic Technical Drawing</li> <li>Describe Basic Drawing Tools</li> </ul> <b>Practical Activity:</b> <ol style="list-style-type: none"> <li>Draw the 4 circles of 4,8,12 &amp; 16 cm diameters</li> </ol>	Theory- 01 Hrs  Practical- 03 Hrs  Total- 04 Hrs	<ul style="list-style-type: none"> <li>Drawing Sheet, Drawing Board,</li> <li>T Square, Steel Foot Rule,</li> <li>Led Pencil,</li> <li>Sharpener,</li> <li>Razer,</li> <li>Scotch Tape.</li> <li>Compass,</li> <li>Divider</li> </ul>	Lab





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		2. Draw the 4 half circles of 4,8,12 & 16 cm diameters			
<b>LU5</b>  Draw Lines	<b>Trainee will be able to</b> <ol style="list-style-type: none"> <li>1. Prepare Drawing sheet.</li> <li>2. Select the tools.</li> <li>3. Draw the Boundaries lines as per standards.</li> <li>4. Make the title bar.</li> <li>5. Divide the sheets in two or various equal parts.</li> <li>6. Draw the Center lines.</li> <li>7. Draw the parallel-lines.</li> <li>8. Draw the perpendicular &amp; bisector lines.</li> <li>9. Draw the equal division of lines.</li> <li>10. Make the various curves with different angles</li> <li>11. Draw the crossing line.</li> </ol>	<b>Knowledge Based Questions</b> <p><u><b>Theory</b></u></p> <ul style="list-style-type: none"> <li>• Describe Basic Technical Drawing</li> <li>• Describe Basic Drawing Tools</li> <li>• Describe the size of Drawing sheet</li> </ul> <p><u><b>Practical Activity:</b></u></p> <ol style="list-style-type: none"> <li>1. Draw the Center lines.</li> <li>2. Draw the parallel-lines.</li> <li>3. Draw the perpendicular &amp; bisector lines.</li> </ol>	Theory- 0.5 Hrs  Practical- 03 Hrs  Total- 3.5 Hrs	<ul style="list-style-type: none"> <li>• Drawing Sheet, Drawing Board,</li> <li>• T Square, Steel Foot Rule,</li> <li>• Led Pencil,</li> <li>• Sharpener,</li> <li>• Razer,</li> <li>• Scotch Tape.</li> </ul>	Lab



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		<ol style="list-style-type: none"> <li>4. Draw the equal division of lines.</li> <li>5. Make the various curves with different angles</li> <li>6. Draw the crossing line.</li> </ol>			
<b>LU6</b>  Draw round corners, circles elements, quadrilaterals inside and outside circle.	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Prepare Drawing sheet.</li> <li>• Select the tools.</li> <li>• Draw Boundaries lines as per standards.</li> <li>• Make title bar</li> <li>• Divide the sheets in two or various equal parts.</li> <li>• Make different radius circles.</li> <li>• Make different types of diagrams that touch the circles at the tangent points</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>• Describe Basic Technical Drawing</li> <li>• Describe Basic Drawing Tools</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>1. Draw the 4 circles of 4,8,12 &amp; 16 cm diameters</li> <li>2. Draw a diagram that touch the circle</li> </ol>	Theory- 01Hrs  Practical- 03 Hrs  Total- 04 Hrs	<ul style="list-style-type: none"> <li>• Drawing Sheet, Drawing Board,</li> <li>• T Square, Steel Foot Rule,</li> <li>• Led Pencil,</li> <li>• Sharpener,</li> <li>• Razer,</li> <li>• Scotch Tape.</li> <li>• Compass,</li> <li>• Divider</li> <li>• Protractor</li> </ul>	Lab



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		at the tangent point.			
<b>LU7</b>  Construct angles and triangles	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Prepare Drawing sheet.</li> <li>• Select the tools.</li> <li>• Draw Boundaries lines as per standards.</li> <li>• Make title bar</li> <li>• Divide the sheets in different equal parts.</li> <li>• Draw Equilateral Triangle, Isosceles triangle, Scalene Triangle, Right angle Triangle, Obtuse Triangle, Acute Triangle.</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>• Describe Basic Technical Drawing</li> <li>• Describe Basic Drawing Tools</li> <li>• Describe the size of Drawing sheet</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>1. Draw a Right-angle Triangle</li> <li>2. Draw an Obtuse Triangle</li> <li>3. Draw an Acute Triangle</li> </ol>	Theory- 0.5 Hrs  Practical- 03 Hrs  Total- 3.5 Hrs	<ul style="list-style-type: none"> <li>• Drawing Sheet, Drawing Board,</li> <li>• T Square, Steel Foot Rule,</li> <li>• Led Pencil,</li> <li>• Sharpener,</li> <li>• Razer,</li> <li>• Scotch Tape.</li> <li>• Compass,</li> <li>• Divider</li> <li>• Protractor</li> </ul>	Lab



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### Module: 2. Construct electrical circuits and test its parameters by using electrical measuring instruments

After this Module candidate will be able to interpret and construct basic electrical circuits.

**Duration: 28 Hours**

**Theory: 7 Hours**

**Practice: 21 Hours**

**Credit Hours: 2.8**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Prepare series circuit	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Draw the circuit on the board</li> <li>Attach the bulb and holder according to drawing</li> <li>Connect the wire with holder</li> <li>Attach the circuit with battery</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>Describe basic electricity</li> <li>Define Electric Circuit</li> <li>Describe types of electric circuits</li> <li>Describe different electric measuring instruments</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>Make series circuit on board also attach bulb and holder</li> </ol>	Theory- 1.5 Hrs  Practical- 03 Hrs  Total- 4.5 Hrs	<ul style="list-style-type: none"> <li>Wiring Board</li> <li>Electric wires</li> <li>Bulb</li> <li>Holder</li> <li>battery</li> </ul>	Training Workshop



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		2. Make connection with battery			
<b>LU2.</b>  Prepare parallel circuit	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Draw the circuit on the board</li> <li>• Attach the bulb and holder according to drawing</li> <li>• Connect the wire with holder</li> <li>• Attach the circuit with battery</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>• Describe basic electricity</li> <li>• Define Electric Circuit</li> <li>• Describe types of electric circuits</li> <li>• Describe different electric measuring instruments</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>1. Make parallel circuit on board also attach bulb and holder</li> </ol>	Theory- 1.5 Hrs  Practical- 03 Hrs  Total- 4.5 Hrs	<ul style="list-style-type: none"> <li>• Wiring Board</li> <li>• Electric wires</li> <li>• Bulb</li> <li>• Holder</li> <li>• battery</li> </ul>	Training Workshop



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<b>LU3</b>  Measure the voltage & Resistance	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Select the multimeter and adjust the knob on voltage</li> <li>Attach the probe with circuit and measure the voltage</li> <li>Select the multimeter and adjust the knob on ohm</li> <li>Attach the probe with circuit and measure the resistance</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>Describe basic electricity</li> <li>What is voltage, unit and its formula and how does it work</li> <li>What is resistance, its unit, formula and how does it work</li> <li>Difference between voltage &amp; current</li> </ul> <b>Practical Activity:</b> <ol style="list-style-type: none"> <li>Measure voltage of circuit</li> </ol>	Theory- 01 Hrs  Practical- 03 Hrs  Total- 04 Hrs	<ul style="list-style-type: none"> <li>Wiring Board</li> <li>Electric wires</li> <li>Bulb</li> <li>Holder</li> <li>Battery</li> <li>multimeter</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



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		2. Measure the resistance of circuit			
<b>LU4</b>  Identify Various Diodes	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Identify the Diodes</li> <li>Identify its types &amp; polarities</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>Define diodes and its symbol</li> <li>What is function of diodes?</li> <li>Describe types of diodes</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>What is ideal &amp; practical diode draw its symbol &amp; equivalent circuit</li> </ol>	Theory- 01Hrs  Practical-  03 Hrs  Total-  04 Hrs	<ul style="list-style-type: none"> <li>Diodes</li> <li>Multimeter</li> <li>Probes</li> <li>Wires</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit





