

National Competency Standard level 5 for CAD CAM



National Vocational & Technical Training Commission(NAVTTTC)

ACKNOWLEDGEMENTS

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NAVTTTC team under the leadership of Dr. Muqem ul Islam initiated development of CBT & A based qualifications of diploma level-5 as a reform project of TVET sector in November 2018 and completed 27 NVQF diplomas of Level-5 in September, 2019. It seems worth highlighting that during this endeavor apart from developing competency standards/curricula in conventional trades new dimensions containing high-tech trades in TVET sector in the context of generation IR 4.0 trades have also been developed which inter alia includes Robotics, Mechatronics, artificial intelligence, industrial automation, instrumentation and process control. Moreover, trades like entrepreneurship, green/environmental skills and variety of soft/digital skill have also been developed to equip the Pakistani youth with skills set as per requirement of the global trends. These skills have been made integral part of all the 27 diplomas.

Nobody has been more important in the pursuit of this project than Dr. Nasir Khan, Executive Director, NAVTTTC, whose patronage and support remain there throughout the development process and lastly to thanks specially to Syed Javed Hassan, Chairman NAVTTTC and Raja Saad Khan, Deputy Team Lead TSSP-GIZ who made it happened in this challenging time.

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1. Introduction

CAD/CAM is the most popular software with the highest overall job-market demand. CAD designing is very important and very helpful for an individual and employer in all over the globe. More over individual can also get CAD certification which is an industry recognized credential that can help an individual to succeed in his/her design career—providing benefits to both individual and employer. Certification provides reliable validation of skills and knowledge and can lead to accelerated professional development, improved productivity, and enhanced credibility.

In connection of Market job demand to meet the demand of industry there is a need to strength and promote productive working relationship between the training provider and the industry in order to enhance quality of training delivery, enterprise competitiveness and access to decent employment.

That's why existing NVQF for AutoCAD trade have been identified for review and the further development of the missing levels, skills sets and industry demanded occupational competencies. Further this occupation have been developed in response to the demands of labor market and national priorities with the involvement of industry at key stages in the development process.

The main elements in the development of this qualification include; competency standards, structure, level, time allocation in credit hours , Tools and equipment's as per National Vocational Qualification Framework (NVQF) Development Manual 1 using the competency based training and assessment (CBT&A) approach.

2. Purpose of the Qualification

NVQF qualifications are comprehensible packages of competency standards related to defined occupations. They are developed in response to the demands of labor market and national priorities with the involvement of industry at key stages in the development process.

The purpose of these qualifications is to standardized competency standard for level-5 across the globe fort VET practitioners who will serve as key elements in enhancing quality of training and assessment. Also, to set and identify duties and tasks for the usual purpose of earning a living.

The specific objectives of developing these qualifications are as under:

- To set a high profile standard profession for the industry to generate standard outputs.
- To validate an individual skill, knowledge and understanding regarding relevant occupations.
- In a Competency-Based Training (CBT), these qualifications provide overall course guidelines in relation to teaching and learning and act as the key instrument in supporting standardized formal, non-formal and informal training.
- Improve the professional competence of TVET practitioners/instructional to fulfilled Job market demand.
- Capacitate the instructional staff in modern CBT&A tools, methodologies and processes as envisaged under NVQF.
- Provide flexible pathways and progressions in training and assessment field.

- Enable the TVET practitioners/instructional staff to perform their duties in efficient manner.
- Establish a standardized and sustainable system of training for TVET practitioners/instructional staff in the country.

3. Levelling of the Qualification

Level	Name of Occupation /Nomenclature	Generic competencies required	Core /Technical Competencies required
1	CAD/CAM Technology	<ul style="list-style-type: none"> • Operate digital media technology 	N/A
2		<ul style="list-style-type: none"> • Perform Computer Operation • Install Office Application suit • Format Document in MS Word • Operate spreadsheet applications • Create Presentation in MS Power Point • Work safely in an office environment 	<ul style="list-style-type: none"> • Perform Basic Manual Drawing • Construct different engineering curves • Construct multi-view drawings • Manage basic operations in AutoCAD
3		<ul style="list-style-type: none"> • Use social media tools for collaboration and engagement • Create Basic Databases 	<ul style="list-style-type: none"> • Manipulate images (Photoshop) • Develop 2-D drawing in AutoCAD • Develop basic 2-D project Drawing in AutoCAD • Conduct Survey • Develop 3-D model using Sketch Up • Develop 3-D model using AutoCAD

4		<ul style="list-style-type: none"> • Organize schedules • Market products and services • Manage Human Resources • Supply Chain Management • Coordinate a Team Work 	<ul style="list-style-type: none"> • Quantity estimation • Develop project management Life cycle • Develop preliminary project plan • Develop project plan • Develop 3D model using Autodesk Revit • Render 3D model using plugin in SketchUp • Develop Basic NC code for lathe machine • Develop Basic 3-D modeling using CREO parametric/ Solidworks • Perform basic operation in Primavera P6 • Apply animation and rendering in 3-D model using Lumion
5		<ul style="list-style-type: none"> • Create User Documentation • Create Technical Documentation • Undertake project work • Negotiate for resolving business issues • Develop Entrepreneurial Skills • Develop and review a business plan • Investigate micro business opportunities • Monitor and review business performance 	<ul style="list-style-type: none"> • Develop basic NC code for milling machine • Perform road project activities scheduling in Primavera P6 • Perform road project resources casting and plaining in Primavera P6 • Manage construction project in Primavera P6 • Develop 3-D model using AutoDesk 3ds Max • Develop advance 3-D modeling using CREO parametric/Solidworks • Perform CAM operation using PowerMill • Design a basic project using BIM technology

4. Packaging of the Qualification on the basis of core competencies

LEVEL-1 (Digital Skill)
<ul style="list-style-type: none">• Perform Computer Operations
LEVEL-2 (core competencies)
<ul style="list-style-type: none">• Perform Basic Manual Drawing• Construct different engineering Curves• Construct multi-view drawings• Manage Display in AutoCAD• Develop 2D drawings in CAD
LEVEL-3 (core competencies)
<ul style="list-style-type: none">• Manipulate images (Photoshop)• Develop 2-D drawing in AutoCAD• Develop basic 2-D project Drawing in AutoCAD• Conduct Survey• Develop 3-D model using Sketch Up• Develop 3-D model using AutoCAD
LEVEL- 4 (core competencies)
<ul style="list-style-type: none">• Develop 3D Model using Autodesk REVIT• Basic 3D Modeling Creo Parametric/Solid works• Manufacturing using Power Mill• Apply Animation and Render3D Model using Lumion• Render 3D Model using Plugins' using Sketch Up• Quantity Estimation• Develop Preliminary Project Plan• Develop Project Plan• Perform Basic operation in Primavera P6• Develop Basic NC code for Lathe Machine
LEVEL-5 (core competencies)
<ul style="list-style-type: none">• Develop basic NC code for milling machine• Perform road project activities scheduling in Primavera P6• Perform road project resources casting and plaining in Primavera P6• Manage construction project in Primavera P6• Develop 3-D model using Autodesk 3ds Max• Develop advance 3-D modeling using CREO parametric/Solid works• Perform CAM operation using Power Mill• Apply animation and rendering in 3-D model using Lumion• Design a basic project using BIM technology

5. Summary of competency standards

Code	Competency Standards	Level	Theory Contact Hours	Practical Contact Hours	Total Contact Hours	Category
1.	Operate digital media technology	1	05	15	20	Generic
2.	Perform Computer Operation	2	05	15	20	Generic
3.	Install OfficeApplication suit	2	05	20	25	Generic
4.	Format Document in MS Word	2	05	60	65	Generic
5.	Operate spreadsheet applications	2	05	60	65	Generic
6.	CreatePresentation In MS Power Point	2	05	40	45	Generic
7.	Use social media tools for collaboration and engagement	3	05	30	35	Generic
8.	Work safely in an office environment	2	10	10	20	Generic
9.	Perform Basic Manual Drawing	2	5	40	45	Technical
10.	Construct different engineering curves	2	5	40	45	Technical
11.	Construct multi-view drawings	2	5	40	45	Technical
12.	Manage basic operations in AutoCAD	2	5	40	45	Technical
Total			65	410	475	
1.	Perform writing and editing tasks in MS Word	2	05	50	55	Generic
2.	Maintain professionalism in the workplace	4	05	05	10	Generic
3.	Manipulate images (Photoshop)	3	10	60	70	Technical
4.	Develop 2-D drawing in AutoCAD	3	10	150	160	Technical
5.	Develop basic 2-D project Drawing in AutoCAD	3	10	120	130	Technical
6.	Conduct Survey	3	20	60	80	Technical
7.	Create Basic Databases	3	10	40	50	Generic

Total			70	485	555	
1.	Organize schedules	4	10	50	60	Generic
2.	Quantity estimation	4	30	60	90	Technical
3.	Develop 3-D model using SketchUp	3	10	90	100	Technical
4.	Develop project management Life cycle	4	10	20	30	Technical
5.	Develop preliminary project plan	4	10	30	40	Technical
6.	Develop project plan	4	10	60	70	Technical
7.	Develop 3-D model using AutoCAD	3	20	90	110	Technical
8.			100	400	500	
Total			100	470	570	
1.	Market products and services	4	10	60	70	Generic
2.	Manage Human Resources	4	10	30	40	Generic
3.	Supply Chain Management	4	20	40	60	Generic
4.	Develop 3D model using Autodesk Revit	4	20	150	170	Technical
5.	Render 3D model using plugin in SketchUp	4	10	120	130	Technical
6.	Develop Basic NC code for lathe machine	4	20	100	120	Technical
Total			90	500	590	
1.	Coordinate a Team Work	4	10	10	20	Generic
2.	Undertake project work	5	10	30	40	Generic
3.	Negotiate for resolving business issues	5	10	20	30	Generic
4.	Develop Basic 3-D modeling using CREO parametric/ Solidworks	4	10	100	110	Technical
5.	Develop basic NC code for milling machine	5	20	80	100	Technical

6.	Perform basic operation in Primavera P6	4	10	60	70	Technical
7.	Perform road project activities scheduling in Primavera P6	5	10	60	70	Technical
8.	Perform road project resources casting and plaining in Primavera P6	5	10	60	70	Technical
9.	Manage construction project in Primavera P6	5	10	60	70	Technical
10.	Develop 3-D model using AutoDesk 3ds Max	5	10	150	160	Technical
Total			110	630	740	
1.	Create User Documentation	5	10	30	40	Generic
2.	Create Technical Documentation	5	10	40	50	Generic
3.	Develop Entrepreneurial Skills	5	10	10	20	Generic
4.	Develop and review a business plan	5	10	40	50	Generic
5.	Investigate micro business opportunities	5	10	10	20	Generic
6.	Monitor and review business performance	5	10	20	30	Generic
7.	Develop advance 3-D modeling using CREO parametric/ Solidworks	5	10	150	160	Technical
8.	Perform CAM operating using PowerMill	4	10	150	160	Technical
9.	Apply animation and rendering in 3-D model using Lumion	4	10	50	60	Technical
10.	Design a basic project using BIM technology	5	10	150	160	Technical
11.			100	650	750	
Total			100	650	750	

6. Occupations of CAD/CAM Technology

Sr. No.	Name of Occupation/Nomenclature	Level	Digital Skills required	Soft Skills required	Entrepreneurship	Technical Skills required
1.	Assistant CAD/CAM designer	5				1 to 27

2.	CAD/CAM Technician	4				1 to 15
3.	3-D modeler	3				7 to 15
4.	CAD operator	3				1-10
5.	CNC programmer	4				11,13,18,19

7. Core Competencies

Code	Competency Standards	(Level- 2)	(Level- 3)	(Level- 4)	(Level- 5)
	1. Perform basic manual Drawings	Level-2			
	2. Construct different Engineering Curves	Level-2			
	3. Construct multi-view drawings	Level-2			
	4. Manage basic operations in AutoCAD	Level-2			
	5. Develop 2D Drawings in AutoCAD	Level-2			
	6. Develop basic 2D project drawing in AutoCAD		Level-3		
	7. Develop 3D Model using AutoCAD		Level-3		
	8. Develop 3D Model using SKETCHUP		Level-3		
	9. Develop 3D Model using REVIT			Level-4	
	10. Develop 3D Model using 3D Studio MAX				Level-5
	11. Develop Basic 3-d Model using CREO parametric			Level-4	

	12. Advance 3-D modeling using CREO parametric				Level-5
	13. Develop model using Power Mill			Level-4	
	14. Apply Animation And Render 3D Model using Lumion			Level-4	
	15. Render 3D Model using Plugins' using SketchUp			Level-4	
	16. Conduct Survey		Level-3		
	17. Conduct Quantity Estimation		Level-3		
	18. Develop NC code for Milling Machine				Level-5
	19. Develop NC code for Lathe Machine			Level-4	
	20. Design a basic Project using BIM Technology				Level-5
	21. Develop project management life cycle		Level-3		
	22. Develop preliminary project plan (21)			Level-4	
	23. Develop Project Plane			Level-4	
	24. Perform Basic operation in Primavera P6			Level-4	
	25. Perform road project activities scheduling in primavera P6				Level-5
	26. Perform road project resource casting and palining in primavera				Level-5

	p6				
	27. Mange construction project in primavera P6				Level-5
	28. Manipulate Images (Photoshop)		Level-3		

8. Date of Validation

The level 5 of National DAE qualification on CAD CAM has been validated by the Qualifications Validation Committee (QVC) members on 27-29th May, 2019 and will remain valid for ten years i.e. **29th May, 2029**

9. Date of Review

The level 5 of National DAE qualification on CAD CAM has been validated by the Qualifications Validation Committee (QVC) members on 27-29th May, 2019 and shall be reviewed after three years i.e. **30TH May, 2022**

10. 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 CAD CAM level 5	
Code	Description
0713E&E(1)	1 st Level D.A. E National Certificate of level-5, in “ CAD CAM”
0713E&E(2)	2 nd Level D.A. E National Certificate of level-5, in “ CAD CAM”
0713E&E(3)	3 rd Level D.A. E National Certificate of level-5, in “ CAD CAM”
0713E&E(4)	4 th Level D.A. E National Certificate of level-5, in “ CAD CAM”
0713E&E(5)	5 th Level D.A. E National Certificate of level-5, in “ CAD CAM”

11. Members of Qualifications Development Committee

The following members participated in the qualification development of this qualification:

S.No.	Name & Designation	Organization
1.	Sadyia Qureshi	Coordinator
2.	Aftab Hussain	DACUM Facilitator
3.	Ali Raza	DACUM Facilitator
4.	Muhammad Abbas Arshad	Site Engineer
5.	Muhammad Faizan	Interior/CAD Designer
6.	Syed Farhan Hamid Ali	Sr. Instructor Pak Swiss Training Center Karachi
7.	Muhammad Hassan Arshad	Architect Bahria Town
8.	Malik Abdul Basit	Consultant (IT & Overseas employment)
9.	Javed Hayat	Consultant (Survey and Research)

12. Members of Qualification Validation Committee

The following members participated in the validation of this qualification:

Sr.No.	Name & Designation	Organization
1.	Dr. Muhammad Bakhsh DD IT/CS	Pakistan Academy of rural development, Peshawar
2.	Jawaria Qazi Web Admin	PBTE , Lahore
3.	Ali Raza	Principal Quaid-e-Azam College of Engineering & Technology Okara
4.	Aftab Hussain	DACUM Facilitator
5.	Nadeem Zaigham Senior Instructor	P-TEVTA
6.	Muhammad Abbas Arshad Project Engineer	United Engineering Pvt Ltd Jehlum
7.	Muhammad Faizan Architectural Designer	Gleaming Architectural
8.	Navid Ali Lecturer	KP-TEVTA
9.	Amjad Waheed Khan Lecturer	KP-TEVTA
10.	Syed Shadab Ali Shah Assistant Professor	KP-TEVTA
11.	Summar Jan Siddiqui	P-TEVTA
12.	Fayaz A Soomro Deputy Director (Technical Education)	NAVTTTC

13. Entry Requirements

The entry for D.A. E National Certificate level 5, in CAD CAM are

1. A person having **National Vocational Certificate level 4**, in CAD CAM.
2. A person having **Matric certificate with Science**

DETAIL OF COMPETENCY STANDARDS

0720-M&P-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.

