National Competency Standards Level-3 in Agricultural Machinery Technology

"Agricultural Machinery Operator"

National Vocational and Technical Training Commission (NAVTTC),
Government of Pakistan

ACKNOWLEDGEMENTS

National Vocational and Technical Training Commission (NAVTTC) 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.

NAVTTC 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. NAVTTC 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, NAVTTC 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. NAVTTC will ensure to keep the qualifications abreast with the changing demands of both national and international job markets.

Executive Director (NAVTTC)

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1. Introduction

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.

2. Purpose of the Qualification

The purpose of this qualification is to set the high professional standards for the agricultural machine 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 Mechatronics Technological sector
- Enabling / helping / facilitating the existing workforce to indulge themselves in new technologies and methods

3. Core competencies of the Qualification

Sr No	Competency Standards	NVQF 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
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
	Total			**120**	**480**	**600**	**60**
	Percentage			**20**	**80**		

4. Date of Validation

The level 5 of National DAE qualification for 'Agricultural Machine Mechanic' has been validated by the Qualifications Validation Committee (QVC) members on 16th Jan, 2031 and will remain valid for ten years i.e. 16th Jan, 2031

5. Date of Review

The level 5 of National DAE qualification for 'Agricultural Machine Mechanic' has been validated by the Qualifications Validation Committee (QVC) members on 16th Jan, 2031 and shall be reviewed after 3 years i.e. 17th Jan, 2024

6. Minutes of Meeting

Report Regarding Validation of Competency Standards for National Vocational Qualifications Level 5 for Agricultural Machinery Technology

MINUTES OF MEETING

A meeting of Qualification Review and Validation Committee for Review and Validation of Competency Standards for the trade of "Agricultural Machinery Technology" was held at Pakistan Industrial Technical Assistance Center, Lahore from 12th – 16th Jan, 2021. The following activities took place during meeting:

1. Introduction of OP & CS file to the new participants
2. Detailed discussion regarding validation process
3. Consultation was made with the relevant industry experts to confirm the accuracy of the competency standards
4. Levels of competency standards were defined according to NVQF Level Descriptor
5. Prepared the packaging of CS as per expert's guidelines.
6. Assigned the credit hours for CS as per PBTE and NVQF guidelines.
7. Revision of competency standards as per Industry/TEVTAs/BTEs requirements
8. Tools and equipment lists were revised as per industry requirements.
9. Time allocation for contact hours is confirmed with the industry & academia representatives and adjusted accordingly.
10. Competency standards were packaged in National Occupational Standards in 5 certifications of Levels 1, 2, 3, 4 and 5.

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

S#	Expert Name	Designation	Signature
1.	Rana Imran Sattar	Instructor, GCT, Railway Road Lahore	
2.	Mr. Atif Latif	Assistant Director (R&D), Auto Farm Expert (P-TEVTA)	
3.	Mr. Muhammad Afzal	Assistant Manager, Millat Tractors Ltd.	
4.	Engr. Shahzad Amir Rafiq	DPO Sahiwal and Pakpattan (P-TEVTA)	
5.	Engr. Jamal Akbar	Associate Prof (KP TEVTA)	
6.	Engr. Aqib Sharif	Manager Accreditation (P-TEVTA)	
7.	Syeda Fatima Iqbal	System Analyst (PBTE)	
8.	M. Shahzad Khalid	Instructor VTI Burewala (PVTC)	
9.	Mr. Nazakat Hussain Qureshi	Ex-Head, Farm Implements, Millat Tractors Ltd.	
10.	Engr. Liaquat Ali Jamroh	Director (Academics), Sindh TEVTA	
11.	Mr. Sikandar Masood	Director NAVTTC/ Coordinator	
12.	Engr. Aijaz Ahmed Zia	DACUM Facilitator	

7. Codes of Qualifications

The International Standard Classification of Education (ISCED) is a framework for assembling, compiling and analyzing cross-nationally comparable statistics on education and training. ISCED codes for these qualifications are assigned as follows:

ISCED Classification for level-5	
Code	**Description**
0716-MVS&A(1)	1st Level National Certificate of level-5, in " Agricutural Machinery Mechanic''
0716-MVS&A (2)	2nd Level National Certificate of level-5, in " Agricutural Machinery Mechanic''
0716-MVS&A (3)	3rd Level National Certificate of level-5, in " Agricutural Machinery Mechanic''
0716-MVS&A 4)	4th Level National Certificate of level-5, in " Agricutural Machinery Mechanic''
0716-MVS&A (5)	5th Level National Certificate of level-5, in " Agricutural Machinery Mechanic''

8. Members of Qualification Development Committee

The following members participated in the qualifications development and validation of this qualification:

S#	Name	Designation	Organization
1.	Dr. Dilbagh Muhammad	Ex. Director Farm Machinery	PCCC Mutan
2.	Dr. Ghaffar Dogar	Visiting Professor IAGS	Punjab University
3.	Dr. Muhammad Yasin	Assistant Professor	Punjab University
4.	Mr. Muhammad Afzal	Assistant Manager	Millat Tractor
5.	Engr. Atif Latif	Assistant Director (R&D)	P-Tevta
6.	Mr. Shahzad Rashid	Lecturer	GCT Faisalabad
7.	Mr. Shakeel Ahmed	Lecturer	GCT Faisalabad
8.	Mr. Rana Imran Sattar	Assistant Professor	GCT Railway Road
9.	Mr. Maroof Siddique	PhD Scholar	Punjab University
10.	Mr. Arsalan Abbas	Research Assistant	Punjab University
11.	Engr. Abdul Kabir	Research Assistant	The University of Lahore
12.	Engr. Aijaz Ahmed Zia	DACUM Facilitator	INTECH/UET Lahore
13.	Mr. Sikandar Masood	Director SS&C	NAVTTC HQs

9. Qualification Validation Committee

The following members participated in the qualifications development and validation of this qualification:

S#	Name	Designation	Organization
1.	Rana Imran Sattar	Instructor	GCT, Railway Road Lahore
2.	Mr. Atif Latif	Assistant Director	P- TEVTA
3.	Mr. Muhammad Afzal	Assistant Manager,	Millat Tractors Ltd.
4.	Engr. Shahzad Amir Rafiq	DPO Sahiwal and Pakpattan	P-TEVTA
5.	Engr. Jamal Akbar	Associate Prof	KP TEVTA
6.	Engr. Aqib Sharif	Manager Accreditation	P-TEVTA
7.	Syeda Fatima Iqbal	System Analyst	PBTE
8.	M. Shahzad Khalid	Instructor	VTI Burewala PVTC
9.	Mr. Nazakat Hussain Qureshi	Ex-Head, Farm Implements	Millat Tractors Ltd.
10.	Mr. Sikandar Masood	Director / Coordinator	NAVTTC
11.	Engr. Aijaz Ahmed Zia	DACUM Facilitator	INTECH/UET

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10. Entry Requirements

The entry requirements for National Certificate level 3, in Agricultural Machinery Technology are:

1. A person having middle education (8th class)
2. National Certificate level 2, in Agricultural Machinery Technology

11. Detail of Qualifications and its Competency Standards

0716-MVS&A-1. Perform Basic Manual Drawing

Overview. This competency standard 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.

Critical Evidence	Performance Criteria
CU1. Draw horizontal, vertical and inclined lines.	**P1.** Prepare the Drawing sheet. **P2.** Select the tools. **P3.** Draw the Boundaries lines as per standards. **P4.** Make the title bar. **P5.** Divide the sheets in two equal parts. **P6.** Draw lines at 30, 45, 60, 90and 120 angles.
CU2. Draw single stroke capital vertical lettering.	**P1.** Prepare the Drawing sheet. **P2.** Select the tools. **P3.** Use the dedicated pencil for lettering with the holding techniques. **P4.** Draw the Boundary lines as per standards. **P5.** Make the title bar **P6.** Draw the upper and lower lines for lettering according to the standards. **P7.** Start with writing Vertical Lettering with the different style such as Gothic, Roman and free hand lettering.
CU3. Draw single stroke capital inclined lettering.	**P1.** Prepare the Drawing sheet. **P2.** Select the tools. **P3.** Draw Boundaries lines as per standards. **P4.** Make title bar. **P5.** Draw the upper and lower lines for lettering according to the standards.

	P6. Start writing with inclined Lettering with various styles such as Gothic, Roman and free hand lettering.
CU4. Draw circles, half circles, radius with compass.	**P1.** Prepare Drawing sheet. **P2.** Select the tools. **P3.** Draw the Boundaries lines as per standards. **P4.** Make title bar. **P5.** Divide the sheets in various equal parts. **P6.** Make the circles and half circles with different diameters
CU5. Draw Lines	**P1.** Prepare Drawing sheet. **P2.** Select the tools. **P3.** Draw the Boundaries lines as per standards. **P4.** Make the title bar. **P5.** Divide the sheets in two or various equal parts. **P6.** Draw the Center lines. **P7.** Draw the parallel-lines. **P8.** Draw the perpendicular & bisector lines. **P9.** Draw the equal division of lines. **P10.** Make the various curves with different angles **P11.** Draw the crossing line.
CU6. Draw round corners, circles elements, quadrilaterals inside and outside circle.	**P1.** Prepare Drawing sheet. **P2.** Select the tools. **P3.** Draw Boundaries lines as per standards. **P4.** Make title bar **P5.** Divide the sheets in two or various equal parts. **P6.** Make different radius circles. **P7.** Make different types of diagrams that touch the circles at the tangent points
CU7. Construct angles and triangles	**P1.** Prepare Drawing sheet. **P2.** Select the tools. **P3.** Draw Boundaries lines as per standards. **P4.** Make title bar **P5.** Divide the sheets in different equal parts. **P6.** Draw Equilateral Triangle, Isosceles triangle, Scalene Triangle, Right angle Triangle, Obtuse Triangle, Acute Triangle.

Knowledge & Understanding

- Type of Drawings
- Importance of Technical Drawing.
- Identification and usage of common drawing instruments
- Common terminologies used in technical drawings.
- Application of Technical drawings
- Drawing Pencil, their grading, sharpening and using techniques.
- Style of letters.
- General rules for letterings
- Types of lines
- Common Types of lines and correct line weightage.
- Application of lines.
- Introduction to geometry.
- Introduction to sketching techniques.
- Techniques of sketching straight lines in different directions.
- Triangles, Quadrilateral, and Polygons definitions and types.

Critical Evidence

The candidate needs to produce the following **Critical Evidence**(s) in order to be competent in the following competency standards.

- Draw lines, triangles and circles.
- Draw single stroke capital letters.

Tool & Equipment

S. No.	Items
1.	Graph papers and drawing sheet.
2.	Sheet holders (tape / calipers)
3.	Drawing Board/Table.
4.	T-Square
5.	D / Protector
6.	Ruler

7.	Pencils and Erasers
8.	Set Square.
9.	Templates.
10.	Geometry (Instrument) Box.
11.	Compass and Dividers.

0716-MVS&A-2. Construct electrical circuits and test its parameters by using electrical measuring instruments

Overview. After this competency standard candidate will be able to interpret and construct basic electrical circuits.

Competency Unit	Performance Criteria
CU1. Prepare series circuit	P1.Draw the circuit on the board P2.Attach the bulb and holder according to drawing P3 Connect the wire with holder P4 Attach the circuit with battery
CU2. Prepare parallel circuit	P1.Draw the circuit on the board P2.Attach the bulb and holder according to drawing P3 Connect the wire with holder P4 Attach the circuit with battery
CU3. Measure the voltage & Resistance	P1. Select the multimeter and adjust the knob on voltage P2 Attach the probe with circuit and measure the voltage P3.Select the multimeter and adjust the knob on ohm P4 Attach the probe with circuit and measure the resistance
CU4. Identify Various Diodes	P1.Identify the Diodes P2.Identify its types & polarities
CU5. Identify Resistors in circuit	P1.Identify the Resistor & its types P2.Recognize Coding &Color coding of resistor P3.Design series & Parallel circuit of Resistor P4.Use formulae for Series & parallel circuit of resistors
CU6. Identify Various types of Sensors	P1. Identify temperature sensors. P2. Identify sound sensors. P3. Identify proximity sensors. P4. Identify pressure sensors. P5. Identify light sensors. P6. Identify position sensors. P7. Identify voltage sensors. P8. Identify current sensors. P9. Identify the vision sensors. P11. Identigy infrared (IR) sensors. P12. Identify power requirement for each sensor

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes.