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LU5	Trainee will be able to	Knowledge Based Questions			
Identify Resistors in circuit	<ul style="list-style-type: none"> <li>Identify the Resistor &amp; its types</li> <li>Recognize Coding &amp; Color coding of resistor</li> <li>Design series &amp; Parallel circuit of Resistor</li> <li>Use formulae for Series &amp; parallel circuit of resistors</li> </ul>	<p><b>Theory</b></p> <ul style="list-style-type: none"> <li>Define Resistor and explain its types</li> <li>How to resistor work</li> </ul> <p><b>Practical Activity:</b></p> <ol style="list-style-type: none"> <li>Design series circuit of resistor</li> <li>Design parallel circuit of resistor</li> </ol>	<p>Theory- 01 Hrs</p> <p>Practical- 03 Hrs</p> <p>Total- 04 Hrs</p>	<ul style="list-style-type: none"> <li>Resistors</li> <li>Multimeter</li> <li>Probes</li> <li>Wires</li> </ul>	<p>Class Room</p> <p>Training Workshop</p> <p>Lab/ Field Visit</p>



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<b>LU6</b>  Identify Various types of Sensors	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Identify temperature sensors.</li> <li>Identify sound sensors.</li> <li>Identify proximity sensors.</li> <li>Identify pressure sensors.</li> <li>Identify light sensors.</li> <li>Identify position sensors.</li> <li>Identify voltage sensors.</li> <li>Identify current sensors.</li> <li>Identify the vision sensors.</li> <li>Identify infrared (IR) sensors.</li> <li>Identify power requirement for each sensor</li> </ul>	<b>Knowledge Based Questions</b>  <u>Theory</u> <ul style="list-style-type: none"> <li>Define Sensor &amp; Explain different types of sensors</li> </ul> <u>Practical Activity:</u> <ol style="list-style-type: none"> <li>Find out power requirement for each sensor</li> </ol>	Theory-  01 Hrs  Practical-  06 Hrs  Total-  07 Hrs	<ul style="list-style-type: none"> <li>Temperature sensors</li> <li>Sound sensors</li> <li>Proximity sensors</li> <li>Pressure sensors</li> <li>Light sensors</li> <li>Position sensors</li> <li>Voltage sensors</li> <li>Current sensors</li> <li>Vision sensors</li> <li>Infrared (IR) sensors</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit
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## National Curriculum Level-3 in Agricultural Machinery Technology



### Module: 3. Perform battery testing and charging operations

**Overview.** After this module candidate will be able to perform all the tasks in workshop by following the standardized procedure.

**Duration: 15 Hours**

**Theory: 3 Hours**

**Practice: 12 Hours**

**Credit Hours: 1.5**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b> Check electrolyte level and gravity	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Park the vehicle on accurate place</li> <li>• Remove the filler cap</li> </ul>	<b>Knowledge Based Questions</b>  <u>Theory</u> <ul style="list-style-type: none"> <li>• Define electric battery</li> </ul>	Theory- 01Hrs  Practical- 06 Hrs	<ul style="list-style-type: none"> <li>• Electric Battery</li> <li>• Hydrometer</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>Check the electrolyte level and top up if required</li> <li>Check the specific gravity with hydrometer and correct as per the standard</li> </ul>	<ul style="list-style-type: none"> <li>Describe different types of batteries</li> <li>Describe method of checking electrolyte level &amp; gravity</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"> <li>Check the gravity of battery with hydrometer</li> <li>Check electrolyte level of battery with hydrometer</li> </ol>	Total- 07 Hrs		
<b>LU2.</b>  Top up the battery	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Park the vehicle on accurate place</li> <li>Remove the filler cap</li> <li>Check the electrolyte level</li> <li>Pour the electrolyte into the battery</li> </ul>	<b>Knowledge Based Questions</b>  <b><u>Theory</u></b> <ul style="list-style-type: none"> <li>Describe different types of battery</li> <li>Describe electrolyte top-up method in a battery</li> </ul> <p><b><u>Practical Activity:</u></b></p>	Theory- 01 Hrs  Practical- 03 Hrs  Total- 04 Hrs	<ul style="list-style-type: none"> <li>Electric Battery</li> <li>Hydrometer</li> <li>Distilled water/Electrolyte</li> </ul>	Training Workshop



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		1. Check electrolyte level of battery with hydrometer and top up if required			
LU3 Check the voltage	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Set the multimeter on voltage</li> <li>Apply the multimeter probe on battery terminal</li> <li>Record the voltage</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>Define electric battery</li> <li>Describe different types of battery</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>Check voltage with the help of multimeter</li> </ol>	Theory-01 Hrs Practical-03 Hrs Total-04 Hrs	<ul style="list-style-type: none"> <li>Electric Battery</li> <li>Hydrometer</li> <li>Multimeter</li> <li>Probes</li> </ul>	Training Workshop



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### Module: 4. Perform Basic Lathe Machine Operations

**Overview.** This Module covers the skills and knowledge required to Perform centering operations, Perform facing Operations, Perform turning operations, Perform drilling or boring operations, Perform step turning operations, Perform knurling Operations, Taper turning by tail stock off-set method, Taper turning by plain taper turning attachment, Taper turning by telescopic taper turning attachment and Perform Internal and External threading Operations

**Duration: 37 Hours**

**Theory: 4 Hours**

**Practice: 33 Hours**

**Credit Hours: 3.7**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Perform centering operations	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Select the facing tools according to the job requirement.</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u>	Theory-  0.4Hrs  Practical-  03 Hrs	<ul style="list-style-type: none"> <li>Safety goggles</li> <li>Safety harness belt</li> <li>Safety helmet</li> <li>Safety mask</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>Mount and set the required work-holding devices, work piece and cutting tools.</li> <li>Follow the correct specifications for the part or component to be produced.</li> <li>Select the safe procedures and tools to accomplish the work.</li> <li>Adjust the operating parameters (e.g. speed and feed) of machine tool for centering the job.</li> <li>Ensure all safety mechanisms are in followed</li> </ul>	<ul style="list-style-type: none"> <li>Describe lathe machine and its types</li> <li>Describe various operations of lathe machine</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"> <li>Select the safe procedures and tools to accomplish the facing process</li> </ol>	Total- 3.4 Hrs	<ul style="list-style-type: none"> <li>Safety Shoes</li> <li>Lathe machine</li> <li>Cutting tool</li> <li>Chuck key</li> <li>hammer</li> </ul>	
<b>LU2.</b>  Perform facing Operations	<b>Trainee will be able to</b>	<b>Knowledge Based Questions</b>  <b><u>Theory</u></b>	Theory- 0.4Hrs  Practical-	<ul style="list-style-type: none"> <li>Safety goggles</li> <li>Safety harness belt</li> <li>Safety helmet</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>• Select the facing tools according to job requirement.</li> <li>• Mount and set the required work-holding devices, work piece and cutting tools.</li> <li>• Follow the correct specifications for the job / part or component to be produced.</li> <li>• Select safe procedures and tools to accomplish the work.</li> <li>• Adjust the operating parameters (e.g. speed and feed) of machine tool to achieve the work specification.</li> <li>• Ensure all safety mechanisms are followed.</li> </ul>	<ul style="list-style-type: none"> <li>• Describe the type of tool used for facing operation (material and shape)</li> <li>• Explain the position of tool on a tool post</li> </ul> <p><b><u>Practical Activity:</u></b></p> <p>2. Select the safe procedures and tools to accomplish the facing process</p>	<p>03 Hrs</p> <p>Total- 3.4 Hrs</p>	<ul style="list-style-type: none"> <li>• Safety mask</li> <li>• Safety Shoes</li> <li>• Lathe machine</li> <li>• Cutting tool</li> <li>• Chuck key</li> <li>• Hammer</li> </ul>	
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<b>LU3</b>  Perform turning  Operations	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Obtain and follow the work specifications, drawings or sketches to accomplish the work.</li> <li>Set up and adjust the machine as per work specifications and procedures.</li> <li>Ensure the components produced have the required quality and specified dimensional accuracy.</li> <li>Shut down the machine and equipment</li> </ul>	<b>Knowledge Based Questions</b>  <u>Theory</u> <ul style="list-style-type: none"> <li>Describe the type of tool used for turning operation (material and shape)</li> <li>Explain the position of tool on a tool post</li> </ul> <u>Practical Activity:</u> <ol style="list-style-type: none"> <li>3. Select the safe procedures and tools to accomplish the turning process</li> </ol>	Theory- 0.4Hrs  Practical- 03 Hrs  Total- 3.4 Hrs	<ul style="list-style-type: none"> <li>Safety goggles</li> <li>Safety harness belt</li> <li>Safety helmet</li> <li>Safety mask</li> <li>Safety Shoes</li> <li>Lathe machine</li> <li>Cutting tool</li> <li>Chuck key</li> <li>Hammer</li> </ul>	Training Workshop
<b>LU4</b>  Perform drilling  and boring  operations	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Select the drilling or boring tools according to the drawings.</li> <li>Mount and set the required work (holding</li> </ul>	<b>Knowledge Based Questions</b>  <u>Theory</u>	Theory- 0.4Hrs  Practical- 06 Hrs	<ul style="list-style-type: none"> <li>Safety goggles</li> <li>Safety harness belt</li> <li>Safety helmet</li> <li>Safety mask</li> </ul>	Training Workshop