Competency Units	Performance Criteria
1. Draw single stroke capital vertical lettering.	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Use Proper pencil for lettering with holding techniques.</p> <p>P4. Draw Boundary lines as per standards.</p> <p>P5. Make title bar</p> <p>P6. Draw upper and lower lines for lettering according to standards.</p> <p>P7. Start Writing Vertical Lettering with different style like Gothic, Roman and free hand lettering.</p>
2. Draw single stroke capital inclined lettering.	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Draw upper and lower lines for lettering according to standards.</p> <p>P6. Start Writing inclined Lettering with different style like Gothic, Roman and free hand lettering.</p>
3. Draw horizontal, vertical and inclined lines.	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in different equal parts.</p> <p>P6. Draw lines at 30, 45, 60,90and 120 angles.</p>
4. Draw circles, half circles, radius with compass,	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in different equal parts.</p> <p>P6. Make different diameters circles and half circles.</p>
5. Draw Lines	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in different equal parts.</p>

	<p>P6. Draw Center lines, P7. Draw parallel-lines, P8. Draw perpendicular & bisects line, P9. Draw equal division of lines P10. Make different angle curves. P11. Draw crossing line</p>
<p>6. Draw round corners, circles elements, quadrilaterals inside and outside circle.</p>	<p>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. Make different diameter circles. P7. Make inside and outside different types of diagrams that touch the circles at the tangent points.</p>
<p>7. Construct angles and triangles</p>	<p>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, P7. Scalene Triangle, Right Triangle, Obtuse Triangle, Acute Triangle.</p>

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 the knowledge of:

- Importance of Technical Drawing.
- Language of engineering terminology.
- Uses of Technical Drawing
- Type of Drawing
- Application of Technical drawing
- Drawing Pencil, their grading, sharpening and using techniques.
- Style of letters.
- General rules for lettering
- List of drawing equipment's
- Basic lines
- Importance of lines
- Common Types of lines and correct line weightage.
- Application of lines.
- Introduction to geometry
- Introduction to sketching techniques.
- Introduction to geometry
- Techniques of sketching straight lines in different directions.
- Define Triangles, Quadrilateral, and Polygons.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Draw Circle, Triangle, Square, Rectangle and create a title box for drawing

LIST OF TOOLS AND EQUIPMENT

S. No.	Description
1.	Drawing Board
2.	Drawing Box
3.	Drawing Sheets
4.	T scale
5.	Set squares
6.	Penciles(HB,H,2H) etc.

0720-M&P-2. Construct Different Engineering Curves.

Overview:

This competency standard covers the skills and knowledge required to Construct inscribe and circumscribe figures, Construct a pentagon, Hexagon and Octagon by circumscribe method, Construct a pentagon, Hexagon and Octagon by inscribe method, Construct a Tangents of circles (Inside & Outside) When the centre of the given circle is known and when the circle of centre is not known, Construct an Ellipse by Concentric Circle Method, Rectangle Method, Oblong Method, Arcs of Circle Method, Rhombus Method and Basic Locus Method, Construct a parabola curve by Rectangle Method, Method of Tangents(Triangle Method) and Basic Locus Method, Construct a hyperbola curve, Construct a Archimedean Spiral curve, Construct a involutes curve of square rectangle hexagon and circle and Construct of cycloid, epicycloids, and hypocycloid.

Competency Units	Performance Criteria
1. Construct inscribe and circumscribe figures.	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in different equal parts.</p> <p>P6. Draw square, triangle and hexagon according to dimension.</p>
2. Construct a pentagon, Hexagon and Octagon by circumscribe method.	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in different equal parts.</p> <p>P6. Draw pentagon, Hexagon and Octagon .</p>
3. Construct pentagon, Hexagon and Octagon by inscribe method	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in different equal parts.</p> <p>P6. Draw pentagon, Hexagon and Octagon.</p>
4. Construct Tangents of circles (Inside & Outside)	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in different equal parts.</p> <p>P6. Draw Tangents Inside of a circle When the centre of the circle is known.</p> <p>P7. Draw Tangents Inside of a circle When the centre of the circle is unknown</p> <p>P8. Draw Tangents outside of a circle When the centre of the circle is known</p> <p>P9. Draw Tangents outside of a circle When the centre of the circle is unknown</p>
5. Construct Ellipse	<p>P1. Prepare Drawing sheet.</p>

	<p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in different equal parts.</p> <p>P6. Draw an Ellipse by Concentric Circle.</p> <p>P7. Draw an Ellipse by Rectangle Method</p> <p>P8. Draw an Ellipse by Oblong Method</p> <p>P9. Draw an Ellipse by Arcs of Circle Method</p> <p>P10. Draw an Ellipse by Rhombus Method.</p> <p>P11. Draw an Ellipse by Basic Locus Method</p>
6. Construct a parabola curve	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in different equal parts.</p> <p>P6. Draw a parabola curve by Rectangle</p> <p>P7. Draw a parabola curve by Method of Tangents(Triangle Method)</p> <p>P8. Draw a parabola curve by Basic Locus Method</p>
7. Construct a hyperbola curve	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in different equal parts.</p> <p>P6. Draw a hyperbola curve.</p>
8. Construct a Archimedean Spiral curve	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in different equal parts.</p> <p>P6. Draw spiral curve.</p>
9. Construct involute curve	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in different equal parts.</p> <p>P6. Draw involute curve by square</p> <p>P7. Draw involute curve by rectangle</p> <p>P8. Draw involute curve by hexagon</p> <p>P9. Draw involute curve by circle.</p>
10. Construct of cycloid, epicycloid, and hypocycloid	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in different equal parts.</p> <p>P6. Draw the generating circle and the base line equal to the circumference of the generating</p>

circle

P7. Divide the circle and the base line in to equal number of parts

P8. Complete the cycloid, epicycloids, and hypocycloid.

Knowledge & Understanding

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

- Importance of Technical Drawing.
- Techniques of sketching straight lines in different directions
- Define Triangles, Quadrilateral and Polygons
- Describe circular arc using different line method
- Describe circular arc
- Types of Geometric Shape
- Two-dimensional shapes
- Three-dimensional shapes
- Types of Geometric Shape
- Two-dimensional shapes
- Three-dimensional shapes
- Types of Geometric Shape
- Regular Polyhedrons
- Methods of drawing Tangents & Normal
- Describe ellipse
- Describe different methods of sketching ellipse
- Describe parabola
- Describe different methods of parabola
- Describe hyperbola curve
- Describe different methods of hyperbola curve.
- Describe spiral curve
- Describe involute curve
- Describe cycloid
- Describe epicycloids
- Describe hypocycloid

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Draw Pentagon
- Draw Parabola
- Draw splines and B-curves
- Draw spiral curve

LIST OF TOOLS AND EQUIPMENT

Sr. No.	Description
1.	Drawing Board
2.	Drawing Box
3.	Drawing Sheets

0720-M&P-3.Construct Multi-View Drawings

Overview:

This competency standard covers the skills and knowledge required to Sketch Orthographic projection 1st angle, Sketch Orthographic projection 3rd angle, Sketch Oblique Drawing, Construct multi view drawing of Simple Bearing, Construct multi view drawing of Open Bearing, Sketch prism, Sketch cone and Draw pyramid.]

Competency Units	Performance Criteria
1. Sketch Orthographic projection in 1 st angle of Projection	P1. Prepare Drawing sheet. P2. Select the tools. P3. Draw Boundaries lines as per standards. P4. Make title bar P5. Divide the sheets in equal parts. P6. Draw plan view P7. Draw front view P8. Draw side view
2. Sketch Orthographic projection 3rd angle of Projection	P1. Prepare Drawing sheet. P2. Select the tools. P3. Draw Boundaries lines as per standards. P4. Make title bar P5. Divide the sheets in equal parts. P6. Draw plan view P7. Draw front view P8. Draw side view
3. Sketch Oblique Drawing	P1. Prepare Drawing sheet. P2. Select the tools. P3. Draw Boundaries lines as per standards. P4. Make title bar P5. Divide the sheets in equal parts P6. Draw the front or side view of the object.
4. Construct multi view drawing of Simple Bearing.	P1. Prepare Drawing sheet. P2. Select the tools. P3. Draw Boundaries lines as per standards. P4. Make title bar P5. Divide the sheets in equal parts. P6. Draw plan view of simple bearing P7. Draw front view of simple bearing P8. Draw side view of simple bearing
5. Construct multi view drawing of Open Bearing	P1. Prepare Drawing sheet. P2. Select the tools. P3. Draw Boundaries lines as per standards. P4. Make title bar P5. Divide the sheets in equal parts. P6. Draw plan view of open bearing P7. Draw front view of open bearing P8. Draw side view of open bearing
6. Sketch prism	P1. Prepare Drawing sheet. P2. Select the tools.

	<p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in equal parts.</p> <p>P6. Sketch prism</p>
7. Sketch cone	<p>P1. Prepare Drawing sheet.</p> <p>P2. Select the tools.</p> <p>P3. Draw Boundaries lines as per standards.</p> <p>P4. Make title bar</p> <p>P5. Divide the sheets in equal parts.</p> <p>P6. Start with a horizontal oval</p> <p>P7. Draw the two sides of a triangle which meets at a common point</p>
8. Draw pyramid	<p>P1. Select the tools.</p> <p>P2. Draw Boundaries lines as per standards.</p> <p>P3. Make title bar</p> <p>P4. Divide the sheets in equal parts.</p> <p>P5. Sketch pyramid</p>

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 the knowledge of:

- Importance of Technical Drawing.
- Explain Orthographic projection 1st angle.
- Explain Orthographic projection 3rd angle.
- Explain Oblique Drawing.
- Explain Multi view drawing of Simple Bearing.
- Explain Prism, Cone and pyramid

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Draw Ortho projection
- Draw Prism and cone
- Draw Pyramid

LIST OF TOOLS AND EQUIPMENT

Sr. No.	Description
1.	Drawing Board
2.	Drawing Box
3.	Drawing Sheets

0720-M&P-4.Manage basic operations in AutoCAD

Overview:

This competency standard covers the skills and knowledge required to install software and create new file and create basic drawing.

Competency Units	Performance Criteria
1. Install software and Create New File	P1. Install latest software version P2. Create New Template P3. Save the File P4. Create Drawing P5. Select units as per requirements P6. Select drawing Limits
2. Create Basic Drawings	P1. Select Coordinate System as per requirements P2. Draw a rectangle using line command P3. Draw an ARC P4. Draw a circle with given requirements P5. Draw a circle with 3-P touching outer corner of Equilateral Triangle P6. Use the Erase Command

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 the knowledge of:

- Basic Drawing Settings
- Unit setting
- Limits setting
- User coordinate system Workspace setting
- Object Snap Settings
- Basic Commands and Concepts Angles and lines in AutoCAD.
- Differentiate between absolute, relative and polar system
- DIMSTYLE and MTEXT commands
- HATCHING concepts in AutoCAD
- Differentiate between CHAMFER and FILLET command
- Types of Array
- OFFSET, CIRCLE and ROTATE short commands
- Zooming options
- Tools palettes window
- Design center
- Scale and paper sizes
- Modify dimension style and text size according to paper size
- Backup file

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Install Software

- Draw Circle with all possible combination

LIST OF TOOLS AND EQUIPMENT

Sr. No.	Description
1.	PCs/Laptops
2.	Multimedia Projector
3.	AutoCAD Software
4.	Printer

0720-M&P-5.Develop 2D Drawings in AutoCAD

Overview:

This competency standard is designed to provide skills and knowledge to create 2-Dimensional drawings by using various tools and commands. You can create and modify objects and drawings in CAD to meet specific targets according to job requirements.

Competency Units	Performance Criteria
1. Create a Manual Drawing	<p>P1. Create a free hand sketches of given objects.</p> <p>P2. Draw geometrical shapes of given objects.</p> <p>P3. Draw orthographic views of given objects.</p> <p>P4. Draw auxiliary view of given objects.</p> <p>P5. Create an isometric view of given object.</p> <p>P6. Create an oblique view of given object.</p> <p>P7. Create sectional view of given object.</p>
2. Develop 2D Objects	<p>P1. Setup drawing interface for required specifications.</p> <p>P2. Setup user interface settings for required specifications.(for UCS)</p> <p>P3. Save AutoCAD drawing files in CAD file format.</p> <p>P4. Create layout as per given specification.</p> <p>P5. Create 2d plan as per given dimension.</p> <p>P6. Create section of given plan.</p> <p>P7. Create elevation for given plan with specified dimensions.</p> <p>P8. Edit drawing as per given requirement changes.</p> <p>P9. Create 2D objects with given measurements.</p> <p>P10. Edit 2D Objects to meet set standards.</p>
3. Prepare Final Set of 2D Drawings	<p>P1. Use appropriate commands and tools for developing 2d drawing.</p> <p>P2. Create set of working drawings with given project specification.</p> <p>P3. Plot drawing on scale according to required size and orientation.</p>

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 the knowledge of

- **Basic drawing concepts**
 - Alphabets of line
 - Geometrical shapes
 - Geometrical section
 - Types of views
 - Dimensioning
- **Basic drawing setting**
 - Unit setting
 - Limits setting
 - User coordinate system
 - Workspace setting

- Sheet composition
- Object Snap Settings
- Scale.
- **Basic commands and concepts**
 - Angles and lines in AutoCAD
 - Differentiate between absolute, relative and polar system
 - DIMSTYLE and MTEXT commands
 - HATCHING concepts in AutoCAD
 - Differentiate between CHAMFER and FILLET command
 - Types of Array
 - OFFSET, CIRCLE, ROTATE and short command setc..
 - Zooming options
 - Tools palettes window
 - Design center
 - Scale and paper sizes
 - Backup file

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

1. Set of 2D Drawings including Plan, working plan, section, elevation, legend, schedule, areas & measurements.

LIST OF TOOLS AND EQUIPMENT

Sr. No.	Description
1.	PCs/Laptops
2.	Multimedia Projector
3.	Drawing Board
4.	Drawing Box
5.	Drawing Sheets
6.	AutoCAD Software
7.	Printer
8.	Paper
9.	T/Set square

0720-M&P-6. Develop 3D Model Using AutoCAD

Overview:

This competency standard is designed to provide skills and knowledge to create 3-Dimensional models by using various tools and commands in AutoCAD software. You can demonstrate your skills to modify 3D objects and models to ensure job requirements. You can present a rendered 3D Model to present final outcomes.

Competency Units

Performance Criteria

1. Develop 3D Objects	P1. Setup 3D drawing interface for required specifications. P2. Setup 3D user interface settings for required specifications. P3. Create 3D objects with given measurements.
2. Manipulate 3D objects using 3D Editing Tools	P1. Modify 3D objects in line with the requirements. P2. Make customized 3D models according to the requirement of given job. P3. Convert 3D Face objects into a single mesh objects.
3. Render 3D Model	P1. Apply material to required 3D Model as per given specification P2. Apply lights to get the requisite scene of required 3D model P3. Assign cameras to execute different views of required 3D Model. P4. Render and print the 3D model according to required size & orientation. P5. Apply texture to 3D model as per given specification.

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 the knowledge of:

- **3D modeling in AutoCAD**
 - 3D solids,
 - surfaces,
 - meshes,
 - Wireframe objects.
 - Differentiate between Surface Modeling and Solid Modeling.
 - 3D face and Edges
- **Boolean operation concepts**
 - Subtraction
 - Intersection
 - Union
- **3D Navigate control**
 - Functions of different camera settings.
 - Importance of scene creation
 - Preset views such as isometric, top, bottom, front, left, etc.
 - Perspective projection and parallel projection
 - Walk
 - Constrained Orbit
- **Material and light control**
 - Planner mapping
 - Texture map

- Opacity control
- Render context
- Render sampling

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Rendered 3D prototype Model including materials, lights, scene and different camera views.

LIST OF TOOLS AND EQUIPMENT

Sr. No.	Description
1.	PCs/Laptops
2.	Multimedia Projector
3.	AutoCAD
4.	Paper
5.	Printer

0720-M&P-7. DEVELOP Basic 2D project drawing in AutoCAD

Overview:

This competency standard covers the skills and knowledge required to Printout on A4 paper drawings of c-type residential building, Printout on A2 paper submission drawings of a small two story R.C.C. framed structure building, Printout on A4 paper x-sections of canals, drains and roads and Printout on A4 paper drawings of masonry 10 ft. segmental arched culvert.