- Explain Basic electric and electronics components
- Describe the basic electric operations
- Define various types of sensors used in agricultural machines

Tools and Equipment

The tools and equipment required for this competency standard are given below.

S. No.	Items
1.	Multimeter
2.	Wire
3.	Holder
4.	Bulb
5.	Plier
6.	Cutter
7.	Resistors
8.	Diodes
9.	Various sensors

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence**(s) in order to be competent in this competency standard.

- Construct a combined series and parallel circuit and connect it with battery

0716-MVS&A-3. Perform battery testing and charging operations

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

Competency Unit	Performance Criteria
CU1.Check electrolyte level and gravity	P1.Park the vehicle on accurate place P2.Remove the filler cap P3 Check the electrolyte level and top up if required P4 Check the specific gravity with hydrometer and correct as per the standard
CU2. Top up the battery	P1.Park the vehicle on accurate place P2.Remove the filler cap P3 Check the electrolyte level P4 Pour the electrolyte into the battery
CU3.Check the voltage	P1. Set the multimeter on voltage P2. Apply the multimeter probe on battery terminal P3.Record the voltage

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes.

- Understand operation of electric measuring devices
- Understand basic battery checkup function

Tools and Equipment

The tools and equipment required for this competency standard are given below.

S. No.	Items
1.	Battery
2.	Voltmeter
3.	Hydrometer

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence**(s) in order to be competent in this competency standard.

- Measure the Ampere of given circuit with Multimeter

0716-MVS&A-4. Perform Basic Lathe Machine Operations

Overview. This competency standard covers the skills and knowledge required to Perform cantering 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

Critical Evidence	Performance Criteria
CU1. Perform centering operations	P1. Select the facing tools according to the job requirement. P2. Mount and set the required work-holding devices, work piece and cutting tools. P3. Follow the correct specifications for the part or component to be produced. P4. Select the safe procedures and tools to accomplish the work. P5. Adjust the operating parameters (e.g. speed and feed) of machine tool for centering the job. P6. Ensure all safety mechanisms are in followed
CU2. Perform facing Operations	P1. Select the facing tools according to job requirement. P2. Mount and set the required work-holding devices, work piece and cutting tools. P3. Follow the correct specifications for the job / part or component to be produced. P4. Select safe procedures and tools to accomplish the work. P5. Adjust the operating parameters (e.g. speed and feed) of machine tool to achieve the work specification. P6. Ensure all safety mechanisms are followed.
CU3. Perform turning Operations	P1. Obtain and follow the work specifications, drawings or sketches to accomplish the work. P2. Set up and adjust the machine as per work specifications and procedures. P3. Ensure the components produced have the required quality and specified dimensional accuracy. P4. Shut down the machine and equipment

CU4. Perform drilling and boring operations	P1. Select the drilling or boring tools according to the drawings. P2. Mount and set the required work (holding devices, work piece and cutting tools) P3. Adjust the RPM of machine according to the cutting speed. P4. Perform the boring operation according to the drawing. P5. Check quality of the component produced at different intervals. P6. Observe the personal and workplace safety.
CU5. Perform step turning operations	P1. Mount and set the required work-holding devices, work piece and cutting tools. P2. Select and adjust the appropriate speeds and feeds of turning machine. P3. Produce a component which matches the work specifications using appropriate methods and techniques. P4. Check the quality of the component produced at various intervals. P5. Follow the safety precautions to ensure safe work and to avoid any injury.
CU6. Perform knurling Operations	P1. Select the knurling tool according to drawing. P2. Set the tool and work piece in the machine according to the procedure. P3. Adopt the methods and techniques in order to produce proper knurling on the work piece. P4. Select and adjust an appropriate speeds and feeds of the lathe machine. P5. Use the coolants during knurling to achieve a smooth impression on the work piece. P6. Observe the personal and workplace safety.
CU7. Taper turning by tail stock off-set method	P1. Loosen the tailstock clamp out. P2. Offset tailstock required amount. P3. Centre the cutting tool. P4. Setup the cutting tool for a parallel turning. P5. Check the taper for an accuracy using the taper ring gauge. P6. Finish and turn the taper according to the required size in order to fit
CU8. Taper turning by plain taper turning attachment	P1. Remove the binding screw that cross the slide to cross the feed screw and nut. P2. Tighten the lock screw and set the cutting tool in the center. P3. Set the workpiece in the lathe machine and mark the length of

	taper. P4. Use the binding screw in order to connect the sliding block and side of taper's attachment. P5. Select the depth of a feed cut by the compound rest and feed handle. P6. Take a light cut and recheck the taper fit. P7. Finish the turn and fit the taper to a gauge.
CU0714E&A Taper turning by telescopic taper turning attachment	P1. Clean and oil the guide bar. P2. Loose lock screws and offset end of guide bar, P3. Set the bar to required taper in degrees. P4. Tighten the lock screw and set cutting tool on center. P5. Set the workpiece in lathe and mark the length of a taper and tighten the connecting screw on a sliding block. P6. Move the carriage until the center of attachment is opposite to the length of taper. P7. Lock the anchor and bracket to the lathe bed. P8. Take a cut and select the depth of a cut. P9. Readjust the taper attachment, Take a light cut and recheck the taper fit. P10. Finish the turn and fit the taper to a gauge.
CU10. Perform Internal and External threading Operations	P1. Mount and set the required work-holding devices, work piece and cutting tools. P2. Select and adjust the appropriate speeds and feeds of the turning machine. P3. Produce a component which matches the work specifications using an appropriate methods and techniques. P4. Check the quality of a component produced at the various t intervals. P3.Use the Proper cutting tool with a required dimensions. P5. Follow the safety precautions in order to ensure safe working environment to avoid accidents and injuries.

Knowledge & Understanding

- Safety precautions involved in the work.
- Methods and techniques of the mounting and setting of a work-piece.