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	<p>devices, work piece and cutting tools)</p> <ul style="list-style-type: none"> <li>Adjust the RPM of machine according to the cutting speed.</li> <li>Perform the boring operation according to the drawing.</li> <li>Check quality of the component produced at different intervals.</li> <li>Observe the personal and workplace safety.</li> </ul>	<ul style="list-style-type: none"> <li>Differentiate between drilling and boring operation</li> <li>Define the working RPM for different jobs</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"> <li>Select the safe procedures and tools to accomplish the boring process</li> </ol>	Total- 6.4 Hrs	<ul style="list-style-type: none"> <li>Safety Shoes</li> <li>Lathe machine</li> <li>Chuck key</li> <li>Cutting tool</li> <li>Boring tool</li> <li>Hammer</li> </ul>	
<b>LU5</b>  Perform step turning operations	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Mount and set the required work-holding devices, work piece and cutting tools.</li> <li>Select and adjust the appropriate speeds and feeds of turning machine.</li> <li>Produce a component which matches the work</li> </ul>	<b>Knowledge Based Questions</b>  <b><u>Theory</u></b> <ul style="list-style-type: none"> <li>Describe step turning operation</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"> <li>Select the safe procedures and tools to accomplish</li> </ol>	Theory- 0.4Hrs  Practical- 03 Hrs  Total- 3.4 Hrs	<ul style="list-style-type: none"> <li>Safety goggles</li> <li>Safety harness belt</li> <li>Safety helmet</li> <li>Safety mask</li> <li>Safety Shoes</li> <li>Lathe machine</li> <li>Cutting tool</li> <li>Chuck key</li> <li>Hammer</li> </ul>	Training Workshop



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	<p>specifications using appropriate methods and techniques.</p> <ul style="list-style-type: none"> <li>• Check the quality of the component produced at various intervals.</li> <li>• Follow the safety precautions to ensure safe work and to avoid any injury.</li> </ul>	the step turning process			
<b>LU6</b>  Perform knurling Operations	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Select the knurling tool according to drawing.</li> <li>• Set the tool and work piece in the machine according to the procedure.</li> <li>• Adopt the methods and techniques in order to produce proper knurling on the work piece.</li> </ul>	<b>Knowledge Based Questions</b>  <u>Theory</u> <ul style="list-style-type: none"> <li>• Explain the need of knurling operation</li> </ul> <u>Practical Activity:</u> <ol style="list-style-type: none"> <li>1. Select the safe procedures and tools to accomplish the knurling process</li> </ol>	Theory- 0.4Hrs  Practical- 03 Hrs  Total- 3.4 Hrs	<ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Safety harness belt</li> <li>• Safety helmet</li> <li>• Safety mask</li> <li>• Safety Shoes</li> <li>• Lathe machine</li> <li>• Knurling tool</li> <li>• Chuck key</li> <li>• hammer</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>• Select and adjust an appropriate speeds and feeds of the lathe machine.</li> <li>• Use the coolants during knurling to achieve a smooth impression on the work piece.</li> <li>• Observe the personal and workplace safety.</li> </ul>				
<b>LU7</b>  Perform Taper turning by tail stock off-set method	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Loosen the tailstock clamp out.</li> <li>• Offset tailstock required amount.</li> <li>• Centre the cutting tool.</li> <li>• Setup the cutting tool for a parallel turning.</li> <li>• Check the taper for an accuracy using the taper ring gauge.</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>• Define taper turning operation by tail stock off-set method</li> <li>• Describe the adjustment of angle for turning</li> </ul> <u><b>Practical Activity:</b></u>	Theory- 0.4Hrs  Practical- 03 Hrs  Total- 3.4 Hrs	<ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Safety harness belt</li> <li>• Safety helmet</li> <li>• Safety mask</li> <li>• Safety Shoes</li> <li>• Lathe machine</li> <li>• Cutting tool</li> <li>• Chuck key</li> <li>• Hammer</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>Finish and turn the taper according to the required size in order to fit</li> </ul>	<ol style="list-style-type: none"> <li>Select the safe procedures and tools to accomplish the taper turning process</li> </ol>			
<b>LU8</b>  Perform Taper turning by plain taper turning attachment	<ul style="list-style-type: none"> <li>Remove the binding screw that cross the slide to cross the feed screw and nut.</li> <li>Tighten the lock screw and set the cutting tool in the center.</li> <li>Set the workpiece in the lathe machine and mark the length of taper.</li> <li>Use the binding screw in order to connect the sliding block and side of taper's attachment.</li> <li>Select the depth of a feed cut by the compound rest and feed handle.</li> </ul>	<b>Knowledge Based Questions</b>  <u>Theory</u> <ul style="list-style-type: none"> <li>Define taper turning operation by plain taper turning attachment</li> <li>Describe the adjustment of angle for turning</li> </ul> <u>Practical Activity:</u> <ol style="list-style-type: none"> <li>Select the safe procedures and tools to accomplish the taper turning process</li> </ol>	Theory- 0.4Hrs  Practical- 03 Hrs  Total- 3.4 Hrs	<ul style="list-style-type: none"> <li>Safety goggles</li> <li>Safety harness belt</li> <li>Safety helmet</li> <li>Safety mask</li> <li>Safety Shoes</li> <li>Lathe machine</li> <li>Chuck key</li> <li>hammer</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>Take a light cut and recheck the taper fit.</li> <li>Finish the turn and fit the taper to a gauge.</li> </ul>				
<b>LU9</b>  Perform Taper turning by telescopic taper turning attachment	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Clean and oil the guide bar.</li> <li>Loose lock screws and offset end of guide bar,</li> <li>Set the bar to required taper in degrees.</li> <li>Tighten the lock screw and set cutting tool on center.</li> <li>Set the workpiece in lathe and mark the length of a taper and tighten the connecting screw on a sliding block.</li> <li>Move the carriage until the center of attachment is opposite to the length of taper.</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>Define taper turning operation by telescopic taper turning attachment</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>Select the safe procedures and tools to accomplish the turning process</li> </ol>	Theory- 0.4Hrs  Practical- 03 Hrs  Total- 3.4 Hrs	<ul style="list-style-type: none"> <li>Safety goggles</li> <li>Safety harness belt</li> <li>Safety helmet</li> <li>Safety mask</li> <li>Safety Shoes</li> <li>Lathe machine</li> <li>Chuck key</li> <li>hammer</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>• Lock the anchor and bracket to the lathe bed.</li> <li>• Take a cut and select the depth of a cut.</li> <li>• Readjust the taper attachment, Take a light cut and recheck the taper fit.</li> <li>• Finish the turn and fit the taper to a gauge.</li> </ul>				
<b>LU10</b>  Perform Internal and External threading Operations	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Mount and set the required work-holding devices, work piece and cutting tools.</li> <li>• Select and adjust the appropriate speeds and feeds of the turning machine.</li> <li>• Produce a component which matches the work specifications using an</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>• Define Internal and External threading Operations</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>1. Select the safe procedures and tools to accomplish the threading process</li> </ol>	Theory- 0.4Hrs  Practical- 03 Hrs  Total- 3.4 Hrs	<ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Safety harness belt</li> <li>• Safety helmet</li> <li>• Safety mask</li> <li>• Safety Shoes</li> <li>• Lathe machine</li> <li>• Chuck key</li> <li>• Cutting tool</li> <li>• Boring tool</li> <li>• Cutting oil</li> </ul>	Training Workshop