Competency Units	Performance Criteria
1. Prepare & printout on A4 paper drawings of c-type residential building.	<p>P1. Setup drawing interface for required specifications</p> <p>P2. Setup user interface settings for required specifications</p> <p>P3. Draw detailed plan of C type building.</p> <p>P4. Draw front & side elevation of C type building.</p> <p>P5. Draw x-section of C type building.</p> <p>P6. Adjust layouts in viewports for printing C type building.</p>

	P7. Print the drawings
2. Prepare & printout on A2 paper submission drawings of a small two story R.C.C. framed structure building	P1. Setup drawing interface for required specifications P2. Setup user interface settings for required specifications P3. Draw detailed plans of framed structure building. P4. Draw front & side elevation of framed structure building. P5. Draw site plan, layout plan of framed structure. P6. Draw x-sections of framed structure building. P7. Draw reinforcement detail of RCC structures. P8. Adjust layouts in viewports for printing frame structure building. P9. Print the drawings
3. Prepare & printout on A4 paper x-sections of canals, drains and roads.	P1. Setup drawing interface for required specifications P2. Setup user interface settings for required specifications P3. Draw cross section of canal fully in cutting, fully in filling and partly in cutting & partly in filling. P4. Draw cross section of national highway dual carriage in rural and built up area. P5. Draw cross section of district highway double lane in rural and built up area. P6. Draw x-sections of type-I, type-II & type 8 drains P7. Adjust layouts in viewports for printing frame structure building. P8. Print the drawings
4. Prepare & printout on A4 paper drawings of masonry 10 ft. segmental arched culvert.	P1. Setup drawing interface for required specifications P2. Setup user interface settings for required specifications P3. Draw detailed plan, & layout plan of culvert. P4. Draw long section & cross section of culvert. P5. Draw elevation of culvert. P6. Adjust layouts in viewports for printing frame structure building. P7. Print the drawings

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 the knowledge of:

- Modify dimension style and text size according to paper size
- Apply drafting settings (Unites, Limits, Snap, Auto On & Off) and their application
- describe layer options, dimensioning & text and their application
- Explain features of dimensioning & text options and their application
- Explain layout settings & printing of CAD drawings and their application

- Explain integration of total station with AutoCAD & MS Excel and their application
- Explain how to extend, trim, stretch, break and scale drawn items.
- Explain how to edit properties of objects.
- Describe the purpose and use of the use of blocks and symbols.
- Describe adjustment of layouts along with viewports for printing.
- Describe the procedure of printing drawings.

Critical Evidence(s) Required

The candidate needs to produce following critical evidences in order to competent in this competency standard.

- Printout on A4 paper drawings of c-type residential building.
- Printout on A2 paper submission drawings of a small two story R.C.C. framed structure building
- Printout on A4 paper x-sections of canals, drains and roads.
- Printout on A4 paper drawings of masonry 10 ft. segmental arched culvert.

Tools and Equipment:

Sr. No.	Description
1.	Computer latest model with Server
2.	Computer latest model work stations
3.	Laptop computer
4.	Net working
5.	UPS 2000 Watt with batteries
6.	Multimedia Projector
7.	Scanner for A-3 paper
8.	Printer LaserJet
9.	Plotter LaserJet A-0 Size
10.	Computer Chair (will be added in furniture portion) without arm rest – 5 legs base
11.	Computer Table (will be added in furniture portion) 2½ x 2 x 2½
12.	License software for education Latest Versions: Auto CAD M.S Office Antivirus Microsoft windows

0720-M&P-8.Develop 3D Model using Sketch Up

Overview:

This competency standard is designed to provide drawing and designing tools using Sketch Up. You can use this software to work under real-world time constraints. From broadcasters to designers, architects and engineers, virtually every industry uses Sketch Up to create prototype models and animate 3D objects and environments

Competency Units	Performance Criteria
1. Develop 3D Objects	<p>P1. Set up template for required specifications.</p> <p>P2. Import/create 2D Drawing/image as per assigned specification.</p> <p>P3. Create 3D object from 2D drawing/image in line with given measurements.</p>
2. Modify 3D objects	<p>P1. Navigate 3D objects as per required job.</p> <p>P2. Modify 3D objects in line with the requirements.</p>
3. Apply material and textures on 3D objects	<p>P1. Create/assign specified materials and textures to 3D Model.</p> <p>P2. Edit materials and textures to get realistic outcome.</p>
4. Render 3D model	<p>P1. Install plug-ins to meet specific outcome as per requirement.</p> <p>P2. Add scene of 3D model according to specification</p> <p>P3. Add lights for illumination to get the requisite scene of 3D model.</p> <p>P4. Assign cameras to execute different views of 3D Model.</p> <p>P5. Add Render Components to make scene more realistic.</p> <p>P6. Render the 3D model according to required image size or resolution & orientation.</p>

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 the knowledge of:

- **Templates.**
 - Simple template
 - Architectural design
 - Construction documentation
 - Urban planning
 - 3D Printing
- **Basic commands and concepts**
 - Axes in Sketch up
 - Short commands Line, rectangle and circle
 - Push/Pull
 - Short command of Pan and Orbit
 - Protractor Tool and Tape Measure Tool
 - Scaling and Stretching

- Scale and paper sizes
- Different modeling techniques.
- Different types of materials and textures.
- Shadow and fog views.
- Principles of lighting and rendering.
- Two-Point perspective

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Rendered 3D prototype Model including materials, textures, lights, scene and different camera views.

LIST OF TOOLS AND EQUIPMENT

S. No.	Description
1.	PCs/Laptops
2.	Multimedia Projector
3.	Sketch Up
4.	AutoCAD
5.	Paper
6.	Printer
7.	IRender
8.	VRay
9.	Lumion

0720-M&P-9.Develop 3D Model using REVIT

Overview:

This competency standard is designed to provide skills and knowledge to use Autodesk Revit for building information modeling which is widely used by architects, structural engineers, MEP engineers, designers and contractors. This software application allows you to design a building, structure and various related components in 3D, annotate the model with drafting elements.

Competency Units	Performance Criteria
1. Setup Interface	<p>P1. Create custom user interface as per requirement of specific trade.</p> <p>P2. Create and apply Families as per given specifications and requirements.</p>
2. Create building layout	<p>P1. Create/import drawings to make layout according to the given requirements.</p> <p>P2. Modify drawings and objects to meet given criteria</p> <p>P3. Create 3D prototype model of the drawing according to given measurements.</p>
3. Create construction document	<p>P1. Create specification/detail for various parts according to given requirements.</p> <p>P2. Apply specified detail to objects according to given requirements.</p> <p>P3. Annotate the drawings using set parameters as per given details.</p>
4. Render model	<p>P1. Add scene of 3D model according to specification</p> <p>P2. Add lights for illumination to get the requisite scene of 3D model.</p> <p>P3. Apply material to the 3D model as per given specification.</p> <p>P4. Apply texture to 3D model as per given specification.</p> <p>P5. Assign cameras to execute different views of 3D Model.</p> <p>P6. Render the 3D model according to required image size or resolution & orientation.</p>

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 the knowledge of:

- Terms and Concepts
- Level
- Snaps and Guides
- Level Constraint
- Families
- Annotation Families
- Schedules

- Sheets
- View Cube
- Tiled Views
- Different layouts of software for specific field.
- Commands and tools.
- Pick Tools (Walls, Lines, Edges)
- Chain Option
- Annotation and detailing.
- Massing and site.
- Import/Export.
- Principles of lighting and rendering.
- Materials, textures and colors.
- Cameras and navigation of 3D environment.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Construction documents.
- Rendered 3D prototype Model.

LIST OF TOOLS AND EQUIPMENT

S. No.	Description
1.	PCs/Laptops
2.	Multimedia Projector
3.	Revit
4.	AutoCAD
5.	Paper
6.	Printer
7.	IRender
8.	VRay
9.	Lumion

0720-M&P-10. Develop 3D Model Using Autodesk 3ds Max

Overview:

This competency standard is designed to provide a comprehensive 3ds Max modeling and rendering solution to interior designers, architects and engineers (electrical/mechanical/civil). You can cover the interface and proper workflow for setting up 3ds Max projects with cameras, lighting, and rendering. You can handle more complex scenarios and techniques which are found in 3ds Max.

Competency Units	Performance Criteria
1. Create Objects using geometry and shapes	<p>P1. Create/import/link/fetch/merge 2D drawing to make 3D objects according to given specification</p> <p>P2. Use Geometry & shapes t make 3D objects according to given specification.</p>
2. Modify objects	<p>P1. Modify Parameters of 3D objects according to given specification.</p> <p>P2. Apply modifiers for object manipulation to meet the specific requirements.</p>
3. Apply material and textures to objects	<p>P1. Create/assign specified materials and textures to 3D Model.</p> <p>P2. Edit materials and textures to get realistic outcome.</p>
4. Render 3D model	<p>P1. Assign/Install Renderer to meet specific outcome as per requirement.</p> <p>P2. Add scene of 3D model according to specifications</p> <p>P3. Add lights for illumination to get the requisite scene of 3D model.</p> <p>P4. Assign cameras to execute different views of 3D Model.</p> <p>P5. Render the 3D model according to required image size or resolution & orientation.</p>

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 the knowledge of:

- 3D prototype models for presentations.
- Principles of lighting and rendering.
- Modeling techniques.
- Materials, textures and colors.
- Reflection and Refraction.
- Cameras and navigation of 3D environment.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Rendered 3D prototype Model including materials, textures, colors, viewports, lights, scene and different camera views.

LIST OF TOOLS AND EQUIPMENT

S. No.	Description
1.	PCs/Laptops
2.	Multimedia Projector
3.	3ds Max
4.	AutoCAD
5.	Paper
6.	Printer
7.	IRender
8.	VRay
9.	Lumion

0720-M&P-11.Develop Basic 3D Modelling using CREO parametric/solid work

Overview:

This competency standard is designed to provide knowledge and skill of basic 3D modeling. It emphasizes on creating 2D sketch, modifying sketch, and creating simple 3D sketch.

Competency Unit	Performance Criteria
<p>1. Software interface and Customization</p>	<p>P1. Setup Interface as per requirement. P2. Select menus as per requirements. P3. Select working directory for given job. P4. Select appropriate module for the given task. P5. Configure the software for part modeling P6. Select datum plans/point/datum axes accordingly. P7. Create and save template as per job requirement</p>
<p>2. Create 2D Sketch</p>	<p>P1. Select working plan for the given job P2. Create sketch using lines P3. Create sketch using circles and arcs P4. Create sketch using rectangle P5. Create the sketch as per requirement</p>
<p>3. Apply modify commands</p>	<p>P1. Apply offset feature to the given sketch P2. Apply project feature to the given sketch P3. Apply trim to the given sketch P4. Apply chamfer to the given sketch P5. Apply fillet to the given sketch P6. Apply dimension to the given sketch</p>
<p>4. Apply Geometric Constraints</p>	<p>P1 Apply parallel constraint to the given sketch entity P2 Apply perpendicular constraint to the given sketch entity P3 Apply equal constraint to the given sketch entity P4 Apply tangent constraint to the given sketch entity P5 Apply collinear constraint to the given sketch entity P6 Apply horizontal constraint to the given sketch entity P7 Apply vertical constraint to the given sketch entity. P8 Apply concentric constraint to the given sketch entity</p>
<p>5. Create Simple 3D part using Extrude</p>	<p>P1 Create sketch as per requirements P2 Extrude sketch as per given specification P3 Apply extrude cut to remove material from given sketch P4 Apply flip extrude direction as specified P5 Apply material to object as per specification.</p>

6. Create 3D part using revolve feature	P1 Create sketch as per given requirements P1 Create axis of rotation P2 Apply revolve feature P3 Manage the angle of rotation P4 Create revolve cut using revolve feature P5 Edit the parameter of revolve feature P6 Apply material to object as per specification.
7. Apply features to 3d model	P1 Apply thicken to the 3d model P2 Apply round feature to the 3d model P3 Apply shell feature to the 3d model P4 Apply hole feature to the 3d model P5 Apply draft feature to the 3d model P6 Apply rib feature to the 3d model P7 Apply slice feature to the 3d model
8. Edit 3D model	P1 Edit dimension of the given 3d model P2 Edit features of the given 3D model P3 Reorder feature in the given 3D model P4 Edit references of the 3D model P5 Apply pattern tool as per given specifications.

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 the knowledge of:

- Software interface
- Identify sketch environment
- Sketch entities
- Editing entities
- Geometric constraints
- 3D editing tools
- Features
- Geometric constraints
- Revolve
- Extrude

Critical Evidence Required:

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Produce 2D sketch as per given requirements
- Produce 3D model using extrude and use edit features to edit the model
- Produce 3D revolve model and edit the model as per given specification.

List of Tool & Equipment

S. No	Tools
1.	PCs/Laptop
2.	Solid works/ Cero Parametric
3.	Printer

0720-M&P-12. Develop Advance 3D Modelling using CREO Parametric
Overview:

This competency standard is designed to provide knowledge and skills regarding advance modeling tools. In addition to advance modeling tools it covers working in drawing, assembly modules and creating animation of assembly.

Competency Unit	Competency Standard
1. Create sweep and helical sweep	P1 Create sketch for sweep command as per given requirements. P2 Perform sweep command P3 Remove material using sweep as per specification. P4 Edit sketch of sweep section as per requirements. P5 Edit parameters for sweep as per requirements. P6 Perform helical sweep as per specifications P7 Edit the features of helical sweep such as pitch, coil diameter and spring diameter as per given requirements. P8 Remove material using helical sweep as per given requirements. P9 Apply material to the 3D model as per given requirements.
2. Create 3d using Blend	P1 Create plans for swept blend P2 Create sections for blend as per given requirements. P3 Create parallel blend P4 Create general blend P5 Create rotational blend P6 Edit the sections for blend as per given requirements.
3. Create 3d using swept blend	P1. Create plan for swept blend as per given requirements. P2. Create sections for swept blend as per requirements. P3. Edit sections of swept blend P4. Edit parameters of swept blend P5. Create swept blend (Mini Project)
4. Create Drawings of 3D model	P1. Define drawing layout P2. Import model to drawing mode P3. Manage paper templet as per given requirements. P4. Manage/configure the properties of view P5. Extract view from existing view

	<p>P6. Create default view</p> <p>P7. Create section view</p> <p>P8. Create detail view</p> <p>P9. Annotate the view and apply dimensions</p> <p>P10. Edit annotations</p> <p>P11. Mini project</p>
5. Create Assembly drawing	<p>P1 Import part to assembly module</p> <p>P2 Apply default constraint to the part as per requirements.</p> <p>P3 Apply coincident constraint to the part as per requirements.</p> <p>P4 Apply distance constraint to the part as per requirements.</p> <p>P5 Apply parallel constraint to the part as per requirements.</p> <p>P6 Apply coplanar constraint to the part as per requirements.</p> <p>P7 Apply center constraint to the part as per requirements.</p> <p>P8 Explode assembly to view all the parts of assembly.</p> <p>P9 Edit parts in assembly</p> <p>P10 Mini project</p>
6. Create Animation of Assembly	<p>P1 Import model into assembly module</p> <p>P2 Apply animation constraints (e.g. Pin, slider, cylinder, planner, ball) as per requirement of the given assembly</p> <p>P3 Take the snapshots at different intervals.</p> <p>P4 Create animation from snapshots</p> <p>P5 Specify time for the animation</p> <p>P6 Create video of animation</p> <p>P7 Save the video</p>

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 the knowledge of:

- Sweep and helical sweep
- Blend and swept blend
- Drawing
 - Drawing views
 - Section views
 - Details views
 - Annotation
- Types of assembly
 - Top Down approach
 - Bottom up approach
 - Assembly constraints

- Animation
- Animation constraints

Critical Evidence Required:

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Produce 3D model having feature of sweep and sweep cut, edit the parameters of the model according to requirements.
- Produce helical springs and helical cuts and editing the parameters as per requirements.
- Producing assembly as per requirements
- Producing drawing, section drawing, and detail drawings as per requirements.
- Produce the animation of the given assembly and create video of the animation.

List of Tool & Equipment

S. No	Tools
1.	PCs/Laptop
2.	Solid works/ Cero Parametric
3.	Printer
4.	Paper

0720-M&P-13.Perform CAM operation using Power Mill

Overview:

This competency standard will provide skills and knowledge related to use of software in a range of different engineering industries to determine optimal tool paths to reduce time and manufacturing costs as well as reduce tool loads and produce smooth surface finishes. Further the trainee will be able to create/export NC code in Power mill application to create Job.