- Methods and techniques for the adjustment of operating parameters of the machines and tools. .
- Procedure for the adjustment of speed and feed.
- Calculation of the speed and feed.
- Use of the holding and cutting tools
- Reading, understanding and interpretation of the work's specifications, drawings and sketches.
- Method and technique of the setting up and adjusting the machine.
- Techniques to check the quality of component produced.
- Procedure of the shutting down of machine and equipment after closure of activities.
- Safety precautions and procedures need to be observed the during work.
- Types of the drilling or boring tools and their function.
- Procedure of mounting and setting up of work-holding devices, work pieces and cutting tools.
- Method and technique of the adjusting RPM of a lathe machine.
- Safe boring procedures.
- Techniques of checking quality of components.
- Calculation of RPM.
- Kinds of tapers.
- Types of taper turning methods.
- Calculation of tapers.
- Methods and techniques of adjusting speeds and feeds of turning machine.
- Types of knurling tools.
- Types of knurling.
- Procedure of setting tools and work piece in the machine.
- Methods of knurling.
- Procedure of adjusting speeds and feeds of a lathe machine. Importance of using a coolants during a knurling.
- Knowledge of a lathe operations
- Use of a dial indicator
- Types of a threading tool.
- Types of a threading.
- Procedure of setting tools and work piece in the machine.
- Methods of threading.

- Procedure of adjusting speeds and feeds of a lathe machine. Importance of using the coolants during the knurling.

Critical Evidence

The candidate needs to produce following **Critical Evidence**(s) in order to be competent in this competency standard.

- Make a knurl on shaft
- Drill and Bore the shaft
- Perform turning operations.

Tool & Equipment

S. No.	Items
1.	Lathe Machine
2.	Cutting Tools
3.	Measuring Tools
4.	Personal Protective Equipment (PPE's)
5.	Files
6.	Vernier Caliper
7.	Checking gauges
8.	Knurling Tools
9.	Threading Tools

0716-MVS&A-5. Maintain Cooling system

Overview. After this competency standard candidate will be able to Service the cooling system of Prime Mover

Competency Unit	Performance Criteria
CU1. Replace the Radiator	P1.Open the Drain plug P2.Remove the upper & lower house pipe P3. Remove the fan shroud P3.Open the radiator bolt P4. Remove the Radiator from Prime Mover P5.Install the radiator P6. Clamp the upper & lower house pipes
CU2. Replace the Water Pump	P1.Remove the drive belt by losing belt adjuster P2. Drain the Coolant from Radiator P3.Remove the housing pipe P4.Remove the nuts/bolts from water pump housing P5.remove the Water pump from housing P6. Clean the surface of cylinder block and water pump housing P7.Insert gasket in the housing P8.Install the Water pump in housing
CU3. Replace the Thermostate valve	P1.Open the Drain Plug P2.Remove the upper Hose pipe from thermostat housing P3.remove the housing of thermostat valve by opening bolt P4. Remove & inspect working the thermostat valve P5.Clean the housing surface with scraper P6.Insert new gasket in the housing P6. Install the thermostat valve P7.Install the thermostat housing and upper hose pipe
CU4. Replace the coolant	P1.Remove radiator cap P2.Remove the drain plug on idling speed of engine P3.Remove all the rusted coolant from cooling system P4.Install the drain plug of radiator P5.Top up the cooling system with coolant
CU5. Remove the	P1.Remove the connection of Temperature gauge P2.Replace the temperature gauge

temperature gauge	P3.Remove the rusting / dust from the switch P4.Connect the temperature gauge and ground it P5.Install the temperature gauge

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes.

- Types of cooling systems
- Coolant cycle
- Engine Efficiency w.r.t. cooling process and ambient temperature
- Working principle of various components of cooling system

Tools and Equipment

The tools and equipment required for this competency standard are given below.

S. No.	Items
1.	Combination plier
2.	Nose plier
3.	Flat screw driver
4.	Philip screw driver
5.	Combination plier
6.	Parts tray
7.	Silicon
8.	Water pump & Thermostat valve Gaskits
9.	Socket set
10.	Scraper
11.	Nose plier

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence**(s) in order to be competent in this competency standard.

- Replace the thermostat valve

0716-MVS&A-6. Maintain Intake & Exhaust System

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

Competency Unit	Performance Criteria
CU1. Service the Air cleaner	P1.Remove the pre- air cleaner P2.Clean the pre- air cleaner P3. Install Pre-air cleaner P4.Remove the clamps of hose pipe and air cleaner P5.Wash the air cleaner with kerosene oil P6. Wash the air cleaner with water P7.Install the air cleaner P8.Top up the cleaner with oil
CU2. Maintain turbo charger	P1.Remove the exhaust elbow from Turbo charger P2.Remove the hose pipe from Turbo charger P3.Remove the Lubrication pipes from Turbo charger P4.Remove turbo charger from exhaust manifold P5. Remove the clamp of Compressor body of turbocharger P6.Dismantle the core assembly P7.Clean the Core assembly P8.Assemble the turbo charger P9.Install the turbo charger
CU3. Service the inlet-manifold	P1.Remove the hosepipe P2.Remove the electric connections of Thermo-starter P3.Remove the fuel pipes of Thermo-starter P4.Remove the fuel line from inlet manifold P5.Clean the surface with scraper P6.Place the joint-kit P7. Install the inlet manifold

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Define function of Turbocharger
- Explain troubleshooting and its remedy in Turbocharger
- Define working of Air Cleaner
- Describe the volumetric efficiency of engine

Tools and Equipment

The tools and equipment required for this competency standard are given below.

S. No.	Items
1.	Screw driver
2.	Spanner set
3.	Heavy duty Circlip plier
4.	Wire brush
5.	Scriber
6.	Scraper
7.	Mallet

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence**(s) in order to be competent in this competency standard.

- Service the turbo charger

0716-MVS&A-7. Operate Tractor

Overview. After this competency standard candidate will be able to Operate tractor in different field conditions

Competency Unit	Performance Criteria
CU1. Interpret the Highway code	P1.Interpret the cautionary road signs P2. Interpret the informatory road signs P3. Interpret the compulsory road signs P4.Enlist the safety measures of tractor Operation P5.Interprate the Road lanes P6.Enlist safety measures regarding different weather conditions P7. Enlist safety measures regarding different road conditions
CU2. Troubleshoot the tractor starting	P1.Perform the cockpit drill P2. Inspect the Electric connections and repair if needed P2.Remove the Fuel Air locking P3.inspect the Pre Heating system and replace glow plug if needed P4.Select the proper RPM for specific operation
CU3. Hitch the implement	P1.Allign the tractor (3-point linkage) with Implement P2.Conect the linkages with given implement P3.Conect the PTO shaft
CU4. Operate the Tractor	P1.Draw the cultivation field plan for MB plough on given field P2. Operate Disc plough P3.Operate Rotavator P4.Operate the Boom Sprayer P5. Drive on road tractor with trolly P6. Operate tractor with front / rear blade

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes.