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	<p>appropriate methods and techniques.</p> <ul style="list-style-type: none"><li>• Check the quality of a component produced at the various t intervals.</li><li>• Use the Proper cutting tool with a required dimensions.</li><li>• Follow the safety precautions in order to ensure safe working environment to avoid accidents and injuries.</li></ul>				
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### Module: 5. Maintain Cooling system

**Overview.** After this module candidate will be able to service the cooling system of Prime Mover

**Duration: 25 Hours**

**Theory: 4 Hours**

**Practice: 21 Hours**

**Credit Hours: 2.5**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Replace the Radiator	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Open the Drain plug</li> <li>• Remove the upper &amp; lower house pipe</li> <li>• Remove the fan shroud</li> <li>• Open the radiator bolt</li> </ul>	<b>Knowledge Based Questions</b>  <u>Theory</u>	Theory- 0.5 Hrs  Practical- 06 Hrs  Total-	<ul style="list-style-type: none"> <li>• Water pump</li> <li>• Thermostat</li> <li>• Radiator</li> <li>• Cooling fan</li> <li>• Heater core</li> <li>• Pressure cap</li> <li>• Overflow tank</li> <li>• Hoses</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>Remove the Radiator from Prime Mover</li> <li>Install the radiator</li> <li>Clamp the upper &amp; lower house pipes</li> </ul>	<ul style="list-style-type: none"> <li>Define working principle of cooling system</li> <li>Describe types and major components of cooling system</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"> <li>Remove the Radiator from Prime Mover</li> <li>Install the radiator</li> <li>Clamp the upper &amp; lower house pipes</li> </ol>	6.5 Hrs	<ul style="list-style-type: none"> <li>Screw driver</li> <li>Spanner</li> <li>Coolant</li> </ul>	
<b>LU2.</b>  Replace the Water Pump	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Remove the drive belt by losing belt adjuster</li> <li>Drain the Coolant from Radiator</li> <li>Remove the housing pipe</li> <li>Remove the nuts/bolts from water pump housing</li> </ul>	<b>Knowledge Based Questions</b> <p><b><u>Theory</u></b></p> <ul style="list-style-type: none"> <li>Define working principle of cooling system</li> </ul>	Theory- 0.5Hrs  Practical- 06 Hrs  Total- 6.5Hrs	<ul style="list-style-type: none"> <li>Water pump</li> <li>Thermostat</li> <li>Radiator</li> <li>Cooling fan</li> <li>Heater core</li> <li>Pressure cap</li> <li>Overflow tank</li> <li>Hoses</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>Remove the Water pump from housing</li> <li>Clean the surface of cylinder block and water pump housing</li> <li>Insert gasket in the housing</li> <li>Install the Water pump in housing</li> </ul>	<ul style="list-style-type: none"> <li>Describe types and major components of cooling system</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"> <li>1. Install the Water pump in housing</li> </ol>			
<b>LU3</b>  Replace the Thermostat valve	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Open the Drain Plug</li> <li>Remove the upper Hose pipe from thermostat housing</li> <li>remove the housing of thermostat valve by opening bolt</li> <li>Remove &amp; inspect working the thermostat valve</li> </ul>	<b>Knowledge Based Questions</b>  <p><b><u>Theory</u></b></p> <ul style="list-style-type: none"> <li>Define the function of thermostat valve</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"> <li>1. Replace the thermostat valve</li> </ol>	Theory-  01 Hrs  Practical-  03 Hrs  Total-  04 Hrs	<ul style="list-style-type: none"> <li>Screw driver</li> <li>Spanner</li> <li>Creeper</li> <li>Silicon</li> <li>Joint</li> </ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>• Clean the housing surface with scraper</li> <li>• Insert new gasket in the housing</li> <li>• Install the thermostat valve</li> <li>• Install the thermostat housing and upper hose pipe</li> </ul>				
<b>LU4</b>  Replace the coolant	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Remove radiator cap</li> <li>• Remove the drain plug on idling speed of engine</li> <li>• Remove all the rusted coolant from cooling system</li> <li>• Install the drain plug of radiator</li> <li>• Top up the cooling system with coolant</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>• Explain the properties of coolant</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>1. Replace the coolant</li> </ol>	Theory-  01 Hrs  Practical-  03 Hrs  Total-  04 Hrs	<ul style="list-style-type: none"> <li>• Screw driver</li> <li>• Spanner</li> <li>• Silicon</li> <li>• Coolant</li> </ul>	Training Workshop



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<b>LU5</b>  Remove the temperature gauge	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Remove the connection of Temperature gauge</li> <li>Replace the temperature gauge</li> <li>Remove the rusting / dust from the switch</li> <li>Connect the temperature gauge and ground it</li> <li>Install the temperature gauge</li> </ul>	<ul style="list-style-type: none"> <li>Describe the function of temperature gauge</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"> <li>Replace the temperature gauge</li> </ol>	Theory- 01Hrs  Practical- 03 Hrs  Total- 04 Hrs	<ul style="list-style-type: none"> <li>Screw driver</li> <li>Spanner</li> </ul>	Training Workshop
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**Module: 6. Maintain Intake & Exhaust System**

**Overview.** After this Module candidate will be able to maintain the intake and exhaust system of Prime Mover

**Duration: 25 Hours**

**Theory: 4 Hours**

**Practice: 21 Hours**

**Credit Hours: 2.5**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Service the Air cleaner	Trainee will be able to: <ul style="list-style-type: none"><li>Remove the pre- air cleaner</li><li>Clean the pre- air cleaner</li></ul>	Knowledge Based <u>Theory</u>	Theory- 1.5 Hrs  Practical-	<ul style="list-style-type: none"><li>Screw driver</li><li>Kerosene oil</li><li>Cotton waste</li></ul>	Training Workshop



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	<ul style="list-style-type: none"> <li>• Install Pre-air cleaner</li> <li>• Remove the clamps of hose pipe and air cleaner</li> <li>• Wash the air cleaner with kerosene oil</li> <li>• Wash the air cleaner with water</li> <li>• Install the air cleaner</li> <li>• Top up the cleaner with oil</li> </ul>	<ul style="list-style-type: none"> <li>• Define the functions of air cleaner</li> </ul> <p><b><u>Practical Activity:</u></b></p> <p>1. Service the air cleaner</p>	<p>06 Hrs</p> <p>Total- 7.5 Hrs</p>	<ul style="list-style-type: none"> <li>• Air bath Oil</li> </ul>	
<p><b>LU2.</b></p> <p>Maintain turbo charger</p>	<p><b>Trainee will be able to</b></p> <ul style="list-style-type: none"> <li>• Remove the exhaust elbow from Turbo charger</li> <li>• Remove the hose pipe from Turbo charger</li> <li>• Remove the Lubrication pipes from Turbo charger</li> <li>• Remove turbo charger from exhaust manifold</li> <li>• Remove the clamp of Compressor body of turbocharger</li> <li>• Dismantle the core assembly</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><b><u>Theory</u></b></p> <ul style="list-style-type: none"> <li>• Define the functions of turbo charger</li> </ul> <p><b><u>Practical Activity:</u></b></p> <p>1. Service the turbo charger</p>	<p>Theory- 1.5 Hrs</p> <p>Practical- 09 Hrs</p> <p>Total- 10.5 Hrs</p>	<ul style="list-style-type: none"> <li>• Screw driver</li> <li>• Kerosene oil</li> <li>• Cotton waste</li> </ul>	<p>Training Workshop</p>



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	<ul style="list-style-type: none"> <li>• Clean the Core assembly</li> <li>• Assemble the turbo charger</li> <li>• Install the turbo charger</li> </ul>				
<b>LU3</b>  Service the inlet-manifold	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Remove the hosepipe</li> <li>• Remove the electric connections of Thermo-starter</li> <li>• Remove the fuel pipes of Thermo-starter</li> <li>• Remove the fuel line from inlet manifold</li> <li>• Clean the surface with scraper</li> <li>• Place the joint-kit</li> <li>• Install the inlet manifold</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>• Define the function of intake manifold</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>1. Service the inlet-manifold</li> </ol>	Theory- 01 Hrs  Practical- 06 Hrs  Total- 07 Hrs	<ul style="list-style-type: none"> <li>• Screw driver</li> <li>• Spanner</li> <li>• Kerosene oil</li> <li>• Cotton waste</li> </ul>	Training Workshop