Competency Unit	Performance Criteria
1. Setup Machining details	P1 Import the given 3D model in power mill P2 Define tool as per requirements of machining P3 Define block for the machining P4 Examine the model parameters P5 Find minimum radius and draft angle of given 3D model P6 Use measuring tool P7 Set feed rates for machining P8 Define rapid moves and heights P9 Define start and end point of machining P10 Define boundaries for machining
2. Setup work plan and coordinate	P1 Import given 3D model to the power mill P2 Select the work plan as per requirements P3 Edit/rotate work plan P4 Define coordinate for the plan as per requirements P5 Edit/rotate coordinates
3. Perform 3D Area clearance	P1 Apply offset area clearance strategy P2 Apply profile area clearance strategy P3 Apply raster area clearance strategy P4 Perform raster machining
4. Create finishing strategy	P1 Apply 3D offset finishing strategy P2 Apply constant Z- height finishing strategy P3 Optimize constant Z-height finishing strategy P4 Apply offset flate finishing strategy P5 Apply raster finishing strategy P6 Apply radial finishing strategy P7 Apply patten finishing strategy P8 Apply spiral finishing strategy P9 Apply surface finishing strategy
5. Perform 2D area clearance machining	P1 Apply face milling strategy P2 Apply 2D curve area clearance strategy P3 Perform Drilling strategy
6. Define Postprocessor and NC code	P1 Select the appropriate postprocessor as per requirements P2 Create NC code P3 Save NC code P4 Edit NC code as per requirements P5 Simulate the NC code.
	P1 Import the 3D model in Power Mill

7. Mini Project

- P2** Define stock block for the 3D model
- P3** Edit the block parameters as per requirements
- P4** Define plan for the machining as per requirements
- P5** Define coordinate system
- P6** Edit the coordinate system as per requirements
- P7** Define speed and feed rate
- P8** Define rapid moves and heights
- P9** Apply 3D area clearance strategy as per requirements
- P10** Apply 3D finishing strategy as per requirements
- P11** Create the tool path for the strategies
- P12** Edit tool path to optimize the machining timing.
- P13** Select the appropriate post processor
- P14** Create NC code for the machining
- P15** Save the NC code

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 the knowledge of:

- Software GUI
 - Tool bars
 - Menus
 - Viewing Option
- Define stock
- Step over
- Step down
- Differentiate between High-efficiency roughing and rest-roughing
- Rest Machining
- Define 3-axis roughing programs
- Describe purpose of small cutter
- Define Tip Radius
- Define Tool Family
- Elaborate 3D offset
- Patterns concept

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Create workplace and level setting for the Job
- Apply Roughing/ Area Clearance strategy
- Apply Finishing tool-path strategy
- Export NC code to develop job.

LIST OF TOOLS AND EQUIPMENT

Sr .No.	Description
1.	PCs/Laptops
2.	Multimedia Projector
3.	Power Mill
4.	USB

0720-M&P-14. Apply Animation and Render 3D Model using Lumion

Overview:

This competency standard is designed to provide skills and knowledge to apply animation and render models by using various tools in Lumion software. You can demonstrate your skills to modify 3D objects and models to enhance esthetics of model to ensure job requirements. You can present a rendered 3D Model to present final outcomes.

Competency Units	Performance Criteria
1. Render Model using Lumion.	<p>P1. Install Lumion 3D modeling software.</p> <p>P2. Import 3D Model to Lumion as per job requirement.</p> <p>P3. Apply textures to the 3D model as specified.</p> <p>P4. Apply light to illuminate model to get the required scene of image.</p> <p>P5. Apply shadow of 3D object according to the movement of light.</p> <p>P6. Apply material to the object as per given requirement.</p> <p>P7. Apply render to the 3D model as per given requirement.</p> <p>P8. Add scene for different camera views of 3D model as per requirement.</p> <p>P9. Built environment according to the requirement.</p>
2. Apply animation using Lumion	<p>P1. Convert given CAD 3D model into 3D flythrough video.</p> <p>P2. Add motions to clouds and live/moving objects.</p> <p>P3. Apply directions to the moving objects.</p> <p>P4. Add timeline to the movement of the object.</p> <p>P5. Apply movement of shadows according to the movement of light.</p> <p>P6. Apply setting of camera according to the movement of light and object.</p>

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 the knowledge of:

- **3D modeling in Lumion**
 - Import/export
 - 3D model to 3D flythrough video
 - Materials
 - Textures
- **Boolean operation concepts**
 - Addition
 - Intersection
 - Union
- **3D Navigate control**
 - Functions of different camera settings.
 - Importance of scene creation

- Preset views such as isometric, top, bottom, front, left, etc.
- Perspective projection and parallel projection
- Movement of objects
- Constrained Orbit

- **Material and light control**
 - Planner mapping
 - Texture map
 - Opacity control
 - Render context
 - Render sampling

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Rendered 3D prototype Model including materials, lights, scene and different camera views.

LIST OF TOOLS AND EQUIPMENT

Sr.No.	Description
1.	PCs/Laptops
2.	Multimedia Projector
3.	3ds Max
4.	AutoCAD
5.	Paper
6.	Printer
7.	Sketch up
8.	Lumion
9.	Revit

0720-M&P-15.Render 3D Model using Plugins' using Sketch Up

Overview:

This competency standard is designed to provide skills and knowledge to render models by using various tools and commands in plugin software. You can demonstrate your skills to modify 3D objects and models to ensure job requirements. You can present a rendered 3D Model to present final outcomes.

Competency Units	Performance Criteria
1. Render Model using V-Ray	<p>P1. Install V-Ray software to meet the specific outcome as per requirement.</p> <p>P2. Apply textures to the 3D model as specified.</p> <p>P3. Apply light to illuminate model to get the required scene of image.</p> <p>P4. Apply shadow of 3D object according to the movement of light.</p> <p>P5. Apply material to the object as per given requirement.</p> <p>P6. Apply render to the model as per given requirement.</p> <p>P7. Add scene for different camera views to elaborate the model.</p>
2. Render Model using Key shot for solid works.	<p>P1. Install Key shot software to meet the specific outcome as per requirement.</p> <p>P2. Apply textures to the 3D model as specified.</p> <p>P3. Apply light to illuminate model to get the required scene of image.</p> <p>P4. Apply shadow of 3D object according to the movement of light.</p> <p>P5. Apply material to the object as per given requirement.</p> <p>P6. Apply render to the model as per given requirement.</p> <p>P7. Add scene for different camera views to elaborate the model.</p>

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 the knowledge of:

- **3D Rendering**
 - 3D solids,
 - surfaces,
 - Purpose of rendering.
- **Boolean operation concepts**
 - Addition
 - Intersection
 - Union
- **3D Navigate control**
 - Functions of different camera settings.

- Importance of scene creation
- Preset views such as isometric, top, bottom, front, left, etc.
- Perspective projection and parallel projection
- Walk
- Constrained Orbit
- **Material and light control**
 - Planner mapping
 - Texture map
 - Opacity control
 - Render context
 - Render sampling

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Rendered 3D prototype Model including materials, lights, scene and different camera views.

LIST OF TOOLS AND EQUIPMENT

Sr. No.	Description
1.	PCs/Laptops
2.	Multimedia Projector
3.	3ds Max
4.	AutoCAD
5.	Paper
6.	Printer
7.	Sketch up
8.	Lumion
9.	Revit
10.	Solidworks
11.	Keyshot
12.	V-Ray

0720-M&P-16.Conduct Survey

Overview:

This competency standard is designed to provide skills and knowledge to conduct survey by using various tools. You can demonstrate your skills to modify the level of the area to ensure job requirements.

Competency Units	Performance Criteria
1. Manage Information.	P1. Collect and manage information about project

	<p>from the given parameters.</p> <p>P2. Select site as per job requirement.</p> <p>P3. Make layout of given site.</p> <p>P4. Load analysis for the given job.</p>
2. Conduct compass Survey.	<p>P1. Select compass as per given requirement.</p> <p>P2. Set compass as per standard procedure.</p> <p>P3. Find and note bearing as per job requirement.</p> <p>P4. Draw traverse of given project.</p>
3. Conduct leveling.	<p>P1. Identify different type of level.</p> <p>P2. Calculate rise and fall of the given site area.</p> <p>P3. Create level sheet of given site area.</p>

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 the knowledge of:

- **Survey**
 - Unit conversion.
 - Knowledge about equipment.
 - Type and purpose of survey.
- **Compass Survey**
 - Type of bearing
 - Method of compass survey
 - Traversing
 - Triangulation
 - Magnetic deflection
 - Dip
 - Meridian
- **Leveling**
 - Change point.
 - Bench mark.
 - Reduce level.
 - Methods of leveling
- **Material**
 - Interaction.
 - Knowledge about material.
 - Load bearing
 - Modification of load.
 - Calculation of load.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Perform layout for the given task and produce level sheet as per standard procedure.

LIST OF TOOLS AND EQUIPMENT

Sr. No.	Description
1.	Compass
2.	Total Station
3.	Auto Level
4.	AutoCAD
5.	Note Book
6.	Level Book
7.	Staff Rod

0720-M&P-17. Conduct Quantity Estimation

Overview:

This competency standard is designed to provide skills and knowledge related to quantity estimation. You will be able to demonstrate skills in unit conversion, area, volume calculation and conduct quantity estimation to meet specific target according to the job requirement.

Competency Units	Performance Criteria
1. Convert Unit.	P1. Convert unit. P2. Make Unit Coherent.
2. Calculate Area.	P1. Calculate surface area of regular shapes. P2. Convert complex surface area into regular areas. P3. Calculate area of complex surface.
3. Calculate Quantities.	P1. Calculate volume of given object. P2. Calculate execution. P3. Calculate volume of concrete from given drawings. P4. Calculate B/W (Brick Work) as per given drawing. P5. Calculate Plaster as per the given requirement.

- P6.** Calculate material requirement for different projects.
- P7.** Make bar bending schedule from given drawing.
- P8.** Calculate earth work. (Cut and fill) as per the Job requirement.
- P9.** Calculate Material requirement for Infrastructural Development Project.
- P10.** Make demand List of material as per Project Requirement.
Make BOQ (Bill of Quantity) of Project.

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 the knowledge of:

- Unit and volume conversion.
- Knowledge about surface area.
- Type and purpose of quantity.
- Volume calculation
- Cut length of steel
- Ratio proportion
- Wet dry ratio
- Bill of quantity
- Knowledge about specification
- Mortar ratio
- **Material**
 - Interaction.
 - Knowledge about material.
 - Load bearing
 - Modification of load.
 - Calculation of load.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Make bill of quantity projects.

LIST OF TOOLS AND EQUIPMENT

Sr. No.	Description
1.	MS office
2.	PC
3.	Paper
4.	Printer
5.	Rivit

0720-M&P-18. Develop Basic NC code for milling machine

Overview:

This competency standard is designed to provide skills and knowledge to write basic CNC program for Milling Machine Operation further that you must achieve to set-up machine, work piece, cutting tools and perform basic CNC milling machine operations.

Competency Units	Performance Criteria
1. Determine job requirements	<p>P1. Interpreted <i>Drawings</i> to produce program according to specifications</p> <p>P2. determine sequence of operation to produce component according to specification</p> <p>P3. Select Cutting tools according to the requirements of the product.</p> <p>P4. Calculate Cutting speed and feed rate based on cutting tool and material.</p> <p>P5. Process / adjustment sheets are filled up with relevant machine, tool and raw material data.</p>
2. Write basic CNC milling Machine program.	<p>P1. Calculate Coordinates for simple tool path or basic machining functions based on part or product to be produced.</p> <p>P2. Develop standard Program for CNC Milling operations, in accordance with standard operating procedures.</p>
3. Edit basic CNC milling Machine programs.	<p>P1. Simulate and edit Program according to standard operating procedures.</p> <p>P2. Save Program according to standard operating procedures.</p> <p>P3. Import Program to the machine according to standard operating procedures.</p>
4. Perform Basic CNC milling Machine Operations	<p>P1. Set-up CNC milling machine, work-piece and cutting tools</p> <p>P2. Mount Work piece in accordance with standard operating procedures.</p> <p>P3. Perform Basic CNC milling operations to produce component as programmed.</p> <p>P4. Perform Corrective measures/adjustments according to the requirement (if necessary).</p> <p>P5. Personal protective devices are used in accordance with occupational health and safety (OHS) requirements.</p> <p>P6. Check and measure work pieces according to the Job.</p> <p>P7. Defective work pieces are marked, recorded and reported for proper action.</p>

Knowledge & Understanding

This competency standard will provide knowledge related to:

- **Drawing interpretation**
 - Standard drawing scales, symbols and abbreviations

- Orthographic and isometric drawings
- Assembly and detailed drawings
- interpreting tolerances
- Geometrical Tolerances (form and position)
- Surface condition (surface finish/texture)
- limits and fits
- shop mathematics
- Four fundamental operation
- Fractions and decimals
- Percentages and ratios
- Conversion of units (English to metric)
- Pythagorean theorem
- Basic trigonometric function
- Materials and related science
- Classification and mechanical properties of engineering materials
- Milling machine operations
- Calculation of cutting speed, rpm, feed rate
- Classification/selection of cutting tools and tool geometry
- tool offset
- Milling operation processes
- **Shop safety practices**
 - Safe working habits
 - Identification of hazardous areas
 - Protective clothing and devices
 - Safe handling of tools, equipment and materials
 - housekeeping
 - First-aid
 - Fire extinguishers
- **Measurements**
 - Linear measuring tools (vernier, micrometer)
 - Angular measuring tools
 - Geometrical tolerances checking tools
 - Surface finish measuring instrument

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Determined job requirements
- write basic CNC milling machine program
- edited basic CNC milling machine program
- simulate CNC program
- Performed work piece set-up

- Performed trial cut on work piece

List of Tools and Equipment

Sr.No.	Description
1.	Tool pre - setting device (optional)
2.	Dial indicator
3.	Dial test indicator
4.	Gauges (go-no go, pitch, plug, radius, etc.)
5.	Coordinate measuring machine (CMM) (optional)
6.	Bevel protractor
7.	Profile projector
8.	Surface-texture tester
9.	Surface-finish comparator
10.	Steel rule
11.	CNC Milling Machine

0720-M&P-19. Develop Basic NC code for lathe Machine

Overview:

This competency standard is designed to provide skills and knowledge to write basic CNC lathe program to drawing specifications. It details the requirements for performing simple CNC lathe programming such as facing and straight and contour turning, cutting grooves, and drilling, boring, and cutting threads.

Competency Units	Performance Criteria
1. Determine job requirements	<p>P1. Interpreted Drawings to produce program according to specifications.</p> <p>P2. Sequence of operation is determined to produce program according to specification requirements of the process.</p> <p>P3. Calculate Cutting speed and feed rate based on cutting tool and material.</p> <p>P4. Process / job / adjustment sheets are filled up with relevant machine, tool and raw material data.</p>
2. Write basic CNC lathe Machine program.	<p>P1. Calculate Coordinates for simple tool path or basic machining functions based on part or product to be produced.</p> <p>P2. Develop standard Program for CNC lathe operations, in accordance with standard operating procedures.</p>
3. Edit basic CNC lathe Machine programs.	<p>P1 Simulate and edit Program according to standard operating procedures.</p> <p>P2 Save Program according to standard operating procedures.</p> <p>P3 Import Program to the machine according to standard operating procedures.</p>
4. Perform Basic CNC Lathe Machine Operations	<p>P1. Mount Work piece in accordance with standard operating procedures.</p> <p>P2. Perform Basic CNC Lathe operationsto produce component as programmed.</p> <p>P3. Perform Corrective measures/adjustments according to the requirement (if necessary).</p> <p>P4. USE Personal protective devices are used in accordance with occupational health and safety (OHS) requirements.</p> <p>P5. Check and measure work pieces according to the Job.</p> <p>P6. Defective work pieces are marked, recorded and reported for proper action.</p>

Knowledge & Understanding

This competency standard will provide knowledge related to:

- Drawing interpretation
- Standard drawing scales, symbols and abbreviations
- Orthographic and isometric drawings
- Assembly and detailed drawings
- Interpreting tolerances
- Geometrical Tolerances (form and position)
- Surface condition (surface finish/texture)
- limits and fits
- Machine reference point
- Job reference point
- Shop safety practices
- Safe working habits
- Identification of hazardous areas
- Protective clothing and devices
- Safe handling of tools, equipment and materials
- Housekeeping
- First-aid
- Fire extinguishers
- Measurements
- Linear measuring tools (Vernier, micrometer)
- Angle measuring tools
- Geometrical tolerances checking tools
- Surface finish measuring instrument
- **Material**
 - Cutting tools used in CNC lathe operations include:
 - External and internal cutting tools
 - Grooving tools
 - Drilling tools
 - Tapping tools
 - Threading tools
 - Parting-off tools

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Determined job requirements
- calculate coordinates
- write basic CNC lathe machine program
- edited basic CNC lathe machine programs
- simulate CNC program
- Performed work piece set-up
- Performed trial cut on work piece
- perform machining operation

List of Tools and Equipment

Sr.No.	Description
1.	Tool pre - setting device (optional)
2.	Dial indicator
3.	Dial test indicator
4.	Gauges (go-no go, pitch, plug, radius, etc.)
5.	Coordinate measuring machine (CMM) (optional)
6.	Bevel protractor
7.	Profile projector
8.	Surface-texture tester
9.	Surface-finish comparator
10.	Steel rule

0720-M&P-20. Design a basic project using BIM Technology

Overview:

This competency standard is designed to provide skills and knowledge to design project you will be able to specialize in residential projects, including new buildings, heritage restorations and additions or renovations; or you may also undertake commercial and industrial projects, such as factories, motels, offices, restaurants, retail or service outlets and warehouses.