- Primary and secondary tillage implements
- Planting and plant protection implements

Tools and Equipment

The tools and equipment required for this competency standard are given below.

S. No.	Items
1.	Tractor
2.	Disk plough
3.	Rotavator
4.	Boom Sprayer
5.	MB plough
6.	Wire striper
7.	Insulation tape

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence**(s) in order to be competent in this competency standard.

- Hitch the boom sprayer
- Operate the MB plough in field

0716-MVS&A-8. Operate land preparation implements

Overview: After this competency standard candidate will be able to operate farm equipments which are used in agriculture.

Competency Unit	Performance Criteria
CU1. Identify land preparation implements	**P1.** Identify plain-bed implements (cultivators, planker) **P2.** Identify bed-furrow implements (bed-shaper, bed-furrow maker) **P3.** Identify ridge-furrow implements (ridger)
CU2. Plan field operations	**P1.** Draw sketch of the field **P2.** Assess the field conditions **P3.** Prepare work plan for operation **P4.** Estimate the required inputs
CU3. Use land preparation implements	**P1.** Inspect implements **P2.** Use of plain-bed implements **P3.** Use of bed-furrow implements **P4.** Use of ridge-furrow implements

Knowledge & Understanding

The candidate must be able to demonstrate the underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Enlist the land use preparation implements
- Describe the bed preparation procedure
- Explain the working of tillage implements

Tools and Equipment

The tools and equipment required for this competency standard are given below:

S. No.	Items
1.	Cultivators
2.	Planker
3.	Bed-shaper
4.	Bed-furrow maker
5.	Ridger

Critical Evidence(s) Required

The candidate needs to produce the following **Critical Evidence**(s) to be competent in this competency standard:

- Operate cultivator
- Describe MB plough
- Importance of seed drill

0716-MVS&A-9. Operate sowing and planting implements

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

Competency Unit	Performance Criteria
CU1. Operate sugarcane planter	**P1.** Identify planter parts (main frame, gear box, PTO shaft, dual movement cutter frame, stationary cutter frame, hopper, ridger, stems tube) **P2.** Attach implement with 3-point linkage system of tractor. **P3.** Load the sugarcane stems in hoper. **P4.** Run the tractor.
CU2. Operate potato planter	**P1.** Identify different parts of potato planter (main frame, hopper, potato bucket conveyor, ridger, fluted wheels, potato tube) **P2.** Attach implement with 3-point linkage system of 50Hp tractor. **P3.** Load dried pieces of potatoes into the potato seed hopper and fertilizer into fertilizer container. **P4.** Run the tractor.
CU3. Operate wheat drill	**P1.** Identify different parts of wheat seed drill (Frame, Seed metering device; Furrow opener; Covering device; Rotating wheel; Seed tubes; Clutch). **P2.** Replace any broken or worn out parts. **P3.** Attach implement with 3-point linkage system of 50Hp tractor. **P4.** Add the seed to the seed box **P5.** Calibrate the seed drill. **P6.** Adjust seed rate and planting depth.
CU4. Operate post hole Digger	**P1.** Select appropriate auger size **P2.** Align the three point linkages with post hole digger **P3.** Attach post hole digger with tractor **P4.** Maintain suitable PTO RPM **P5.** Dig hole using post hole digger **P6.** Lubricate the drive shaft and gear box

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- List down various parts of sugarcane planter.
- Describe the calibration procedure of wheat seed drill.

Tools and Equipment

The tools and equipment required for this competency standard are given below:

Items
Sugarcane planter
Wheat seed drill
Potato planter

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence**(s) in order to be competent in this competency standard:

- Adjustment of desired depth of wheat seed drill Seed

0716-MVS&A-10. Operate Wheat Straw Chopper

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

Competency Unit	Performance Criteria
CU1. Identify Wheat straw chopper	**P1.** Identify different types of farm choppers **P2.** Identify wheat straw chopper components (Cutter bar, auger, conveyer belts, blower, tractor, PTO shaft, cross shaft, trolley, threshing unit with blades) **P3.** Observe the field before operating wheat straw chopper
CU2. Operate Wheat straw chopper	**P1.** Attach wheat straw chopper with tractor PTO **P2.** Set the tractor PTO to deliver 540rpm. **P3.** Perform idle running of Wheat straw chopper **P4.** Perform cutting operation of crop residue **P5.** Ensure chopping of straw **P6.** Ensure chopped material transferred to trolley **P7.** Unload the trolley from chopped the material **P8.** Ensure crop stalk in corners is also collected
CU3. Maintain Wheat straw chopper	**P1.** Inspect wheat straw chopper cutter bar **P2.** Inspect tension of conveyer belts, **P3.** Inspect tractor PTO shaft and cross shaft **P4.** Inspect threshing drum blades **P5.** Inspect greasing of PTO shaft, wheels hub and tandem shaft **P6.** Replace cuter bar blades on wear and tear **P7.** Replace threshing drum tips/ blades on wear and tear **P8.** Replace blower (If required)

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Enlist different components of wheat straw chopper.
- Explain the procedure of wheat straw chopper.