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### Module: 7. Operate Tractor

**Overview.** After this module candidate will be able to operate tractor in different field conditions

**Duration: 60 Hours**

**Theory: 6 Hours**

**Practice: 54 Hours**

**Credit Hours: 6**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Interpret the Highway code	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Interpret the cautionary road signs</li> <li>Interpret the informatory road signs</li> <li>Interpret the compulsory road signs</li> <li>Enlist the safety measures of tractor Operation</li> <li>Interpret the Road lanes</li> <li>Enlist safety measures regarding different weather conditions</li> <li>Enlist safety measures regarding different road conditions</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>Describe the sign and symbols of road usage</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>Interpret the cautionary sign of road usage</li> </ol>	Theory- 02 Hrs  Practical- 12 Hrs  Total- 14 Hrs	<ul style="list-style-type: none"> <li>Highway code</li> </ul>	Class Room  Training Workshop  Lab/ Field Visit



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<b>LU2.</b>  Troubleshoot the tractor starting	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Perform the cockpit drill</li> <li>• Inspect the Electric connections and repair if needed</li> <li>• Remove the Fuel Air locking</li> <li>• inspect the Pre Heating system and replace glow plug if needed</li> <li>• Select the proper RPM for specific operation</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>• Describe the functions of glow plug</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>1. Replace the glow plug</li> </ol>	Theory- 01 Hrs  Practical- 15Hrs  Total- 16 Hrs	<ul style="list-style-type: none"> <li>• Tractor</li> <li>• Spanner</li> <li>• Cotton waste</li> <li>• Kerosene oil</li> <li>• Diesel</li> <li>•</li> </ul>	Field
<b>LU3</b>  Hitch the implement	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Align the tractor (3-point linkage) with Implement</li> <li>• Connect the linkages with given implement</li> <li>• Connect the PTO shaft</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>• Functions of three point linkages</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>1. Hitch the Rotavator</li> </ol>	Theory- 01 Hrs  Practical- 12 Hrs  Total- 13 Hrs	<ul style="list-style-type: none"> <li>• Tractor</li> <li>• Rotavator</li> <li>• Hydraulic</li> <li>• Top link</li> <li>• Air pin</li> <li>•</li> </ul>	Field



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<b>LU4</b>  Operate the Tractor	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Draw the cultivation field plan for MB plough on given field</li> <li>• Operate Disc plough</li> <li>• Operate Rotavator</li> <li>• Operate the Boom Sprayer</li> <li>• Drive on road tractor with trolley</li> <li>• Operate tractor with front / rear blade</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>• Describe Traction</li> <li>• Rated RPM of tractor</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>1. Operate disc plough</li> </ol>	Theory-  02 Hrs  Practical-  15 Hrs  Total-  17 Hrs	<ul style="list-style-type: none"> <li>• Tractor</li> <li>• Boom sprayer</li> <li>• Trolley</li> <li>• Rear blade</li> <li>• Disc plough</li> </ul>	Field
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## National Curriculum Level-3 in Agricultural Machinery Technology



### Module: 8. Operate land preparation implements

**Overview:** After this Module candidate will be able to operate farm equipment's which are used in agriculture.

**Duration: 70 Hours**

**Theory: 16 Hours**

**Practice: 54 Hours**

**Credit Hours: 7**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b> Identify land preparation implements	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Identify plain-bed implements (cultivators, planker)</li> <li>Identify bed-furrow implements (bed-shaper, bed-furrow maker)</li> <li>Identify ridge-furrow implements (ridger)</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>Define functions of land preparation implements</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>Identify ridge-furrow implements</li> </ol>	Theory- 06 Hrs  Practical- 18 Hrs  Total- 24 Hrs	<ul style="list-style-type: none"> <li>Bed shaper</li> <li>Ridger</li> <li>Cultivator</li> <li>planker</li> </ul>	Training Workshop
<b>LU2.</b> Plan field operations	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Draw sketch of the field</li> <li>Assess the field conditions</li> <li>Prepare work plan for operation</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u>	Theory- 04 Hrs  Practical- 18 Hrs	Drawing sheet Lead pencil Raser Sharpener Steel foot rule	Class Room  Training Workshop  Lab/ Field Visit



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	<ul style="list-style-type: none"> <li>Estimate the required inputs</li> </ul>	<ul style="list-style-type: none"> <li>Explain methods of field sketching</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"> <li>Draw sketch of the field</li> </ol>	Total- 22 Hrs		
<p>LU3</p> <p>Use land preparation implements</p>	<p><b>Trainee will be able to</b></p> <ul style="list-style-type: none"> <li>Inspect implements</li> <li>Use of plain-bed implements</li> <li>Use of bed-furrow implements</li> <li>Use of ridge-furrow implements</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><b><u>Theory</u></b></p> <ul style="list-style-type: none"> <li>Enlist types of land preparations implements</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"> <li>Use of ridge-furrow implements</li> </ol>	<p>Theory- 06 Hrs</p> <p>Practical- 18 Hrs</p> <p>Total- 24 Hrs</p>	<ul style="list-style-type: none"> <li>Tractor</li> <li>Bed shaper</li> <li>Ridger</li> <li>Cultivator</li> <li>planker</li> </ul>	Training Workshop



## National Curriculum Level-3 in Agricultural Machinery Technology



### Module: 9      Operate sowing and planting implements

**Overview:** After this Module candidate will be able to learn to operate the different sowing and planting implements according to the crop seed.

**Duration: 68 Hours**

**Theory: 14 Hours**

**Practice: 54 Hours**

**Credit Hours: 6.8**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Operate sugarcane planter	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Identify planter parts (main frame, gear box, PTO shaft, dual movement cutter frame, stationary cutter frame, hopper, ridger, stems tube)</li> <li>Attach implement with 3-point linkage system of tractor.</li> <li>Load the sugarcane stems in hopper.</li> <li>Run the tractor.</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>Describe method of sugarcane planting</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>Operate the sugarcane planter</li> </ol>	Theory- 04 Hrs  Practical- 15 Hrs  Total- 19 Hrs	<ul style="list-style-type: none"> <li>Safety goggles</li> <li>Safety helmet</li> <li>Safety mask</li> <li>Safety Shoes</li> <li>Sugarcane planter</li> <li>Tractor</li> </ul>	Field



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<p><b>LU2.</b></p> <p>Operate potato planter</p>	<p><b>Trainee will be able to</b></p> <ul style="list-style-type: none"> <li>Identify different parts of potato planter (main frame, hopper, potato bucket conveyor, ridger, fluted wheels, potato tube)</li> <li>Attach implement with 3-point linkage system of 50Hp tractor.</li> <li>Load dried pieces of potatoes into the potato seed hopper and fertilizer into fertilizer container.</li> <li>Run the tractor.</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 function of potato planter</li> </ul> <p><u><b>Practical Activity:</b></u></p> <p>1. Operate potato planter</p>	<p>Theory- 04 Hrs</p> <p>Practical- 15 Hrs</p> <p>Total- 19 Hrs</p>	<ul style="list-style-type: none"> <li>Safety goggles</li> <li>Safety helmet</li> <li>Safety mask</li> <li>Safety Shoes</li> <li>Potato planter</li> <li>Tractor</li> </ul>	<p>Field</p>
<p><b>LU3</b></p> <p>Operate wheat drill</p>	<p><b>Trainee will be able to</b></p> <ul style="list-style-type: none"> <li>Identify different parts of wheat seed drill (Frame, Seed metering device; Furrow opener; Covering device; Rotating wheel; Seed tubes; Clutch).</li> <li>Replace any broken or worn out parts.</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 functions and calibration of wheat drill</li> </ul> <p><u><b>Practical Activity:</b></u></p> <p>1. Operate wheat drill</p>	<p>Theory- 03 Hrs</p> <p>Practical- 12 Hrs</p> <p>Total- 15 Hrs</p>	<ul style="list-style-type: none"> <li>Safety goggles</li> <li>Safety helmet</li> <li>Safety mask</li> <li>Safety Shoes</li> <li>Wheat drill</li> <li>Tractor</li> </ul>	<p>Field Visit</p>