Competency Units	Performance Criteria
1. Produce Communication	<p>P1. Listen to and communicate clearly with colleagues, suppliers and contractors</p> <p>P2. Participate in meetings with clients, contractors and other professionals.</p> <p>P3. Explain compliance requirements to clients</p> <p>P4. Write letters and reports to formalize agreements or clarify project information</p> <p>P5. Initiate and run meetings with lead contractor and other service contractors</p> <p>P6. Use industry-specific definitions, language symbols and terminology</p> <p>P7. Negotiate changes to designs with clients and planners.</p>
2. Build Teamwork	<p>P1. Develop constructive and cooperative working relationships with project team members, colleagues, suppliers and clients as per the job requirement.</p> <p>P2. Plan and coordinate with others to work and plan to complete tasks as per the requirement.</p>
3. Apply Problem solving techniques	<p>P1. Coordinate input of expert advice as per the requirement of the task.</p> <p>P2. Develop innovative and affordable sustainable design solutions in the workplace environment.</p> <p>P3. Maintain effective relationships with industry professionals</p>
4. Build Initiative and enterprise	<p>P1. Conduct cost-benefit analysis of design options as per the specification</p> <p>P2. Negotiate solutions to design conflicts in accordance to the job requirement</p> <p>P3. Propose creative design solutions to issues arising on site</p>
5. Planning and organizing	<p>P1. Analyse and interpret complex technical compliance requirements and apply these to different project</p> <p>P2. Devise and negotiate solutions to planning and building permit issues</p> <p>P3. Conduct cost-benefit analysis of design options</p> <p>P4. Perform complex calculations, such as structural requirements and load effects of force and movement on structural elements of buildings</p>

	P5. Identify site risks and building constraints, and produce design solutions
6. Apply Self-management	<p>P1. Produce aesthetic, cost-effective, compliant and buildable designs within given timeframes</p> <p>P2. Develop personal methodologies for ensuring project quality and for incorporating process improvements</p> <p>P3. Manage detailed input to concurrent design projects at different stages of the process and with diverse sets of regulatory requirements</p> <p>P4. Integrate safe building practices into the design of a building</p> <p>P5. Implement energy conservation strategies and cost saving practices</p>
7. Develop Building Design	<p>P1. Apply structural principles and construction technology to the design of a built form</p> <p>P2. plan the building design</p> <p>P3. set up systems and checklists for ensuring a methodical approach to design projects</p> <p>P4. Gather documentation required for design projects, including plans, specifications, drawings, legislation, codes and standards</p>
8. Implement Design using Technology	<p>P1. Read and interpret drawings, including architectural, structural, mechanical, hydraulic and electrical drawings</p> <p>P2. Interpret and Interact manuals and marketing information about new technologies, products and systems</p> <p>P3. Use computer software to produce building designs, manage project participation and conduct general personal business administration</p> <p>P4. Use relevant tools and equipment, such as measuring and surveying tools and calculators</p>

Knowledge & Understanding

This competency standard will provide knowledge related to:

- Types of Communication
- 7 Cs
- Manual Drawing Concepts
- Designing Concepts
- 2D, 3D drawing concepts
- Detail drawing
- Entrepreneurship
- Shop safety practices
 - Safe working habits

- Identification of hazardous areas
- Protective clothing and devices
- Safe handling of tools, equipment and materials
- housekeeping
- First-aid
- Fire extinguishers
- Measurements
 - Survey techniques
 - Linear measuring tools
 - Angular measuring tools
 - Geometrical tolerances checking tools
 - Surface finish measuring instrument

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Explain compliance requirements to clients
- Write letters and reports to formalize agreements or clarify project information
- Initiate and run meetings with lead contractor and other service contractors
- Plan and coordinate with others to work and plan to complete tasks as per the requirement
- Maintain effective relationships with industry professionals
- Conduct cost-benefit analysis of design options as per the specification
- Perform complex calculations, such as structural requirements and load effects of force and movement on structural elements of buildings
- Develop personal methodologies for ensuring project quality and for incorporating process improvements
- Gather documentation required for design projects, including plans, specifications, drawings, legislation, codes and standards
- Use computer software to produce building designs, manage project participation and conduct general personal business administration

0720-M&P-21. Develop Project Management Life Cycle

Overview:

This competency standard covers the skills and knowledge required to perform operations for initiation of project, support project planning and design processes, assist with project control and execution Assist with project finalization-closure.

Competency Unit	Performance Criteria
1. Perform operations for initiation of project.	P1 Prepare documents for project. P2 Establish relationship between the project and broader organizational strategies and goals P3 Assist in negotiating and documenting project objectives, outcomes and benefits P4 Assist in establishing the project governance structure-Induct requisite staff. P5 Assist in drafting a project charter for approval-feasibility report. P6 Prepare conditions applicable for project. P7 Open project office.
2. Support project planning and design processes	P1 Support breakdown of project objectives into achievable project deliverables P2 Assist in identifying project stages, and key requirements for stage completion-resources, budget, standards, and communication. P3 Identify project milestones and map clearly against time and objectives P4 Assist in consolidating associated plans and baselines in project management plan P5 Support negotiation with relevant stakeholders and project authority to gain approval of project plan
3. Assist with project control and execution	P1 Maintain and update records against project deliverables and plans at required intervals P2 Prepare status reports on project progress and identified issues P3 Assist with undertaking an impact analysis of proposed changes to the project P4 Maintain relevant project logs and registers accurately and regularly to assist with project audit P5 Update associated plans to reflect project progress against baselines and approved changes
4. Assist with project finalization-closure.	P1 Assist with project finalization activities where required P2 Prepare project products and associated documentation for handover to client P3 Assist in completing financial, legal and contractual obligations where required

Knowledge and understanding

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

- Explain the objectives and functions of project management
- Explain the different stages and activities involved in construction projects i.e. planning stage, designing stage, tendering stage and execution stage.
- State the types of civil engineering projects
- State the classification of works -original, major, minor & petty work, annual repair and special repair works.
- List the parties/persons involved in a construction project- scope of duties & responsibilities of construction team
- Explain the importance and role of each member of construction team
- Explain project management life cycle i.e. project initiating, planning, execution and project closer.
- Explain the organizations i.e. line staff, direct and functional organization, their features, merits and demerits giving merits and demerits of each
- List the engineering departments of government
- Draw organizational chart of C&W department Irrigation & power department, public Health Engineering department
- List the duties of different officers of works departments
- State the power of sanction of various officers of works departments
- Explain the classes of establishments in works department
- State Essential qualities of project Manager

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Perform operations for initiation of project.
- Support project planning and design processes
- Assist with project control and execution
- Assist with project finalization-closure.

Tools & Instruments

Sr. No.	Description (Instruments)
1	Calculator
2	Ruler

3	Pencil
4	Drawing lab equipment's

0720-M&P-22. Develop Preliminary Project Plan

Overview:

This competency standard covers the skills and knowledge required to prepare flow chart for tendering process, prepare tender documents, tender notice and collect proposals.

Competency Unit	Performance Criteria
1. Perform Survey of Area	P1. Perform reconnaissance survey of area for project. P2. Perform topographic survey of area for project. P3. Prepare map of area for project.
2. Allocate fund & select site of project	P1. Prepare rough cost estimate. P2. Get Administrative approval of project. P3. Mark options on the prepared map. P4. Select most suitable and economic site.
3. Design the project features.	P1. Perform Detailed Survey. P2. Prepare structural design of components of project. P3. Prepare geometric design / drawings of project. P4. Prepare working drawings of project.
4. Prepare detailed estimate of project- fund allocation.	P1. Work out quantities of items of work. P2. Prepare cost estimate. P3. Get technical sanction from the authority.
5. Conduct feasibility study for execution of project.	P1. Draft construction and system feasibility-resources for project. P2. Identify budget allocation and earning from project- economy. P3. Identify social benefits from the project- operational. P4. Estimate quantity of work, time, and available resources for project. P5. Decide the feasibility and prepare feasibility report of project.

Knowledge and understanding

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

- Explain the importance of preliminary planning
- Explain Pre-feasibility study.
- Explain Types of feasibility study.
- Explain Steps involved in feasibility study.
- Explain difference between feasibility report and project report
- Explain the data to be collected and aspects to be considered in feasibility report
- Explain aspects to be considered during preparation of project report

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Prepared flow chart for tendering process

Tools and Equipment's

Sr. No.	Description (Instruments)
1	Calculator
2	Ruler
3	Pencil

0720-M&P-23. Develop Project Plan

Overview:

This competency standard covers the skills and knowledge required to specify the individual activities, determine the sequence of those activities, draw a network diagram, estimate the completion time for each activity, level the resources, apply constraints, identify the critical path (longest path through the network), update the CPM diagram as the project progresses.

Competency Unit	Performance Criteria
1. Specify the individual activities.	<p>P1. Collect data from estimate of project.</p> <p>P2. Identify time dependency of activities- Dummy activities.</p> <p>P3. Divide the work into smaller parts.</p> <p>P4. Define the activities depending on resources.</p> <p>P5. Prepare the list of activities along with normal duration</p>
2. Determine the sequence of those activities.	<p>P1. Identify the activities project.</p> <p>P2. Find out predecessor and successor of each activity</p> <p>P3. Arrange them in sequence.</p>
3. Draw a network diagram.	<p>P1. Represent each activity with arc/ line with an arrow.</p> <p>P2. Draw ellipse/ circles at start and end of activities.</p> <p>P3. Observe the direction of arrows.</p>
4. Estimate the completion time for each activity.	<p>P1. Examine the resources for each activity.</p> <p>P2. Estimate the workability of workforce</p> <p>P3. Examine the productivity of machinery.</p> <p>P4. Determine the activities normal duration.</p> <p>P5. Write down time required to complete each activity.</p>
5. Identify the critical path (longest path through the network)	<p>P1. Perform forward pass by formula at each project activities.</p> <p>P2. Write early start time and early finish time for each activity.</p> <p>P3. Perform backward pass by formula at each project activities.</p> <p>P4. Write late finish time and late start time for each activity.</p> <p>P5. Level the resources of project.</p> <p>P6. Apply constraints due to resources, time, environment, and season.</p> <p>P7. Calculate float/ slack time for each activity.</p> <p>P8. Decide the critical path of construction project- activities with zero float/ slack time.</p> <p>P9. Calculate the duration of project for completion.</p>
6. Expedite/ crash progress of work	<p>P1. Enhance workforce force and machinery for activities.</p> <p>P2. Enhance daily working hours.</p>

	P3. Assess the impact of each on cost. P4. Calculate critical durations for activities. P5. Calculate time for completion of crash programming.
7. Update the CPM diagram as the project progresses.	P6. Record actual time duration during work. P7. Assess the actual cost.

Knowledge and understanding

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

- State the objectives of scheduling
- Break down the constructions work in to activities
- Explain the procedure of making schedule i.e. sequencing and time computation of each activity
- State the need for material, equipment's and Labour schedule
- Explain methods of procurement of Labour, materials and equipment's
- Plan by bar chart-time and progress chart Gantt Chart
- Prepare bar chart and explain its limitation
- Explain the advantages of project planning by network analysis (only with critical path method)
- Plan and draw C.P.M. network for a project
- Calculate network time, critical path, free float and total float
- Prepare work progress charts.
- Draw progress network/ charts for a project
- Review of network and crash programming
- Under take Resource Scheduling and levelling.
- Explain characteristics, operations and safety of construction machinery
- Explain cost of owning and operating machinery
- List main factors in selection of machinery
- Describe productivity of different machinery

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Network diagram showing critical path.
- Levelling of resources.
- Updated Network diagram showing critical path.

Tools and Equipment

Sr. No.	Description (Instruments)
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1	Calculator
2	Ruler
3	Pencil
4	Drawing lab equipment's

0720-M&P-24. Perform Basic operation in Primavera P6

Overview:

This competency standard covers the skills and knowledge required to Load Primavera Software, Unload Primavera Software, Recognize Toolbars, Customize P6 Screen and Display Gantt Chart.

Competency Units	Performance Criteria
1. Load & unload primavera P6 Software.	P1 Locate P6 icon & double click on it P2 Exit from software by menu/ close button/ short key.
2. Prepare interface of software	P1 Identify parts of application window. P2 Identify parts of working window.
3. Customize P6 Screen Layout	P1 Identify the 'Layout Options Bar' on the top in Activities category P2 Add required number of columns to the layout. P3 Add created columns in existing layout. P4 Move columns to the left and right for adjustment. P5 Change the order of columns as per requirement.
4. Display Gantt Chart	P1 Open Gantt chart window. P2 Select 'Layout Options Bar' 'Group and Sort...' P3 Select 'Group by' dropdown list 'WBS' P4 Select other required parameters. P5 Use of snip tool for screen shot.

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 the knowledge of:

- Describe the use of Primavera Software
- Describe Loading / Unloading procedure of P6 software
- Describe the interface of Primavera P6.
- Describe the benefits of true Enterprise Project Management systems
- Describe the names and function of all Views, Layouts, Toolbars and Icons in P6
- Describe the process of Customizing Layouts
- Describe process of taking screen shot.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Physical performance to Customized screen layout.
- Customized screen layout screen shot.

Tools & Equipment

- Computer with mouse & keyboard
- P6 Software installed

0720-M&P-25.Perform road Project Activities Scheduling in Primavera P6

Overview:

This competency standard covers the skills and knowledge required to Add Project, Create WBS, Create Activities, Create Relationships, and Create Schedule.