Tools and Equipment

The tools and equipment required for this competency standard are given below:

S. No.	Items
1.	Cutter Bar
2.	Crop row divider
3.	Conveyer belt
4.	Wheels
5.	Auger
6.	Blower
7.	Threshing unit with blades
8.	PTO shaft

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence**(s) in order to be competent in this competency standard:

- Attach wheat straw chopper with tractor PTO
- Replace cuter bar blades

0716-MVS&A-11. Use Computer System

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

Competency Unit	Performance Criteria
CU1. Identify basic parts of a computer	**P1.** Identify the input devices **P2.** Identify the output devices **P3.** Identify Mass storage devices **P4.** Identify the basic operating systems
CU2. Use peripheral devices of computer	**P1.** Use input devices **P2.** Use output devices **P3.** Use Mass storage devices
CU3. Install windows and software	**P1.** Perform window installation **P2.** Perform MS office installation **P3.** Install software applications **P4.** Perform antivirus installation **P5.** Format mass storage devices **P6.** Troubleshoot basic software errors

Knowledge & Understanding

The candidate must be able to demonstrate the underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Enlist the components devices of the computer
- Describe the output devices
- Explain window installation
- Describe MS office

Tools and Equipment

The tools and equipment required for this competency standard are given below:

S. No.	Items
1.	CPU
2.	Monitor
3.	Mouse
4.	Keyboard
5.	Monitor
6.	LCD
7.	Printer
8.	Speakers
9.	USB
10.	External hard drive
11.	DVD Rom

Critical Evidence(s) Required

The candidate needs to produce the following **Critical Evidence**(s) to be competent in this competency standard:

- Install windows
- Scan computer
- Troubleshoot softwares

0716-MVS&A-12. Prepare word document

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

Competency Unit	Performance Criteria
CU1. Setup a page in word	**P1.** Identify the components of page layout **P2.** Use margins **P3.** Use orientation **P4.** Use size of page **P5.** Use colums **P6.** Use page break **P7.** Use line numbers
CU2. Edit word document	**P1.** Identify the components to edit word document **P2.** Use save document **P3.** Use cut text in document **P4.** Use copy text in document **P5.** Use paste text in document **P6.** Use format painter
CU3. Format word document	**P1.** Identify components for format word document **P2.** Use font style **P3.** Use font size **P4.** Use font alignment **P5.** Use line spacing **P6.** Use bold text **P7.** Use italic text **P8.** Use underline text
CU4. Use of Insert in the word file	**P1.** Identify the components of the insert in a word document **P2.** Add cover page **P3.** Insert a picture in a word file **P4.** Make a table in a word file **P5.** Add clip art in document **P6.** Insert shapes **P7.** Insert SmartArt

	P8. Make chart **P9.** Use header **P10.** Use footer **P11.** Use page number

Knowledge & Understanding

The candidate must be able to demonstrate the underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Enlist the components to prepare a word document
- Describe edit word document
- Explain the importance of the format of a word document
- Describe the use of insert in a word document

Tools and Equipment

The tools and equipment required for this competency standard are given below:

S. No.	Items
1.	CPU
2.	Monitor
3.	Mouse
4.	Keyboard
5.	Monitor
6.	LCD

Critical Evidence(s) Required

The candidate needs to produce the following **Critical Evidence**(s) to be competent in this competency standard:

- Prepare tables in a word document
- Edit the word document

0716-MVS&A-13. Prepare spreadsheets

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

Competency Unit	Performance Criteria
CU1. Identify Main parts of a spreadsheet	**P1.** Identify cell in a workbook **P2.** Identify ribbon **P3.** Identify row heading **P4.** Identify column heading **P5.** Identify the formula bar **P6.** Identify worksheet **P7.** Identify work area identify view buttons
CU2. Use basic formula	**P1.** Use summation formula **P2.** Use subtraction formula **P3.** Use multiply formula **P4.** Use division formula **P5.** Use the average formula **P6.** Use Maximum formula **P7.** Use minimum formula **P8.** Use word count formula
CU3. Format workbook	**P1.** Insert table row **P2.** Insert table column **P3.** Delete table row **P4.** Delete table column **P5.** Use conditional formatting **P6.** Use table style **P7.** Use cell style
CU4. Create charts and Graphs	**P1.** Identify charts components **P2.** Create a column graph **P3.** Create a line graph **P4.** Create a bar graph **P5.** Create a pie graph

Knowledge & Understanding

The candidate must be able to demonstrate the underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Enlist the components spreadsheet
- Describe chart types
- Explain the importance of formulas

Tools and Equipment

The tools and equipment required for this competency standard are given below:

S. No.	Items
1.	CPU
2.	Monitor
3.	Mouse
4.	Keyboard
5.	Monitor

Critical Evidence(s) Required

The candidate needs to produce the following **Critical Evidence**(s) to be competent in this competency standard:

- Format the spreadsheet
- Create a bar graph
- Create and format the table

0716-MVS&A-14. Prepare presentation

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

Competency Unit	Performance Criteria
CU1. Prepare slides	**P1.** Identify the components of the PowerPoint slide **P2.** Use layout of slides (title only, title slide, title and contents, two contents, and blank) **P3.** Apply slide design **P4.** Add smart art
CU2. Select animation effects	**P1.** Identify the various animation effects **P2.** Use animation pane **P3.** Use timing of an animation
CU3. Select Slide show	**P1.** Identify slide show option **P2.** Start from beginning **P3.** Start from the current slide **P4.** Strat recorded slide show

Knowledge & Understanding

The candidate must be able to demonstrate the underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Enlist the components PowerPoint
- Describe the animations of slide
- Explain the design of slides

Tools and Equipment

The tools and equipment required for this competency standard are given below:

S. No.	Items
1.	CPU

2.	Monitor
3.	Mouse
4.	Keyboard

Critical Evidence(s) Required

The candidate needs to produce the following **Critical Evidence**(s) to be competent in this competency standard:

- Prepare presentation
- Apply the animations on slides

0716-MVS&A-15. Manage E-mail/Internet

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

Competency Unit	Performance Criteria
CU1. Manage E-mail account	**P1.** Identify the e-mail service providers **P2.** Identify components of e-mail **P3.** Creat e-mail account **P4.** Compose e-mail **P5.** Use inbox of the e-mail **P6.** Use sent items of e-mail
CU2. Perform Browsing	**P1.** Identify various search engines (Google, yahoo, bing) **P2.** Perform a search on different search engines **P3.** Perform browsing of various objects **P4.** Perform browsing of various videos
CU3. Download data	**P1.** Identify various downloaders (IDM and eagle get) **P2.** Identify different file formats (MP3, MP4, PDF, JPG, Dox, RAR, and EXE) **P3.** Saving a file with a proper path

Knowledge & Understanding

The candidate must be able to demonstrate the underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Enlist the components of search engines
- Describe search engines
- Explain e-mail accounts

Tools and Equipment

The tools and equipment required for this competency standard are given below:

S. No.	Items

1.	CPU
2.	Monitor
3.	Mouse
4.	Keyboard

Critical Evidence(s) Required

The candidate needs to produce the following **Critical Evidence**(s) to be competent in this competency standard:

- Compose e-mail
- Search various objects on google

0716-MVS&A-16. Maintain machine documents

Overview. After this competency standard candidate will be able to maintain complete service/ maintenance and operational record of Machines

Competency Unit	Performance Criteria
CU1. Maintain Machine log book	P1.Insert identification details P2.Mark the servicing periods of machine P3.Enter the operation of machine P4. Synchronize the machine operation with the prescribed fuel average
CU2. Maintain Machine store ledger	P1.Enlist the documentation regarding machine components P2.Catogerize the components for store P3.Insert the inward /outward movement of the components/Machines
CU3. Interpret and follow periodic maintainance chart	P1.Interpret the periodic maintenance charts P2.Service according the given operational hours P3.Sort the used components for disposing off
CU4. Interpret Operator and service manual	P1.Interpret the signs and signals of instrument cluster P2.Interpret the control and functions of machine P3.Identify the lubrication points of machines

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes.

- Read and interpret the repair manuals of machines
- Read and interpret serial number/part number of machine/components
- Identify lubricating points of machines
- Servicing of Machines

Tools and Equipment

The tools and equipment required for this competency standard are given below.

S. No.	Items
1.	Log books

2.	Operator Manuals
3.	Parts Manuals
4.	Service Manuals

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence**(s) in order to be competent in this competency standard.

- Interpret periodic maintenance chart of Machine
- Prepare Machine Log Book

A. Generic Competencies

17. Digital Skills

0716-MVS&A-17. Operate digital media technology

Overview: This unit describes the performance outcomes, skills and knowledge required to identify, select and use a digital media package and supporting technologies.

Unit of Competency	Performance Criteria
CU1. Use appropriate OHS office work practices	**P1.** Use safe work practices **P2.** Use wrist rests and document holders where appropriate **P3.** Use monitor anti-glare and radiation reduction screens where appropriate
CU2. Identify and select appropriate digital media package	**P1.** Identify the basic requirements of a design brief, including user environment **P2.** Research and review suitable available digital media packages **P3.** Select an appropriate digital media package to meet design brief requirements
CU3. Use digital media package	**P1.** Procure or create suitable data to meet requirements of the brief **P2.** Manipulate data using digital media package tools **P3.** Ensure naming and storing of documents in appropriate file format in directories or folders
CU4. Review digital media design	**P1.** Evaluate design for creative, dramatic and technical quality, file size, and suitability to meet the brief **P2.** Test and run any incorporated graphics, video or sound as part of a digital media presentation and present designs in the appropriate format **P3.** Review final product against the design

Knowledge & Understanding

K1: Basic principles of visual design

K2: Functions and features of digital media packages and technologies

K3: Graphic design and stylistic language conventions

K4: OHS principles and responsibilities for ergonomics, such as work periods and breaks

K5: Principles of digital imaging and file formats, video and sound file formats, file management and transfer systems

K6: Vendor product directions in digital media hardware and software

K7: Visualization and interpreting creative information, scripts (text) and images

Critical Evidence(s) Required

A person who demonstrates competency in this unit must be able to provide evidence of the ability to identify, select and use a digital media package and supporting technologies. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.

Performance requirements

This competency is to be assessed using standard and authorised work practices, safety requirements and environmental constraints. Demonstrated evidence of the ability to:

- Identify basic requirements of a design brief
- Use digital media package to meet organizational requirements
- Use OHS principles and responsibilities for ergonomics, such as work periods and breaks
- Use help manuals and online help when appropriate
- Use digital media technologies to support design brief requirements.

0716-MVS&A-18. Perform computer operations

Overview: This unit covers the knowledge, skills and attitudes and values needed to perform computer operations which include inputting, accessing, producing and transferring data using the appropriate hardware and software.

Unit of Competency	Performance Criteria
CU1. Plan and prepare for task to be undertaken	**P1.** Requirements of task are determined as per standard Start with action word !!! **P2.** operating the procedures **P3.** Appropriate hardware and software is selected according to task assigned and required outcome **P4.** Task is planned to ensure
CU2. Input data into computer	**P5.** Data are entered into the computer using appropriate Start with action word !!! **P1.** program/application in accordance with company procedures **P2.** Accuracy of information is checked and information is saved in accordance with standard operating procedures **P3.** Inputted data are stored in storage media according to requirements **P4.** Work is performed within ergonomic guidelines
CU3. Access information using computer	**P1.** Correct program/application is selected based on job requirements **P2.** Program/application containing the information required is accessed according to company procedures **P3.** Desktop icons are correctly selected, opened and **P4.** closed for navigation purposes **P5.** Keyboard techniques are carried out in line with OH & S requirements for safe use of keyboards
CU4. Produce/output data using computer system	**P1.** Entered data are processed using appropriate software commands **P2.** Data are printed out as required using computer hardware/peripheral devices in accordance with standard operating procedures **P3.** Files and data are transferred between compatible **P4.** systems using computer software, hardware/ eripheral **P5.** devices in accordance with standard operating

CU5. Maintain computer equipment and systems	**P1.** Systems for cleaning, minor maintenance and replacement of consumables are implemented correct as above **P2.** Procedures for ensuring security of data, including regular back-ups and virus checks are implemented in accordance with standard operating procedures **P3.** Basic file maintenance procedures are implemented in line with the standard operating procedures

Knowledge & Understanding

K1: Basic ergonomics of keyboard and computer use

K2: Main types of computers and basic features of different operating systems

K3: Main parts of a computer

K4: Storage devices and basic categories of memory

K5: Relevant types of software

K6: General security

K7: Viruses

K8: OH & S principles and responsibilities

K9: Calculating computer capacity

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence**(s) to be competent in this competency standard:

Performance requirements

This competency is to be assessed using standard and authorized work practices, safety requirements and environmental constraints. Demonstrated evidence is required of the ability to:

- Selected and used hardware components correctly and according to the task requirement
- Identified and explain the functions of both hardware and software used, their general features and capabilities
- Produced accurate and complete data in accordance with the requirements
- Used appropriate devices and procedures to transfer files/data accurately
- Maintained computer system

0716-MVS&A-19. Create technical documentation

Overview: This unit describes the performance outcomes, skills and knowledge required to create technical documentation that is clear to the target audience and easy to navigate.