# National Curriculum Level-3 in Agricultural Machinery Technology



	<ul style="list-style-type: none"> <li>• Attach implement with 3-point linkage system of 50Hp tractor.</li> <li>• Add the seed to the seed box</li> <li>• Calibrate the seed drill.</li> <li>• Adjust seed rate and planting depth.</li> </ul>				
<b>LU4</b>  Operate post hole Digger	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Select appropriate auger size</li> <li>• Align the three point linkages with post hole digger</li> <li>• Attach post hole digger with tractor</li> <li>• Maintain suitable PTO RPM</li> <li>• Dig hole using post hole digger</li> <li>• Lubricate the drive shaft and gear box</li> </ul>	<b>Knowledge Based Questions</b>  <b>Theory</b> <ul style="list-style-type: none"> <li>• Describe the functions of post hole digger</li> </ul> <b>Practical Activity:</b> <ol style="list-style-type: none"> <li>1. Operate post hole digger</li> </ol>	Theory- 03 Hrs Practical- 12 Hrs Total- 15 Hrs	<ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Safety helmet</li> <li>• Safety mask</li> <li>• Safety Shoes</li> <li>• Post hole digger</li> <li>• Tractor</li> </ul>	Field Visit





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### Module: 10      Operate Wheat Straw Chopper

**Overview:** After this Module candidate will be able to manage and operate wheat straw chopper.

**Duration: 15 Hours**

**Theory: 3 Hours**

**Practice: 12 Hours**

**Credit Hours: 1.5**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1</b> Identify Wheat straw chopper	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Identify different types of farm choppers</li> <li>Identify wheat straw chopper components (Cutter bar, auger, conveyer belts, blower, tractor, PTO shaft, cross shaft, trolley, threshing unit with blades)</li> <li>Observe the field before operating wheat straw chopper</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>Describe the importance of wheat straw chopping</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>Identify different systems of straw chopper</li> </ol>	Theory- 01Hrs Practical- 03 Hrs Total- 04 Hrs	<ul style="list-style-type: none"> <li>Wheat straw chopper</li> </ul>	Training Workshop  Field



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<b>LU2.</b>  Operate Wheat straw chopper	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Attach wheat straw chopper with tractor PTO</li> <li>• Set the tractor PTO to deliver 540rpm.</li> <li>• Perform idle running of Wheat straw chopper</li> <li>• Perform cutting operation of crop residue</li> <li>• Ensure chopping of straw</li> <li>• Ensure chopped material transferred to trolley</li> <li>• Unload the trolley from chopped the material</li> <li>• Ensure crop stalk in corners is also collected</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>• Describe the attachment procedure of wheat straw chopper</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>1. Operate Wheat straw chopper</li> </ol>	Theory- 01 Hrs  Practical- 06 Hrs  Total- 07 Hrs	<ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Safety helmet</li> <li>• Safety mask</li> <li>• Safety Shoes</li> <li>• Wheat straw chopper</li> <li>• Tractor</li> </ul>	Field
<b>LU3</b>  Maintain Wheat straw chopper	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Inspect wheat straw chopper cutter bar</li> <li>• Inspect tension of conveyer belts,</li> <li>• Inspect tractor PTO shaft and cross shaft</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>• Describe various Components and function of wheat straw chopper</li> </ul>	Theory- 01 Hrs  Practical- 03 Hrs  Total-	<ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Safety helmet</li> <li>• Safety mask</li> <li>• Safety Shoes</li> <li>• Wheat straw chopper</li> </ul>	Training Workshop  Lab/ Field



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	<ul style="list-style-type: none"><li>• Inspect threshing drum blades</li><li>• Inspect greasing of PTO shaft, wheels hub and tandem shaft</li><li>• Replace cutter bar blades on wear and tear</li><li>• Replace threshing drum tips/ blades on wear and tear</li><li>• Replace blower (If required)</li></ul>	<p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"><li>1. Replace cutter bar blades on wear and tear</li><li>2. Replace threshing drum tips/ blades on wear and tear</li></ol>	04 Hrs	<ul style="list-style-type: none"><li>• Spanner</li><li>• Hammer</li><li>• Plier</li><li>• Screw driver</li><li>• Grease gun</li><li>• Grease</li><li>• Cotton waste</li></ul>	
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**Module: 11. Use Computer System**

**Overview:** After this Module candidate will be able to operate and maintain the computer system.

**Duration: 16 Hours**

**Theory: 4 Hours**

**Practice: 12 Hours**

**Credit Hours: 1.6**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1</b>  Identify basic parts of a computer	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Identify the input devices</li> <li>Identify the output devices</li> <li>Identify Mass storage devices</li> <li>Identify the basic operating systems</li> </ul>	<b>Knowledge Based Questions</b>  <b>Theory</b> <ul style="list-style-type: none"> <li>What is computer</li> <li>Define input device</li> <li>Define output device</li> <li>Define Mass storage Devices</li> </ul> <b>Practical Activity:</b> <ol style="list-style-type: none"> <li>Physically separate input &amp; output devices</li> <li>Attached printer with computer and take a print</li> </ol>	Theory- 01 Hrs  Practical- 03 Hrs  Total- 04 Hrs	<ul style="list-style-type: none"> <li>Complete Computer System / Laptop (CPU, LCD</li> <li>Mouse</li> <li>Key Board</li> <li>Data Cables)</li> <li>Input &amp; Output Devices (Speaker</li> <li>USP</li> <li>Printer</li> <li>Scanner</li> <li>Mouse</li> <li>Keyboard)</li> </ul>	Computer Lab



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<p><b>LU2.</b></p> <p>Use peripheral devices of computer</p>	<p><b>Trainee will be able to</b></p> <ul style="list-style-type: none"> <li>• Use input devices</li> <li>• Use output devices</li> <li>• Use Mass storage devices</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><u><b>Theory</b></u></p> <ul style="list-style-type: none"> <li>• What is computer</li> <li>• Define input device</li> <li>• Define output device</li> <li>• Define Mass storage Devices</li> </ul> <p><u><b>Practical Activity:</b></u></p> <ol style="list-style-type: none"> <li>1. Physically separate input &amp; output devices</li> <li>2. Attached printer with computer and take a print</li> <li>3. Use Mouse as a input device</li> </ol>	<p>Theory- 01 Hrs</p> <p>Practical- 03 Hrs</p> <p>Total- 04 Hrs</p>	<ul style="list-style-type: none"> <li>• Complete Computer System / Laptop (CPU, LCD Mouse Key Board Data Cables)</li> <li>• Input &amp; Output Devices (Speaker USP Printer Scanner Mouse Keyboard)</li> </ul>	<p>Computer Lab</p>
<p><b>LU3</b></p> <p>Install windows and software</p>	<p><b>Trainee will be able to</b></p> <ul style="list-style-type: none"> <li>• Perform window installation</li> <li>• Perform MS office installation</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><u><b>Theory</b></u></p> <ul style="list-style-type: none"> <li>• Define Software &amp; Hard Ware</li> </ul>	<p>Theory- 02 Hrs</p> <p>Practical- 06 Hrs</p>	<ul style="list-style-type: none"> <li>• Complete Computer System / Laptop (CPU, LCD Mouse Key Board Data Cables)</li> <li>• Input &amp; Output Devices (Speaker</li> </ul>	<p>Computer Lab</p>



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	<ul style="list-style-type: none"><li>• Install software applications</li><li>• Perform antivirus installation</li><li>• Format mass storage devices</li><li>• Troubleshoot basic software errors</li></ul>	<ul style="list-style-type: none"><li>• Define MS Office</li><li>• Define Antivirus</li><li>• Define Mass storage</li></ul> <p><b>Practical Activity:</b></p> <ol style="list-style-type: none"><li>1. Install Window 2010</li><li>2. Install MS office 2010</li></ol>	Total- 08 Hrs	UPS, Printer, Scanner, Mouse, Keyboard)	
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**Module: 12. Prepare Word Document**