Competency Units	Performance Criteria
<p>1. Add Project in Primavera</p>	<p>P1 Open 'Projects' screen P2 Select the EPS for the new project P3 Enter Project ID and Project Name P4 Enter Planned Start Date for the project and target deadline in 'Must Finish by' P5 Select the 'Responsible Manager' P6 Select 'Assignment rate Type' P7 Check 'no do not run project architecture' P8 Open Projects Screen and click on the newly created project P9 Open 'Notebook' tab in the opened 'Project Detail' window 'Add' Select the type of note to be added P10 Open 'Dates' tab Add relevant dates</p>
<p>2. Create WBS of project in Primavera.</p>	<p>P1 Click 'WBS' tab on the Directory Bar on the left to open WBS Window P2 Click 'Add' from the command bar on the right P3 Assign a 'Code' and 'Name' to the newly added WBS Element P4 Add more WBS elements P5 Take a WBS element to a higher hierarchy level by clicking on the LEFT arrow key on the command bar P6 Take a WBS element to a lower hierarchy level by clicking on the RIGHT arrow key on the command bar P7 Move a WBS element to a higher head by clicking the UP arrow key on the command bar P8 Move a WBS element to a lower head by clicking the DOWN arrow key on the command bar P9 Create a detailed WBS</p>
<p>3. Create Activities of project in Primavera.</p>	<p>P1 Click the 'Activities' icon on the directory bar on the left to open Activities Screen P2 Click 'Add' button on the command bar on the right P3 Type activity name in the relevant box P4 Click 'Activity Type' tab of the activity P5 Select 'Start Milestone' for the first activity P6 Add expected activity duration in the 'original duration' column P7 Add activities to other WBS levels P8 Click on 'Show/Hide Activity Detail' icon on the</p>

	<p>toolbar to open Detail View</p> <p>P9 Add other parameters in the tabs shown</p>
<p>4. Create Relationships between activities of project in Primavera.</p>	<p>FROM ACTIVITY NETWORK VIEW</p> <p>P1 Click 'Activity Network' icon on the toolbar</p> <p>P2 Select a WBS Node</p> <p>P3 Select simultaneously the activities whose relationship is to be defined.</p> <p>P4 Click 'Edit' dropdown menu Click 'Link Activities' to create an automatic Start-to-Finish relationship between the two.</p> <p>FROM GANTT CHART VIEW</p> <p>P5 Click the 'Gantt Chart' icon on the toolbar</p> <p>P6 Click the Activity name from the Activity Table Window on the left</p> <p>P7 Click the 'Relationships' tab on the Activity Detail window on the bottom</p> <p>P8 In the 'Predecessors' and 'Successors' window, click 'Assign' Select relevant activity from the pop-up window.</p> <p>P9 Click the "Assign" button on the right of 'Assign Successor/Predecessor' pop-up screen Click on the Close button to exit.</p> <p>P10 Click on the cell in the 'Relationship Type' column to change the activity relationship from FS to either SS, or SF or FF, as required.</p> <p>TO VIEW ACTIVITY RELATIONS GRAPHICALLY</p> <p>P11 Click 'Relationship Lines' icon on the toolbar</p> <p>P12 Identify the relationship arrows now visible in the Gantt Chart on the right</p>
<p>5. Create Schedule of activities of project in Primavera.</p>	<p>P1 Click on the 'Schedule' icon on the Toolbar OR Press 'F9' Key</p> <p>P2 Add all the relevant parameters in the 'Schedule' pop-up window, Click 'Schedule' button on the right.</p>

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 the knowledge of:

- Define Project, its types, constraints
- Define Activity, activity types, duration and dependencies.
- Define activity relationships, constraints, float, critical path, forward & backward pass,
- Define resource and enlist its types
- Identify Gantt Chart
- Define Work Breakdown Structure
- Define Activity and its attributes,
- Enlist Types of Activities

- Define task dependent activity, resource dependent activity, start milestone activity, finish milestone activity, level of effort activity
- Describe Duration Types,
- Describe the purpose of using Activity Codes,
- Define Relationship & describe their Types
- Perform Forward and Backward Pass,

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Physical performance to Relationship assigned gantt chart.
- Relationship assigned gantt chart screen shot.

Tools & Equipment

- Computer with mouse and keyboard
- Primavera P6 software installed

0720-M&P-26.Perform road Project Resources Costing &Planning in Primavera P6

Overview:

This competency standard covers the skills and knowledge required to add Constraints, Create & Assign Calendar, Add, Assign & Analyze Resources, Add Cost and Baseline the Project.

Competency Units	Performance Criteria
1. Add constraints of activities of project in Primavera.	<p style="text-align: center;">ADDING ACTIVITY CONSTRAINTS</p> <p>P1. Select the activity</p> <p>P2. Click on the 'Status' tab in the Activity Detail Window.</p> <p>P3. In the 'Constraints' box, select Constraint</p>

	<p>types and required dates</p> <p>P4. Schedule the project</p> <p>ADDING PROJECT CONSTRAINTS</p> <p>P5. Click on the 'Projects' icon in the directory bar to open Projects Screen</p> <p>P6. Select the Project</p> <p>P7. Click on the 'Dates' tab in the Project Detail Window.</p> <p>P8. Add a 'Must Finish by' date in the Schedule Dates box.</p> <p>P9. Run Scheduler</p>
<p>2. Create Calendar for activities of project in Primavera.</p>	<p>P1. Go to 'Enterprise' menu Click 'Calendars'</p> <p>P2. Click 'Add' on the left in the 'Calendar' pop-up screen</p> <p>P3. Select the appropriate existing calendar to copy from.</p> <p>P4. Enter the name for the new calendar and press Enter</p> <p>P5. Select the created calendar and click 'Modify' on the left side</p> <p>P6. Display 'detailed work hours/day' by selecting that option on the top</p> <p>TO ASSIGN NON-WORKING/WORK</p> <p>P7. Made necessary modifications</p> <p>TO CHANGE WORKING DAYS PER WEEKING DAY</p> <p>P8. Select the required day of the week Click 'Work'/'Nonwork' as required</p> <p>P9. Click 'Workweek' on the left Select the day to be marked working/non-working Select the hours of the day to be marked Click the appropriate button ('Work'/'Network')</p>
<p>3. Assign Calendars to activities of project in Primavera.</p>	<p>P1. Add 'Calendar' column to the layout</p> <p>P2. Click Layout Options bar Click 'Show on Top' Click 'Activity Usage Spreadsheet' (OR Display Activity Usage Spreadsheet)</p> <p>P3. Double click the 'Calendar' field of the required activity</p> <p>P4. Select the required calendar from the 'Select Activity Calendar' pop-up Click 'Assign' button on the left</p> <p>OR</p> <p>P5. Go to the Activity Detail window 'General' 'Activity Calendar' Select the required Calendar.</p> <p>P6. Run Scheduler</p>
<p>4. Add Resources to activities of project in Primavera.</p>	<p>P1. Click 'Resources' icon on the Directory bar to open 'Resource Dictionary'</p>

	<p>P2. Click the Display bar 'Details' to display the 'Resource Details' window</p> <p>P3. Click 'Add' button on the right side of the screen</p> <p>P4. Add resource details in the Resource Detail tabs:-</p> <p>P5. Give Resource ID and Name in 'General' tab</p> <p>P6. Define Resource Type and Working Hours in 'Details' tab</p> <p>P7. Add "effective date", 'Max units/time' and 'Hourly Rates'</p>
5. Assign Resources of activities of project in Primavera.	<p>P1. Select the activity to which resources are to be assigned</p> <p>P2. Go to Activity Detail window 'Resources' tab 'Add Resource' Select the appropriate resource from the 'Assign Resources' pop-up window</p> <p>P3. Indicate the Primary Resource from the list of resources added.</p>
6. Add Cost of activities of project in Primavera.	<p>P1. Select the required activity</p> <p>P2. Open 'Expenses' tab in the Activity Detail window Click 'Add' Give details as required</p>
7. Analyze Resources of activities of project in Primavera.	<p>P1. Click 'Resource Usage Profile' from the toolbar to display 'Resource Usage Profile Graph'</p> <p>P2. Click on each project resource listed on the left to display their respective working hours/week graphs</p> <p>P3. Identify work hours per week, working limit and over-allocation from the bar chart on the right</p> <p>P4. Select the 'Resource' box to display only the activities involving the selected resource.</p> <p>P5. Identify overlapping activities in the Gantt Chart</p> <p>P6. Click 'Resources' button on the right to re-allocate the activity to another resource Click 'Replace Resource' button on the right Select the appropriate resource as a replacement.</p> <p>P7. Confirm the selected resource is not over-allocated as a result.</p>
8. Perform Baseline process for Project.	<p style="text-align: center;">CREATE BASELINE</p> <p>P1 Click 'Project' menu 'Maintain Baselines...' 'Add' Select 'Save a copy of the current project as a new baseline'</p> <p>P2 Give Baseline Name in the appropriate Box</p>

	<p>P3 Categorize the Baseline type by selecting the appropriate type from the 'Baseline Type' dropdown menu</p> <p style="text-align: center;">ASSIGN BASELINE</p> <p>P4 Click 'Project' menu 'Assign Baselines...'</p> <p>P5 Select the required 'Project Baseline' from the dropdown menu</p> <p style="text-align: center;">DISPLAY THE BASELINE GRAPHICALLY</p> <p>P6 Click Layout Options Bar Click 'Bars...'</p> <p>P7 Select the box before 'Project Baseline' and 'Project Baseline Milestone' in the 'Bars' window</p> <p>P8 Observe the modified bars of actual performance in the Gantt Chart and compare them to the baseline</p>
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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 the knowledge of:

- Describe Activity Constraints,
- Define work calendar, work/non-work days, working hours
- Describe Roles and Hourly Rates,
- Define Baselines and describe their use in evaluating project performance

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Road Project planned in Primavera P6- Baseline Plans, Display, Resource Usage Profile, calendars, resources

Tools & Equipment

- Computer with mouse and keyboard
- Primavera P6 software installed

0720-M&P-27.Manage construction Project in Primavera P6

Overview:

This competency standard covers the skills and knowledge required to Status the Project and mitigate the schedule resulting in monitoring of planning.

Competency Units	Performance Criteria
1. Status the Project	<p>P1. Click the 'Progress Spotlight' button in the toolbar Drag the spotlight edge in the Gantt chart to increase/decrease the spotlight timeline.</p> <p>P2. Select the required activity</p> <p>P3. Open the 'Status' tab in the Activity Display window</p> <p>P4. Check 'Started' and 'Finished' box in the 'Status' section Give appropriate dates</p> <p>P5. Click 'Expenses' tab Add Actual Activity Cost</p> <p>P6. Click 'Schedule' button on the toolbar Add 'Data Date' in the 'Current Data Date' 'Schedule'</p>
2. Mitigate the schedule	<p>P1. Identify the activities deviating the most from the project baseline</p> <p>P2. Click on that activity</p> <p>P3. Perform any/all of the following: -</p> <p>P4. Add more resources to the activity</p> <p>P5. Modify the calendar for resources working below their work/hour limit</p> <p>P6. Remove constraints causing delay to the activity</p> <p>P7. Schedule the project</p>

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 the knowledge of:

- Enlist and describe stages of project execution
- Describe project monitoring and control

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Managed Project - project progress, planned baseline, Resource levelling and describe its purpose, comparison graphically, project progress for a specified time period

Tools & Equipment

- Computer with mouse and keyboard
- Primavera P6 software installed

0720-M&P-28.Manipulate Images (Photoshop)

Overview:

This competency standard covers the skills and knowledge required to know about the computer graphics application Adobe Photoshop, its interface, workspace and navigation tools. This unit will also cover the knowledge of image editing, setting colour space, image enhancement, spraying, and animation.

Competency unit	Performance Criteria
1. Install Adobe Photoshop	P1. Locate Adobe Photoshop Package P2. Install the package P3. Validate the tool after installation
2. Format an Image in Adobe Photoshop	P1. Open the Image. P2. Select the required tool and apply on image P3. Check the image.
3. Design layers in moving objects	P1. Create layers and open image or draw object or image on layer. P2. Select all objects on a specific layer and also move object from one layer to another layer and also copy past the object on different layer P3. Duplicate specific layer and also inert new layer P4. Show or hide layers and objects. P5. Lock or unlock the object or layers. And also merge the layers.
4. Design an object	P1. Draw different shapes as required P2. Reshape the objects P3. Align the objects as required P4. Transform the objects as required P5. Save edited object
5. Design Shapes	P1. Open Adobe Photosop P2. Design shapes in coral draw using different tools like rectangle,ellipse,polygon etc P3. Design the Shapes as required P4. Save the Shapes or objects in jpg, png etc.format.

Knowledge and Understanding

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

- Photoshop interface
- Customized the workspace
- Use of pen tool
- Lasso tool
- Setting color space
- Image conversion
- Layer panel
- Filter effects
- Layers and layers merging
- Image save with different graphic extensions

Critical Evidence(s) Required

The candidates need to produce following critical evidence(s) in order to be competent in this competency standard:

- Demonstrate image flattening in Photoshop

Tools and Equipment required

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

Sr. No	Items
1.	Computer system
2.	Adobe Photoshop
3.	Printer

Digital Skills

0720-M&P-29 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
1. Use appropriate OHS office work practices	P1. Use safe work practices to ensure ergonomic, work organization, energy and resource conservation requirements are addressed P2. Use wrist rests and document holders where appropriate P3. Use monitor anti-glare and radiation reduction screens where appropriate
2. 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
3. Use digital media package	P1. Procure or create suitable data to meet requirements of the brief Manipulate data using digital media package tools P2. Ensure naming and storing of documents in appropriate file format in directories or folders
4. 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 design brief

Knowledge and Understanding

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

- Basic principles of visual design
- Functions and features of digital media packages and technologies
- Graphic design and stylistic language conventions
- OHS principles and responsibilities for ergonomics, such as work periods and breaks
- Principles of digital imaging and file formats, video and sound file formats, file management and transfer systems
- Vendor product directions in digital media hardware and software
- 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.

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.

0720-M&P-30 Perform computer operations
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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.

Competency Unit	Performance Criteria
1. Plan and prepare for task to be undertaken	<p>P1. Determine the Requirements of task as per standard operating procedures</p> <p>P2. Select Appropriate hardware and software according to task assigned and required outcome</p> <p>P3. Plane the task properly</p>
2. Input data into computer	<p>P1. Enter the Data into the computer using appropriate program/application in accordance with company procedures</p> <p>P2. Check the accuracy of information and information is saved in accordance with standard operating procedures</p> <p>P3. Input data are stored in storage media according to requirements</p> <p>P4. Perform the Work within ergonomic guidelines</p>
3. Access information using computer	<p>P1. Select the Correct program based on job requirements</p> <p>P2. Access the Program/application containing the information required according to company procedures</p>
4. Produce/output data using computer system	<p>P1. Process the entered data using appropriate software commands</p> <p>P2. Print the Data as required using computer hardware/peripheral devices in accordance with standard operating procedures</p> <p>P3. Transfer data between compatible systems using computer software, hardware/ peripheral devices in accordance with standard operating procedures</p>

Knowledge and Understanding

Candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of Basic ergonomics of keyboard and computer use

- Main types of computers and basic features of different operating systems
- Main parts of a computer
- Storage devices and basic categories of memory
- Relevant types of software

- General security
- Viruses
- OH & S principles and responsibilities
- Calculating computer capacity

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

- 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
- Use appropriate devices and procedures to transfer files/data accurately
- Maintained computer system

Tools and Equipment's

N/A

0720-M&P-31 Create User Documentation

Overview:

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

Unit of Competency	Performance Criteria
1. Determine documentation standards and requirements	P1. Determine documentation requirements P2. Investigate documentation and industry standards for requirements and determine appropriate application to user documentation P3. Design documentation templates using appropriate software and obtain approval from appropriate person
2. Produce user documentation	P1. Conduct a review of the subject system, program, network or application in order to understand its functionality P2. Gather existing technical, design or user specifications and supporting documentation P3. Create user documentation based on template to record the operation of the subject system, program, network or application
3. Review and obtain sign-off	P1. Submit user documentation to target audience for review P2. Gather and analyze feedback P3. Make changes to user documentation P4. Submit user documentation to appropriate person for approval

Knowledge and understanding

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

- Content features, including clarity and readability
- Document design, web design and usability
- Functions and features of templates and style guides
- Instructional design principles

Critical Evidence(s) Required

The candidates need to produce following critical evidence(s) to be competent in this competency standard

- Document that Meets business requirements
- Document that Is clear to the target audience

0720-M&P-32 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	<p>P1. Consult with client to identify documentation requirements Interpret and evaluate documentation requirements and confirm details with client</p> <p>P2. Investigate industry and documentation standards for requirements</p> <p>P3. Define and document the scope of work to be produced</p> <p>P4. Consult with client to validate and confirm the scope of work</p>
2. Design documentation	<p>P1. identify information requirements with reference to layout and document structure</p> <p>P2. Create document templates and style guides consistent with information requirements</p> <p>P3. Conduct a review of the system in order to understand its functionality</p> <p>P4. Extract content that meets information requirements according to copyright restrictions</p> <p>P5. Develop the structure of the technical documentation giving focus to the flow of information, style, tone and content format</p> <p>P6. Validate the technical documentation structure with the client</p>
3. Develop documentation	<p>P1. Write technical documentation based on the template and scope of work using the information gathered</p> <p>P2. Translate technical terminology into plain English where appropriate</p> <p>P3. Apply content format and style according to documentation standards and templates</p>
4. Evaluate and edit documentation	<p>P1. Submit technical documentation to appropriate person for review</p> <p>P2. Gather and analyze feedback</p> <p>P3. Incorporate alterations into the technical documentation</p> <p>P4. Edit the technical documentation for technical and grammatical accuracy</p>
5. Prepare documentation for publication	<p>P1. Check that the completed technical documentation meets client requirements and scope of work</p> <p>P2. Submit the technical documentation to</p>

appropriate person for approval

P3. Prepare the technical documentation for publication and distribution using appropriate channels

Knowledge and understanding

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

- Content features, such as clarity and readability
- Document design, web design and usability
- Functions and features of templates and style guides
- Instructional design principles
- Organizational policies, procedures and standards that cover document design.