Unit of Competency	Performance Criteria
1. Identify and analyze documentation requirements and client needs	1.1 Consult with client to identify documentation requirements 1.2 Interpret and evaluate documentation requirements and confirm details with client 1.3 Investigate industry and documentation standards for requirements 1.4 Define and document the scope of work to be produced 1.5 Consult with client to validate and confirm the scope of work
2. Design documentation	2.1 Identify information requirements with reference to layout and document structure 2.2 Create document templates and style guides consistent with information requirements 2.3 Conduct a review of the system in order to understand its functionality 2.4 Extract content that meets information requirements according to copyright restrictions 2.5 Develop the structure of the technical documentation giving focus to the flow of information, style, tone and content format 2.6 Validate the technical documentation structure with the client
3. Develop documentation	3.1 Write technical documentation based on the template and scope of work using the information gathered 3.2 Translate technical terminology into simple / plain English where appropriate 3.3 Apply content format and style according to documentation standards and templates
4. Evaluate and edit documentation	4.1 Submit technical documentation to appropriate person for review 4.2 Gather and analyze feedback 4.3 Incorporate alterations into the technical documentation 4.4 Edit the technical documentation for technical and grammatical errors.
5. Prepare	5.1 Check that the completed technical documentation meets client

documentation for publication	requirements and scope of work 5.2 Submit the technical documentation to appropriate person for approval correct as previous 5.3 Prepare the technical documentation for publication and distribution using appropriate channels

Knowledge & Understanding

K1: Content features, such as clarity and readability

K2: Document design, web design and usability

K3: Functions and features of templates and style guides

K4: Instructional design principles

K5: Organizational policies, procedures and standards that cover document design.

Critical Evidence(s) Required

A person who demonstrates competency in this unit must be able to provide evidence of the ability to create technical documentation that is clear to the target audience and easy to navigate. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.

Performance requirements

This competency is to be assessed using standard and authorized work practices, safety requirements and environmental constraints. Demonstrated evidence is required of the ability to:

- Establish customer needs
- Design and develop technical documentation, such as system, procedures, training material and user guides, incorporating appropriate standards
- Update document with client feedback
- Prepare documentation for publication.

0716-MVS&A-20. Create basic databases

Overview: This unit describes the skills and knowledge required to design, develop and test a database in order to meet a specification. It applies to individuals who may be either database, or web designers, required to create a simple database to store information for an online application, using a simple entity relational database.

Unit of Competency	Performance Criteria
1. Analyze the requirements for the database	1.1 Determine the information that the database is required to hold 1.2 Develop a written requirement report for the functionality of the database 1.3 Complete the documentation, and submit it to an appropriate person in order to be approved
2. Use data modeling to design the database to suit requirements	2.1 Design an entity-relationship (ER) diagram to model the relationships between the entities and the attributes that the database will hold 2.2 Develop primary and foreign keys to link the entities 2.3 Develop a data dictionary 2.4 Complete the documentation, and submit it to the appropriate person for approval correct as above
3. Create a database on a web or database server	3.1 Use the appropriate language on a web or database server to create few databases 3.2 Use the appropriate language on a web or database server to create few tables 3.3 Populate the database fields
4. Test the database and debug	4.1 Test the database on the web or a database server 4.2 Ensure that the information represented matches the requirements

Knowledge & Understanding

K1: outline the principles of open platforms, including browsers and databases

K2: list the processes associated with the creation of entities, attributes, and I populating fields, using both software solutions and script- based input

K3: describe data-modeling techniques to design a database

K4: outline the steps in database design, modeling and implementation

K5: describe the internet operation related to web servers and clients

K6: identify the naming conventions appropriate to database design

K7: identify security restrictions on servers, incorporating some theoretical concepts

K8: describe best practice communication, and accessibility, for audiences with special needs.

Critical Evidence(s) Required

A person who demonstrates competency in this unit must be able to provide evidence of the ability to create technical documentation that is clear to the target audience and easy to navigate. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.

Performance requirements

This competency is to be assessed using standard and authorized work practices, safety requirements and environmental constraints. Demonstrated evidence is required of the ability to:

- research client requirements for a database solution
- design a database that meets client requirements
- create a database on a web hosting service or server to meet client requirements by a due date
- Test and debug the database.

0716-MVS&A-21. Use social media tools for collaboration and engagement

Overview: This unit describes the performance outcomes, skills and knowledge required to establish a social networking presence using social media tools and applications. The unit specifically identifies the requirement to review, compare and use different types of social networking tools and applications.

Unit of Competency	Performance Criteria
1. Describe different types of social media tools and applications	1.1 Explain characteristics of the term social media 1.2 Identify different types of social-media tools and applications 1.3 Illustrate various issues associated with the use of social media tools and applications
2. Compare different types of social media tools and applications	2.1 Select one social media type for review 2.2 Review most popular tools and applications within that social media 2.3 Itemize benefits across a range of the most popular tools and applications 2.4 Select most appropriate social media tool or application
3. Set up and use popular social media tools and applications	3.1 Identify social media tools and applications for possible implementation 3.2 Initiate preferred social media tools and applications 3.3 Establish social media interface using text and file content 3.4 Initiate social network interaction 3.5 Test and evaluate tools and applications for ease of use 3.6 Report and elaborate the findings

Knowledge & Understanding

K1: Basic technical terminology in relation to social networking and social media applications and tools

K2: Basic knowledge of uploading images, text files, pdf files, audio files, video files and link associated files

K3: Features and functions of social media applications

K4: Import and export software functions

K5: Linking documents

K6: OHS principles and responsibilities for ergonomics, including work periods and breaks

K7: Tagging to facilitate collaborative folksonomy

K8: Social media applications and procedures for connecting to social networking sites

K9: Use of input and output devices

K10: Use of RSS feeds to connect a social network.

Critical Evidence(s) Required

A person who demonstrates competency in this unit must be able to provide evidence of the ability to create technical documentation that is clear to the target audience and easy to navigate. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.

Performance requirements

This competency is to be assessed using standard and authorized work practices, safety requirements and environmental constraints. Demonstrated evidence is required of the ability to:

- Establish customer needs
- Design and develop technical documentation, such as system, procedures, training material and user guides, incorporating appropriate standards
- Update document with client feedback
- Prepare documentation for publication.