**Overview:** After this Module candidate will be able to prepare and manage the word documents files.

**Duration: 12 Hours**

**Theory: 3 Hours**

**Practice: 9 Hours**

**Credit Hours: 1.2**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1</b>  Setup a page in word	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Identify the components of page layout</li> <li>Use margins</li> <li>Use orientation</li> <li>Use size of page</li> <li>Use columns</li> <li>Use page break</li> <li>Use line numbers</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>How do you set up a page on Microsoft Word</li> <li>Where is Page Setup in Word</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>Draw a page using components margins,</li> <li>Orientation, size of page</li> <li>Columns.</li> </ol>	Theory- 0.5 Hrs  Practical- 03Hrs  Total- 3.5 Hrs	Desktop computer/ Laptop	Computer Lab





# National Curriculum Level-3 in Agricultural Machinery Technology



LU2.	Trainee will be able to	Knowledge Based Questions		Desktop computer/ Laptop	Computer Lab
Edit and format word document	<ul style="list-style-type: none"> <li>Identify the components to edit word document</li> <li>Use save document</li> <li>Use cut text in document</li> <li>Use copy text in document</li> <li>Use paste text in document</li> <li>Use format painter</li> <li>Identify components for format word document</li> <li>Use font style</li> <li>Use font size</li> <li>Use font alignment</li> <li>Use line spacing</li> <li>Use bold text</li> <li>Use italic text</li> <li>Use underline text</li> </ul>	<p><b>Theory</b></p> <ul style="list-style-type: none"> <li>How to edit word document</li> <li>How to cut, paste a word</li> <li>How to change format</li> <li>What are the components for format word documents?</li> <li>What are short keys for format toolbar</li> </ul> <p><b>Practical Activity:</b></p> <ol style="list-style-type: none"> <li>Practice to save document file</li> <li>Practice how to cut text</li> <li>Practice how to save text</li> </ol>	<p>Theory- 02 Hrs</p> <p>Practical- 03Hrs</p> <p>Total- 05 Hrs</p>		



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		4. Practice how to paste text 5. Practice of font styles 6. Practice of font size 7. Practice of font alignment 8. Practice of line spacing 9. Practice of bold text 10. Practice of italic text 11. Practice of underline text			
<b>LU4</b>  Use of Insert in the word file	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Identify the components of the insert in a word document</li> <li>Add cover page</li> <li>Insert a picture in a word file</li> </ul>	<b>Knowledge Based Questions</b>  <b>Theory</b> <ul style="list-style-type: none"> <li>What is insert in word</li> <li>How do you insert a document into Word</li> </ul>	Theory- 0.5 Hrs  Practical- 03 Hrs  Total-	Desktop computer/  Laptop	Computer Lab



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	<ul style="list-style-type: none"><li>• Make a table in a word file</li><li>• Add clip art in document</li><li>• Insert shapes</li><li>• Insert SmartArt</li><li>• Make chart</li><li>• Use header</li><li>• Use footer</li><li>• Use page number</li></ul>	<p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"><li>1. Practice of editing and formatting of word page</li><li>2. Practice to insert a picture, shape, page number, chart and smart art</li><li>3. Practice to use Header &amp; Footer</li></ol>	3.5 Hrs		
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## National Curriculum Level-3 in Agricultural Machinery Technology



### Module: 13. Prepare Spreadsheets

**Overview:** After this Module candidate will be able to prepare spreadsheet

**Duration: 20 Hours**

**Theory: 5 Hours**

**Practice: 15Hours**

**Credit Hours: 2**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Identify Main parts of a spreadsheet	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Identify cell in a workbook</li> <li>Identify ribbon</li> <li>Identify row heading</li> <li>Identify column heading</li> <li>Identify the formula bar</li> <li>Identify worksheet</li> <li>Identify work area identify view buttons</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>What is Excel and what is it used for</li> <li>What is meant by Excel sheet</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>Practice of making spread sheet</li> <li>Practice of making rows and columns</li> </ol>	Theory- 01Hrs  Practical- 03 Hrs  Total- 04 Hrs	Desktop computer/ Laptop	Computer Lab
<b>LU2.</b>  Use basic formula	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Use summation formula</li> <li>Use subtraction formula</li> <li>Use multiply formula</li> <li>Use division formula</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u>	Theory- 02 Hrs  Practical-	Desktop computer/  Laptop	Computer Lab



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	<ul style="list-style-type: none"> <li>• Use the average formula</li> <li>• Use Maximum formula</li> <li>• Use minimum formula</li> <li>• Use word count formula</li> </ul>	<ul style="list-style-type: none"> <li>• What is a basic formula</li> <li>• What are the most used formulas in Excel</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"> <li>1. Practice to Insert formulas of Summation, subtraction, Multiply, division</li> <li>2. Practice to Insert formulas of average, max, min &amp; word count</li> </ol>	<p>06 Hrs</p> <p>Total- 08 Hrs</p>		
<p>LU3</p> <p>Format workbook</p>	<p><b>Trainee will be able to</b></p> <ul style="list-style-type: none"> <li>• Insert table row</li> <li>• Insert table column</li> <li>• Delete table row</li> <li>• Delete table column</li> <li>• Use conditional formatting</li> <li>• Use table style</li> <li>• Use cell style</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><b><u>Theory</u></b></p> <ul style="list-style-type: none"> <li>• How do you format in Excel</li> </ul>	<p>Theory- 01 Hrs</p> <p>Practical- 03 Hrs</p> <p>Total- 04 Hrs</p>	<p>Desktop computer/ Laptop</p>	<p>Computer Lab</p>



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		<ul style="list-style-type: none"> <li>How do you format and edit worksheet in MS Excel</li> </ul> <p><b>Practical Activity:</b></p> <ol style="list-style-type: none"> <li>Practice to insert table</li> <li>Practice to add columns &amp; rows</li> <li>Practice to change cell and table style</li> </ol>			
<p><b>LU4</b></p> <p>Create charts and Graphs</p>	<p><b>Trainee will be able to</b></p> <ul style="list-style-type: none"> <li>Identify charts components</li> <li>Create a column graph</li> <li>Create a line graph</li> <li>Create a bar graph</li> <li>Create a pie graph</li> </ul>	<p><b>Knowledge Based Questions</b></p> <p><u><b>Theory</b></u></p> <ul style="list-style-type: none"> <li>What is chart &amp; graph explain</li> <li>What are components of chart</li> <li>Describe different types of graph</li> </ul> <p><u><b>Practical Activity:</b></u></p> <ol style="list-style-type: none"> <li>Practice to make column graph</li> </ol>	<p>Theory- 01 Hrs</p> <p>Practical- 03 Hrs</p> <p>Total- 04 Hrs</p>	<p>Desktop computer/ Laptop</p>	<p>Computer Lab</p>



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		<ol style="list-style-type: none"><li>Practice to make line graph</li><li>Practice to make bar &amp; pie graph</li></ol>			
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**National Curriculum Level-3 in Agricultural Machinery Technology**



**Module 14. Prepare Presentation**

**Overview:** After this Module candidate will be able to prepare and manage the professional presentations.

**Duration: 12 Hours**

**Theory: 3 Hours**

**Practice: 9 Hours**

**Credit Hours: 1.2**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b> Prepare slides	<b>Trainee will be able to:</b> <ul style="list-style-type: none"><li>Identify the components of the PowerPoint slide</li><li>Use layout of slides (title only, title slide, title and contents, two contents, and blank)</li><li>Apply slide design</li><li>Add smart art</li></ul>	<b>Knowledge Based Questions</b>  <b>Theory</b> <ul style="list-style-type: none"><li>What is PowerPoint and how does it work</li></ul> <b>Practical Activity:</b> <ol style="list-style-type: none"><li>Make a new slide</li><li>Change style of slide</li><li>How to add text</li><li>How to add picture</li></ol>	Theory- 01 Hrs  Practical- 03 Hrs  Total- 04 Hrs	<ul style="list-style-type: none"><li>Desktop computer/</li><li>Laptop</li></ul>	Computer Lab
<b>LU2.</b> Select animation effects	<b>Trainee will be able to</b> <ul style="list-style-type: none"><li>Identify the various animation effects</li><li>Use animation pane</li><li>Use timing of an animation</li></ul>	<b>Knowledge Based Questions</b>  <b>Theory</b> <ul style="list-style-type: none"><li>Use of various animation effects</li></ul>	Theory- 01 Hrs  Practical- 03 Hrs	<ul style="list-style-type: none"><li>Desktop computer/</li><li>Laptop</li></ul>	Computer Lab