Critical Evidence(s) Required

The candidates need to produce following critical evidence(s) to be competent in this competency standard:

- 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.

0720-M&P-33 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	<p>P1. Determine the information that the database is required to hold</p> <p>P2. Develop a written requirement report for the functionality of the database</p> <p>P3. Complete the documentation, and submit it to the appropriate person for approval</p>
2. Use data modeling to design the database to suit requirements	<p>P1. Design an entity-relationship (ER) diagram to model the relationships between the entities and the attributes that the database will hold</p> <p>P2. Develop primary and foreign keys to link the entities</p> <p>P3. Develop a data dictionary</p> <p>P4. Complete the documentation, and submit it to the appropriate person for approval</p>
3. Create a database on a web or database server	<p>P1. Use the appropriate language on a web or database server to create one or more databases</p> <p>P2. Use the appropriate language on a web or database server to create tables</p> <p>P3. Populate the database fields</p>
4. Test the database and debug	<p>P1. Test the database on the web or database server</p> <p>P2. Ensure that the information represented matches the requirements</p>

Knowledge and understanding

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

- Outline the principles of open platforms, including browsers and databases
- List the processes associated with the creation of entities, attributes, and I populating fields, using both software solutions and script- based input
- Describe data-modeling techniques to design a database
- Outline the steps in database design, modeling and implementation
- Describe the internet operation related to web servers and clients
- Identify the naming conventions appropriate to database design\ identify security restrictions on servers, incorporating some theoretical concepts
- Describe best practice communication, and accessibility, for audiences with special needs.

Critical Evidence(s) Required

The candidates need to produce following critical evidence(s) to be competent in this competency standard:

- Extract required data fields from a relation.

Tools and Equipment required

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

Sr. No	Items
1.	Computer system
2.	Database Management System

0720-M&P-34 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	<p>P1. Explain characteristics of the term social media</p> <p>P2. Identify different types of social-media tools and applications</p> <p>P3. Illustrate some of the issues associated with the use of social media tools and applications</p>
2. Compare different types of social media tools and applications	<p>P1. Select one social media type for review</p> <p>P2. Review most popular tools and applications within that social media type</p> <p>P3. Itemize benefits across a range of the most popular tools and applications</p> <p>P4. Select most appropriate social media tool or application</p>
3. Set up and use popular social media tools and applications	<p>P1. Identify social media tools and applications for possible implementation</p> <p>P2. Initiate preferred social media tools and applications for use</p> <p>P3. Establish social media interface using text and file content initiate social networking interaction</p> <p>P4. Test and evaluate tools and applications for ease of use</p> <p>P5. Present findings</p>

Knowledge and understanding

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

- Basic technical terminology in relation to social networking and social media applications and tools
- Basic knowledge of uploading images, text files, pdf files, audio files, video files and link associated files
- Features and functions of social media applications
- Import and export software functions
- Linking documents
- OHS principles and responsibilities for ergonomics, including work periods and breaks
- Tagging to facilitate collaborative folksonomy
- Social media applications and procedures for connecting to social networking sites
- Use of input and output devices
- 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.

0720-M&P-35 SCM (Supply Chain Management)

Overview:

This competency unit covers to develop efficient E-Marketing strategies in accordance with the Vision and Mission statement of the organization driven by Electronic means.

Unit of Competency	Performance Criteria
1. SCM (Supply Chain Management)	<p>P1. Identity potential Suppliers</p> <p>P2. Select the appropriate supplier</p> <p>P3. Place order as per requirement/inventory</p> <p>P4. Inspect received order</p> <p>P5. Maintain Inventory as per Inventory Control / store keeping techniques</p> <p>P6. Identity different available transportation mode</p> <p>P7. Identify steps of reverse SCM i-e from consumer to organization</p>

Knowledge and Understanding

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

- Elaborate knowledge of procurement Cycle (Launch of RFP/RFQ, Tender, Bidding, Comparative Statement, Award of Contract, Maintenance)
- Explain different techniques to manage
- Explain product delivery and their traceability
- Knowledge of Incorporation of Outsourcing in logistics.
- Information about electronic Data Interchange methodologies and format

Critical Evidence(s) Required

A candidate who demonstrates competency in this unit must be able to provide skills of implementing E-Marketing strategies

0720-M&P-36 Install Office Application Suit

Overview:

This competency intends to provide knowledge and skills on preparation of MS Office suit installations and up-gradation. It also deals with MS Office suit component addition, repair, and removal.

Competency Units	Performance Criteria
1. Install software applications	<p>P1. Ensure that necessary precautions have been taken before installing MS Office suit</p> <p>P2. Register a software with the help of its key</p> <p>P3. Install a software application carefully as per given instructional manual</p> <p>P4. Select required MS Office component for customized / full installation</p> <p>P5. Select appropriate location for installation of the components</p> <p>P6. Finish installation</p>
2. Up grade the MS Office suit	<p>P1. Select the upgradation package of the MS Office (Offline / Online)</p> <p>P2. Run the selected package</p> <p>P3. Perform the required actions i.e. restart to apply the changes</p>
3. Add or remove MS Office suit components	<p>P1. Select the office suit package</p> <p>P2. Run the selected office suit</p> <p>P3. Select the add / remove option to perform the task</p> <p>P4. Restart the computer to ensure add/ remove task</p>

Knowledge and Understanding

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

- Understand different software applications.
- Explain the procedure to install a software application as per given instructional manual.

Critical Evidence(s) Required

The candidates need to produce following critical evidence(s) in order to be competent in this competency standard:

- Perform MS Office suit installation compatibility

Tools and Equipment required

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

Sr. No	Items
1.	Computer System
2.	MS Office Suit Installation Package

0720-M&P-37 Format Document in MS Word

Overview:

This basic module intends to provide knowledge and skills on preparation of word documents. It also deals with basic interface, tools/menu management, safety aspects, and word processing software handling techniques.

Competency Units	Performance Criteria
1. Install software applications	<p>P1. Ensure that necessary precautions have been taken before installing any software application</p> <p>P2. Register a software with the help of key</p> <p>P3. Install a software application carefully as per given instructional manual</p>
2. Type a Word Document	<p>P1. Open a new word file</p> <p>P2. Give a name and location to save the word file</p> <p>P3. Type in a MS word file with the help of any suitable typing tutor</p> <p>P4. Ensure that typed document is spelling error free</p> <p>P5. Develop the typing speed at least 20 words per minute</p> <p>P6. Open and use some typing tutor programs</p> <p>P7. Use systematic keyboard / finger setting preferably with both hands</p> <p>P8. Perform some online typing test and to make sure that required typing outcome has been achieved through online evaluation</p> <p>P9. Make typing in MS word</p>
3. Set-up page in a Word Document	<p>P1. Apply the page margins on the word document</p> <p>P2. Set a suitable orientation</p> <p>P3. Set the suitable size of the page</p> <p>P4. Insert some columns in the word file where appropriate</p> <p>P5. Perform Page set-up in the given any word file document</p> <p>P6. Ensure new page is added to be edited/worked on.</p>
4. Edit Word Document	<p>P1. Edit a typed word document</p> <p>P2. Insert a new word or delete a word in the MS word file</p> <p>P3. Insert a new paragraph or delete a paragraph in the MS word file</p> <p>P4. Add or delete a page or group of paragraph through selection</p> <p>P5. Check the spellings in the word file through available dictionary</p> <p>P6. Edit a MS document is as per the given specification / criteria / demand</p>
5. Add image in the MS word document	<p>P1. Open the MS word document</p> <p>P2. Select image insert option</p> <p>P3. Select the required image</p> <p>P4. Add caption to the image</p> <p>P5. Adjust image as per requirement</p>

6. Insert header , footer in MS word document	P1. Open the MS word document P2. Insert header / footer as per requirement P3. Insert page number in footer P4. Insert document title in header P5. Close header and footer veiw
7. Apply basic formatting to MS word document	P1. Add bullets and number to list in MS word document P2. Apply indentation P3. Apply line spacing as per requirement in MS word document P4. Apply super scripts and sub scripts P5. Insert text box P6. Apply word art P7. Apply font setting
8.Insert table	P1. Insert table P2. Add/Delete Row P3. Add/Delete Column

Knowledge and Understanding

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

- Define header and footer
- Explain indentation
- Explain Font Setting
- Explain Table setting

Critical Evidence(s) Required

The candidates need to produce following critical evidence(s) in order to be competent in this competency standard:

- Produce a word documents which contains the information in form of text, image, table.

Tools and Equipment required

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

Sr. No	Items
1.	Computer System
2.	MS Office Suite

0720-M&P-38 Operate Spreadsheet Applications

Overview:

This competency intends to provide knowledge and skills on preparation of spreadsheets. It also deals with basic interface, tools/menu management and spreadsheets handling techniques.

Competency Unit	Performance Criteria
1. Create spreadsheets	P1. Open the spreadsheet application, create spreadsheet files and enter numbers, text and symbols into cells according to information requirements

	<p>P2. Enter simple formulas and functions using cell referencing when required</p> <p>P3. Correct formulas when error messages occur</p> <p>P4. Use a range of common tools during spreadsheet development</p> <p>P5. Edit columns and rows within the spreadsheet</p> <p>P6. Use the auto-fill function to increment data where required</p> <p>P7. Save the spreadsheet to a folder on a storage device</p>
<p>2. Customize basic settings</p>	<p>P1. Adjust page layout to meet user requirements or special needs</p> <p>P2. Open and view different toolbars</p> <p>P3. Change font settings so they are appropriate for the document purpose</p> <p>P4. Change alignment options and line spacing according to spreadsheet formatting features</p> <p>P5. Format cell to display different styles as required</p> <p>P6. Modify margin sizes to suit the purpose of the spreadsheets</p> <p>P7. View multiple spreadsheets concurrently</p>
<p>3. Format spreadsheet</p>	<p>P1. Use formatting features as required</p> <p>P2. Copy selected formatting features from another cell in the spreadsheet or from another active spreadsheet</p> <p>P3. Use formatting tools as required within the spreadsheet</p> <p>P4. Align information in a selected cell as required</p> <p>P5. Insert headers and footers using formatting features</p> <p>P6. Save spreadsheet as another file type</p> <p>P7. Save to storage device and close spreadsheet</p>
<p>4. Incorporate object and chart in spreadsheet</p>	<p>P1. Import an object into an active spreadsheet</p> <p>P2. Manipulate imported object by using formatting features</p> <p>P3. Create a chart using selected data in the</p>

	spreadsheet
	P4. Display selected data in a different chart
	P5. Modify chart using formatting features
5. Print spreadsheet	P1. Preview spreadsheet in print preview mode
	P2. Select basic printer options
	P3. Print spreadsheet or selected part of spreadsheet
	P4. Submit the spreadsheet to appropriate person for approval or feedback

Knowledge and Understanding

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

- Explain how to open a new or saved workbook in MS Excel.
- Explain how to save file in MS Excel.
- Explain how to apply the page margins in MS Excel.
- Define page set-up for MS Excel.
- Define Basic Formulas.
- Explain editing, Add or delete data in MS Excel.

Critical Evidence(s) Required

The candidates need to produce following critical evidence(s) in order to be competent in this competency standard:

- Create spreadsheets
- Customize basic settings
- Format spreadsheets
- Create basic formulas
- Insert objects and charts in spreadsheets
- Save and print spreadsheets.

Tools and Equipment required

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

Sr. No	Items
1.	Computer System
2.	MS Office Suite

0720-M&P-39 Create Presentation in MS PowerPoint

Overview:

This competency intends to provide knowledge and skills on preparation of presentation. It also deals with basic interface, tools/menu management and presentation handling techniques

Unit of Competency	Performance Criteria
1. Create presentations	<p>P1. Open presentation package and create a simple design for a presentation according to organizational requirements</p> <p>P2. Open blank presentation and add text and graphics</p> <p>P3. Apply existing styles within a presentation</p> <p>P4. Use presentation template and slides to create a presentation</p> <p>P5. Use various tools to improve the look of the presentation</p> <p>P6. Save presentation to the appropriate storage device and folder</p>
2. Customize basic settings	<p>P1. Adjust display to meet user requirements</p> <p>P2. Open and view different toolbars to view options</p> <p>P3. Ensure font settings are appropriate for the presentation purpose</p> <p>P4. View multiple slides at once</p>
3. Format presentations	<p>P1. Use and incorporate organizational charts and bulleted lists, and modify as required</p> <p>P2. Add objects and manipulate to meet presentation purposes</p> <p>P3. Import objects and modify for presentation purposes</p> <p>P4. Modify slide layout, including text and colors, to meet presentation requirements</p> <p>P5. Use formatting tools as required within the presentation</p> <p>P6. Duplicate slides within and across a presentation</p> <p>P7. Reorder sequence of slides and delete slides for presentation purposes</p> <p>P8. Save presentation in another format</p> <p>P9. Save to storage device and close presentation</p>
4. Add slide show effects	<p>P1. Incorporate pre-set animation and multimedia effects into presentation as required to enhance the presentation</p> <p>P2. Add slide transition effects to presentation to ensure smooth progression through the presentation</p> <p>P3. Test presentation for overall effect</p> <p>P4. Use onscreen navigation tools to start and stop slide show or move between different slides as required</p>
5. Print presentation and notes	<p>P1. Select appropriate print format for presentation</p> <p>P2. Select preferred slide orientation</p>

- P3.** Add notes and slide numbers
- P4.** Preview slides and run spell check before presentation
- P5.** Print selected slides and submit presentation to appropriate person for feedback

Knowledge and understanding

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

- List basic technical terminology to read help files and prompts
- Outline the different types of:
 - Formal and informal presentations
 - Audience
- Explain the effect of design and formatting on the readability and usability of presentations
- Outline presentation pitfalls
- Identify suitable presentation effects for different audiences.

Critical Evidence(s) Required

A person who demonstrates competency in this unit must be able to provide evidence of the ability to presentations 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.

0720-M&P-40 Perform writing and editing tasks

Overview:

This unit describes the skills and knowledge required to apply the conventions of plain English to writing and editing tasks of different forms. It also includes editing and proofreading techniques. It applies to individuals in various writing contexts who write and edit texts using appropriate language, style, grammar, spelling, and standard conventions for editing and proofreading.

Unit of Competency	Performance Criteria
1. Apply clear and appropriate language and style to writing and editing tasks	<p>P1. Use safe work practices including addressing ergonomic requirements when undertaking writing tasks</p> <p>P2. Use clear, concise and plain English in writing and editing tasks</p> <p>P3. Apply appropriate paragraph structure to written material to ensure clarity of meaning and ease of reading</p> <p>P4. Make clear and logical connections between sentences, paragraphs and sections</p> <p>P5. Determine and incorporate the language and style of the audience</p>
2. Apply the appropriate voice, tone and tense	<p>P1. Determine appropriate voice, tone and tense of the written materials according to audience requirements</p> <p>P2. Maintain consistent voice, tone and tense throughout written material</p>
3. Apply appropriate grammar, spelling and punctuation	<p>P1. Apply appropriate grammar conventions to a range of written contexts including use of numbers, quotations, and tables</p> <p>P2. Apply appropriate spelling and punctuation conventions in writing and editing tasks.</p>
4. Perform editing and proofreading tasks to meet requirements	<p>P1. Edit written material to ensure clear meaning through language and paragraphs, consistent voice, tone and tense</p> <p>P2. Copyedit written material by checking grammar, spelling and punctuation using standard editing conventions</p> <p>P3. Proofreading using style guides and by monitoring written material for errors</p>

Knowledge and understanding

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

- Main features of clear, concise and plain English language for written material
- Grammar, punctuation and spelling conventions that meet the task requirements
- Editing conventions used in substantive editing and copyediting of written material
- Basic software used to write and collect feedback

Critical Evidence(s) Required

A person who demonstrates competency in this unit must be able to provide evidence of the ability to perform writing and editing tasks 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:

- Write and edit at least one written material (2500-4000 words) and edit another material written by another author (2500-4000 words), of different forms (e.g. blog, journal, book) that demonstrate use of:
 - clear and concise language
 - clear and logical paragraph structures
 - appropriate voice, tone, tense and language
 - plain English grammar, spelling and punctuation
 - accepted grammar conventions for a range of written contexts including use of numbers, quotation and tables
 - standard editing conventions
- Complete editing and proofreading tasks using handwritten and digital methods
- Accurately follow a style guide where required
- Follow relevant health and safety practices for writing tasks

Entrepreneurial Skills

0720-M&P-41 Investigate Micro Business Opportunities

Overview:

This competency describes the performance outcomes, skills and knowledge required to develop business ideas, and to investigate market needs and factors affecting potential markets.