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		<ul style="list-style-type: none"> <li>How to use animation pane</li> <li>How to adjust timing of an animation</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"> <li>Insert animation effect</li> <li>Adjust timing for an animation</li> </ol>	Total- 04 Hrs		
<b>LU3</b>  Select Slide show	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Identify slide show option</li> <li>Start from beginning</li> <li>Start from the current slide</li> <li>Strat recorded slide show</li> </ul>	<b>Knowledge Based Questions</b>  <p><b><u>Theory</u></b></p> <ul style="list-style-type: none"> <li>What is slide show option</li> <li>How to start from beginning</li> <li>How to start from current slide</li> </ul> <p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"> <li>Make 10 slides and apply slide show option from beginning</li> </ol>	Theory- 01 Hrs  Practical- 03 Hrs  Total- 04 Hrs	<ul style="list-style-type: none"> <li>Desktop computer/</li> <li>Laptop</li> </ul>	Computer Lab



***National Curriculum Level-3 in Agricultural Machinery Technology***



		2. Make 15 slide and apply slide show from 6 slide			
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## National Curriculum Level-3 in Agricultural Machinery Technology



### Module: 15. Manage E-mail/Internet

**Overview:** After this Module candidate will be able to create and manage the e-mail account and learn how to use search engines to browse the data.

**Duration: 10 Hours**

**Theory: 4 Hours**

**Practice: 6 Hours**

**Credit Hours: 1**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b>  Manage E-mail account	<b>Trainee will be able to:</b> <ul style="list-style-type: none"> <li>Identify the e-mail service providers</li> <li>Identify components of e-mail</li> <li>Create e-mail account</li> <li>Compose e-mail</li> <li>Use inbox of the e-mail</li> <li>Use sent items of e-mail</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>What is internet</li> <li>What is email service provider</li> <li>What are the types of email service provider</li> <li>What are different components of e-mail</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>Find out different e-mail service provider</li> <li>Create e-mail account on yahoo</li> </ol>	Theory- 02 Hrs  Practical- 03 Hrs  Total- 05 Hrs	<ul style="list-style-type: none"> <li>Desktop computer/</li> <li>Laptop</li> </ul>	Computer Lab



# National Curriculum Level-3 in Agricultural Machinery Technology



		3. Create e-mail account on gmail 4. Compose a mail 5. Now sent a mail 6. Check inbox			
<b>LU2.</b>  Perform Browsing and Download data	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Identify various search engines (Google, yahoo, bing)</li> <li>Perform a search on different search engines</li> <li>Perform browsing of various objects</li> <li>Perform browsing of various videos</li> <li>Identify various downloaders (IDM and eagle get )</li> <li>Identify different file formats (MP3, MP4, PDF, JPG, Dox, RAR, and EXE)</li> <li>Saving a file with a proper path</li> </ul>	<b>Knowledge Based Questions</b>  <b>Theory</b> <ul style="list-style-type: none"> <li>What is search engine describe different types of search engine</li> <li>What is Internet browser and examples</li> <li>How to download data from internet</li> <li>Describe various types of downloader</li> <li>How to save with proper path</li> <li>Describe different file formats</li> </ul>	Theory- 02 Hrs  Practical- 03 Hrs  Total- 05 Hrs	<ul style="list-style-type: none"> <li>Desktop computer/</li> <li>Laptop</li> </ul>	Computer Lab



***National Curriculum Level-3 in Agricultural Machinery Technology***



		<p><b><u>Practical Activity:</u></b></p> <ol style="list-style-type: none"><li>1. Search advance computer on google engine</li><li>2. Browse video of wheat thresher</li><li>3. Download PDF file</li></ol> <ul style="list-style-type: none"><li>• Download MP3 file</li><li>• Download a video</li></ul>			
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## National Curriculum Level-3 in Agricultural Machinery Technology



### Module: 16. Maintain Machine Documents

**Overview:** After this Module candidate will be able to create and manage the e-mail account and learn how to use search engines to browse the data.

**Duration: 10 Hours**

**Theory: 4 Hours**

**Practice: 6 Hours**

**Credit Hours: 1**

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1.</b> Maintain Machine log book	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Insert identification details</li> <li>Mark the servicing periods of machine</li> <li>Enter the operation of machine</li> <li>Synchronize the machine operation with the prescribed fuel average</li> </ul>	<b>Knowledge Based Questions</b>  <u>Theory</u> <ul style="list-style-type: none"> <li>Describe various sections of a machine log book</li> </ul> <u>Practical Activity:</u> <ol style="list-style-type: none"> <li>Maintain machine log book</li> </ol>	Theory- 00 Hrs  Practical- 03 Hrs  Total- 03 Hrs	<ul style="list-style-type: none"> <li>Log book</li> </ul>	Store
<b>LU2.</b> Maintain Machine store ledger	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>Enlist the documentation regarding machine components</li> </ul>	<b>Knowledge Based Questions</b>	Theory- 00 Hrs  Practical-	<ul style="list-style-type: none"> <li>Ledger Register</li> </ul>	Store



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	<ul style="list-style-type: none"> <li>• Categorize the components for store</li> <li>• Insert the inward /outward movement of the components/Machines</li> </ul>	<p><b><u>Theory</u></b> How to maintain stock register?</p> <p><b><u>Practical Activity:</u></b> 1. Maintain machine store ledger</p>	<p>03 Hrs</p> <p>Total- 03 Hrs</p>		
<b>LU3.</b> Interpret and follow periodic maintenance chart	<p><b>Trainee will be able to</b></p> <ul style="list-style-type: none"> <li>• Interpret the periodic maintenance charts</li> <li>• Service according the given operational hours</li> <li>• Sort the used components for disposing off</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 importance of lubricating moving parts</li> </ul> <p><b><u>Practical Activity:</u></b> 1. Interpret the periodic maintenance charts</p>	<p>Theory- 02 Hrs</p> <p>Practical- 00 Hrs</p> <p>Total- 02 Hrs</p>	<ul style="list-style-type: none"> <li>• Periodic maintenance chart</li> </ul>	Workshop



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<b>LU4.</b> Interpret Operator and service manual	<b>Trainee will be able to</b> <ul style="list-style-type: none"> <li>• Interpret the signs and signals of instrument cluster</li> <li>• Interpret the control and functions of machine</li> <li>• Identify the lubrication points of machines</li> </ul>	<b>Knowledge Based Questions</b>  <u><b>Theory</b></u> <ul style="list-style-type: none"> <li>• Describe the operational hazards of any field machine</li> </ul> <u><b>Practical Activity:</b></u> <ol style="list-style-type: none"> <li>1. Interpret the signs and signals of instrument cluster</li> </ol>	Theory-  02 Hrs  Practical-  00 Hrs  Total-  02 Hrs	<ul style="list-style-type: none"> <li>• Operator manual</li> <li>• Service manual</li> </ul>	Workshop
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***National Curriculum Level-3 in Agricultural Machinery Technology***



**Curriculum Validation Members:**

	<b>Name</b>	<b>Designation</b>
1	Mr. Sikandar Masood	Director NAVTTC/ 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



**National Curriculum Level-3 in Agricultural Machinery Technology**



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
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-3 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 NAVTTC 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 NAVTTC/ Coordinator	
2	Mr. Aijaz Ahmad Zia	DACUM Facilitator	
3	Dr. Muhammad Naazir Khan Niazi	Chairman, PBTE Lahore	
4	Mr Muzamil Hussain	AM, RYK PTEVA	
5	Mr. Muhammad Afzal	Asstt Manager, Millat Tractors, Rawalpindi	
6	Engr. Shahzad Amir Rafiq	Instructor GCT, Sahiwal PTEVA	
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	
13	Mr. Atif Latif	AD, R&D, P-TEVTA	
14	Engr. M. Sohaib	Agriculture Engineer, AMTI, Talagang	
15	Engr. Tahreem Javed	SuperPark Engineering Lahore	