Competency Unit	Performance Criteria
1. Describe business ideas	<p>P1. Gather information for business ideas from appropriate sources</p> <p>P2. List details of business ideas and opportunities</p> <p>P3. Research alternative business ideas in light of the resources available</p> <p>P4. Research alternative business ideas in light of the resources available</p> <p>P5. Identify and research potential customer information for business ideas</p>
2. Identify market needs	<p>P1. Collect information regarding market size and potential from appropriate sources</p> <p>P2. Investigate market trends and developments to identify market needs relative to business ideas</p> <p>P3. Gather market information from primary and secondary sources to identify possible market needs in relation to business ideas</p> <p>P4. Identify new and emerging markets and document their features</p> <p>P5. Identify and organize information on expected market growth or decline and associated risk factors</p>
3. Investigate factors affecting the market	<p>P1. Identify projected changes in population, economic activity and the labor force that may affect business ideas</p> <p>P2. Identify movements in prices and projected changes in availability of resources</p> <p>P3. Review trends and developments and identify their potential impact on business ideas</p>
4. Describe business ideas	<p>P1. Gather information for business ideas from appropriate sources</p> <p>P2. List details of business ideas and opportunities</p> <p>P3. Research alternative business ideas in light of the resources available</p> <p>P4. Research alternative business ideas in light of the resources available</p> <p>P5. Identify and research potential customer information for business ideas</p> <p>P6. Identify and organize information on expected market growth or decline and associated risk factors</p>
5. Identify market needs	<p>P1. Collect information regarding market size and potential from appropriate sources</p> <p>P2. Investigate market trends and developments to identify market needs relative to business ideas</p> <p>P3. Gather market information from primary and secondary sources to identify possible market needs in relation to business ideas</p>

	<p>P4. Identify ethical and cultural requirements of the market and their impact on business ideas</p> <p>P5. . Identify and organize information on expected market growth or decline and associated risk factors</p>
6. Investigate factors affecting the market	<p>P1. Identify projected changes in population, economic activity and the labour force that may affect business ideas</p> <p>P2. Identify movements in prices and projected changes in availability of resources</p> <p>P3. Review trends and developments and identify their potential impact on business ideas</p>

Knowledge and understanding

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

- Define entrepreneurship.
- Explain the concept of entrepreneurship
- Explain the various types of enterprise that exist in the community
- Identify and interpret the terms and elements involved in the concept of enterprise
- Appreciate that the advancement of individual and society in general when entrepreneurship is adopted
- Explain various motivational factors that entrepreneurs possess and utilize.
- Exhibit the skills needed to assess and evaluate a risk
- Describe the outline of small enterprise
- Describe the creativity and innovation
- Apply the techniques for developing creative abilities
- Explain the resources of business idea
- Explain the collective and creative thinking
- Explain how to generate a business idea
- Appreciate the importance of and possess techniques for identifying and assessing business opportunities.
- Identify the various entrepreneurial characteristics
- Access personal potential for becoming future entrepreneurs.
- Identify leadership qualities which are essential to the success of entrepreneurs
- Identify self- management skills and how they are important to be enterprising
- Apply a rational approach to make personal and business decisions
- Explain the steps for decision making and rating of decision making skills
- Apply the rules of negotiation for resolving business issues

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

Evidence of the following is essential:

- Thorough investigation of business opportunities and ideas
- Clearly identified products/services and customer information for each business idea
- Thorough collection and analysis of market information and associated factors relating to business ideas
- Knowledge of ethical and cultural requirements.

Instruments & Consumables

Sr. No.	Description (Instruments)
1	Calculator
2	Ruler
3	Papers and Pencil

0720-M&P-42 Develop and review a business plan.

Overview:

This competency standard covers the process of developing and reviewing business for a small business enterprise. It requires the application of knowledge and skills to determine the scope of the business plan, prepare a business plan, determine goals, trial systems, and document, monitor and review the business plan.

Competency Unit	Performance Criteria
<p>1. Determine scope of business</p>	<p>P1. Determine scope of the business plan and associated systems is determined in consultation with specialist personnel.</p> <p>P2. Access accurate information for inform business plan development</p> <p>P3. Account for and incorporate trends and seasonal variations into the business plan.</p> <p>P4. Account for strategic goals, targets and directions of the enterprise in the development of the business plan</p> <p>P5. Comply Legal obligations in developing the business plan.</p>
<p>2. Prepare business plan</p>	<p>P1. Develop operational goals and targets to meet the enterprise strategic plan.</p> <p>P2. Identify and incorporate supply chains into the business plan.</p> <p>P3. Identify risk management within the business plan.</p> <p>P4. Incorporate trial systems in order to test budgetary impact and operational potential prior to full implementation of the business plan.</p> <p>P5. Set clear and measurable indicators of operational performance to allow for realistic analysis of performance.</p>
<p>3. Document and review business plan</p>	<p>P1. Include fiscal and operational systems that enhance performance management and suit enterprise requirements.</p> <p>P2. Incorporate resource considerations the business plan.</p> <p>P3. Document accurately and clearly communicate business Plan to all relevant parties.</p>

P4. Monitor to identify strengths, weaknesses and areas for improvement performance against the business plan

P5. Make recommendations to improve the business plan and associated systems as required.

Knowledge and understanding

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

- Appreciate the importance of business plan
- Explain the process of writing a business plan
- Develop feasibility for a business idea
- Realize the problem that may be encountered when starting a small business/Enterprise
- Develop a business plan for a small business on the standard format
- Evaluate the business plan in a real market saturation

The knowledge requirements for this competency standard are listed below:

- Budgeting
- Forecasting
- Operational systems
- Relevant industrial awards and agreements
- Communication techniques
- Logical and analytic methods
- Profit and loss and cash flow systems
- working knowledge of environmental, OHS, industrial relations, taxation, corporate and industry legislation as they relate to the enterprise

Critical Evidence(s) Required

The candidate needs to produce following critical evidences in order to competent in this competency standard. Competence in develop and review a business plan requires evidence that demonstrates ability to scope the business plan and determine key objectives and targets. It also requires competence in specifying key performance targets, assessing the relevance of the business plan, and trial systems. The business plan also needs to be documented and reviewed.

The skills and knowledge required to develop and review a business plan must be transferable to a different work environment. For example, if competence is demonstrated in developing a

business plan for a small enterprise, it must also be evident in reviewing a business plan in medium or large enterprise environment.

0720-M&P-43 Manage Human Resources

Overview:

This competency standard covers the skills and knowledge required to manage human resources and to manage and develop human resources to achieve organization's operational objectives

Competency Unit	Performance Criteria
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<p>1. Lead and motivate people</p>	<p>P1. Establish goals for people and teams to optimise achievement in work tasks.</p> <p>P2. Take into account the capabilities of people and teams.</p> <p>P3. Provide advice and support sensitive to the individual's needs to people in the performance of their duties.</p> <p>P4. Undertake activities to achieve commitment to common goals.</p> <p>P5. Recognise and encourage initiative and innovation</p> <p>P6. Recognise and communicate achievements within the organisation.</p>
<p>2. Undertake human resource planning</p>	<p>P1. Determine human resource needs within the anticipated operational needs and allocated budget.</p> <p>P2. Analyse alternatives to staffing levels which clearly demonstrate returns to the organisation.</p> <p>P3. Develop contingency plans for staffing which meet key provisions of the human resources plan.</p> <p>P4. Compare existing competencies of staff with the needs of the work group.</p> <p>P5. Plan staffing levels and negotiate with stakeholders within the organisational framework to achieve maximum efficiency of operations.</p>
<p>3. Develop and facilitate performance</p>	<p>P1. Negotiate performance criteria individuals, teams and work groups.</p> <p>P2. Review performance criteria as circumstances change.</p> <p>P3. Conduct performance appraisal based on clearly established and agreed performance criteria.</p> <p>P4. Identify and propose the total performance development system strategies to rectify</p>

	<p>performance shortfalls and recognise success.</p> <p>P5. Address performance problems confidentially and in a constructive and timely manner, in line with relevant organisational procedures.</p> <p>P6. Make selections, transfers and promotions in accordance with organisation policies and supported with documented information.</p> <p>P7. Develop and implement mechanisms for the identification of human resource development needs within the work group taking account of the strategic plan for the organisation.</p>
<p>4. Facilitate training, education and development opportunities</p>	<p>P1. Make information on planned training events widely available throughout the organisation.</p> <p>P2. Include training, education and development plans as part of individual/team performance plans.</p> <p>P3. Facilitate individual/team access to, and participation in, training, education and development opportunities.</p> <p>P4. Contribute coaching and mentoring effectively to the training, education and development of personnel in an environment of change.</p> <p>P5. Enhance training, education and development opportunities of individual, team and organisational performance.</p> <p>P6. Create workplace environment in which facilitates training, education and development</p>

Knowledge and understanding

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

- Describe the hiring method/Procedures
- Describe the term & conditions of services and job description for various employments

- Describe the characteristics of successful sales personals
- Communication principles
- Conflict resolution principles and practice
- Equal Employment Opportunity
- Grievance procedures
- interpersonal relations
- Leadership theory and principles
- Management principles and practice
- Occupational Health and Safety
- Training and education principles
- Training need analysis

Critical Evidence(s) Required

The candidate needs to produce following critical evidences in order to competent in this competency standard.

- It is essential that competence be demonstrated in the application of human resource management in a wide range of contexts in achieving the organisation's objectives.
- Evidence should be gathered over a period of time in a range of actual or simulated workplace environments.
- Evidence of competent performance should be obtained by observing an individual in a management role within the workplace or exercise or operational environment. Knowledge may be assessed through written assignments, project reports, debriefings and action learning projects.

0720-M&P-44 Market products and services

Overview:

This competency standard covers the skills and knowledge required to market products and services.

Competency Unit	Performance Criteria
<p>1. Analyze market information</p>	<p>P1. Identify, research and analyse existing or new markets for existing or new products or services using techniques to ensure reliable data</p> <p>P2. Analyse past trends and developments to determine market variability and associated risks</p> <p>P3. Develop gross margin budgets to account for market variability</p> <p>P4. Identify and evaluate competing products to determine strengths and weaknesses of own products</p> <p>P5. Monitor market environment to ensure information is current and reliable</p> <p>P6. Identify the legal, ethical and environmental constraints of the markets and their effect on the enterprise</p> <p>P7. Identify product specifications that suit market requirements and price advantage at the time</p> <p>P8. Present clear and concise information to the enterprise management team.</p>
<p>2. Identify and evaluate factors to include in a marketing plan</p>	<p>P1. Identify and evaluate production processes to ensure required product specifications are met</p> <p>P2. Identify and assess alternative selling strategies and techniques to identify marketing targets and methods</p> <p>P3. Identify and assess distribution channels and their role in your marketing strategies</p> <p>P4. Ensure the data used is reliable and the market environment and trends are substantiated</p> <p>P5. Evaluate the role of marketing professionals in</p>

	providing advice
3. Develop a marketing plan for your products and services	<p>P1. Establish marketing objectives based on current and potential product specifications</p> <p>P2. Select appropriate production processes to ensure product specifications are met</p> <p>P3. Select selling strategies to ensure required prices are achieved</p> <p>P4. Select appropriate distribution channel options to ensure access to target markets is achieved efficiently and appropriately</p> <p>P5. Establish time-frames for production, distribution and selling activities</p> <p>P6. Develop a gross margin budget to demonstrate the cost effectiveness of the marketing plan</p> <p>P7. Develop partial gross margin budgets to account for market variability</p>
4. Determine promotional strategies	<p>P1. Prepare and record detailed plans for promotional activities</p> <p>P2. Outline objectives, level of exposure and available markets</p> <p>P3. Ensure strategies take account of time management and scheduling issues, and resource constraints</p> <p>P4. Create promotional materials that enhance the product and commercial presentation</p> <p>P5. Record and communicate priorities, responsibilities, timelines and budgets for promotional activities.</p>
5. Implement marketing activities	<p>P1. Schedule planned marketing activities within appropriate timeframes</p> <p>P2. Develop measurable performance targets that meet business plan objectives</p> <p>P3. Organise distribution channels and ensure product and service information is accurate and readily available to clients</p>

	<p>P4. Implement marketing activities within budgetary constraints to meet legal, ethical and enterprise requirements</p>
<p>6. Evaluate marketing performance.</p>	<p>P1. Review the established marketing objectives to ensure they remain viable</p> <p>P2. Make an objective assessment of the marketing plan and its implementation by a comparison of valid and reliable data against the established objectives</p> <p>P3. Assess product, pricing and distribution policies in relation to market changes, marketing objectives and enterprise requirements</p> <p>P4. Identify areas of positive marketing performance and take corrective action to remedy poor marketing performance areas</p> <p>P5. Document and distribute information for continual analysis and effective planning management</p>

Knowledge and understanding

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

- Describe the life cycle of product
- Identify the various ways of selecting suppliers,
- Explain the inventory management of stock, raw material and finished goods etc.
- Appreciate the importance of financial record keeping in a small business
- Explain techniques to keep cost as low as possible
- Develop balance sheet for a small enterprise
- Explain the operating cycle concept
- Explain the income tax computation procedure for a small business
- Explain the basic scheme of sales tax
- Explain the assessment procedure for returns and filling of returns.

Critical Evidence(s) Required

The evidence required to demonstrate competency in this unit must be relevant to workplace operations and satisfy holistically all of the requirements of the performance criteria and required skills and knowledge and include achievement of the following:

- Identify the marketable features of the product and potential markets
- Develop a range of marketing alternatives
- Collect and analyses data to assess alternatives in a marketing plan
- Evaluate performance targets and recommend modifications or improvements
- Implement and evaluate a marketing plan
- Plan to manage promotional activities.

0720-M&P-45 Monitor and review business performance
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Overview:

This competency standard covers the skills and knowledge required to monitor and review business performance

Competency Unit	Performance Criteria
1. Evaluate commercial performance	<p>P1. Gather and analyse data relating to enterprise performance to identify historical and current performance.</p> <p>P2. Review and analyse operational structures to determine the suitability of organisational processes to enterprise objectives.</p> <p>P3. Evaluate enterprise strengths and weaknesses against market conditions to determine current and future capacities.</p> <p>P4. Evaluate enterprise objectives are to identify variations and scope for future development.</p>
2. Allocate and co-ordinate business resources	<p>P1. Identify and communicate roles and responsibilities of personnel.</p> <p>P2. Identify resource requirements for enterprise and cost them using standard financial analysis techniques.</p> <p>P3. Calculate costs of ensuring sustainability of enterprise operations and factor into business planning for the enterprise.</p>
3. Identify performance requirements	<p>P1. Develop realistic performance indicators within available timeframes and resource</p> <p>P2. Identify and minimize factors inhibiting performance against objectives.</p> <p>P3. Monitor and assess market conditions based on relevant data.</p> <p>P4. Prepare and incorporate strategies and programs to promote the sustainability of operations into enterprise procedures.</p>

4. Review business performance

P1. Review regularly enterprise operations to identify opportunities for improvements in performance.

P2. Monitor and anticipate impact of natural conditions on enterprise to assess sustainability of resource use.

P3. Compare costs and estimates with resource allocation.

P4. Determine operational plans to determine schedule of activities

Knowledge and understanding

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

- Rates of return for products and/or services
- Financial analysis techniques
- Structure and operation of small businesses relevant State/Territory Occupational Health and Safety (OHS)
- Legislative requirements
- Environmental conditions, positive environmental practices and negative impact minimisation measures
- Human resource requirements for the enterprise
- Transport requirements for the enterprise
- Enterprise/property improvement requirements.
- Market performance in commodities
- Statutory marketing requirements

Critical Evidence(s) Required

The evidence required to demonstrate competency in this unit must be relevant to workplace operations and satisfy holistically all of the requirements of the performance criteria and required skills and knowledge and include achievement of the following:

- Gather and analyses data relating to enterprise performance
- Review operational structures to determine effectiveness
- Identify available resources to assess capacity
- Develop realistic performance indicators
- Review enterprise operations against performance indicators
- Plan to improve business performance by addressing results of review.

0720-M&P-46 Negotiate for resolving business issues

Overview:

This competency standard covers the skills and knowledge required to negotiate for resolving business issues

Competency Unit	Performance Criteria
<p>1. Develop and implement issue resolution and grievance procedures</p>	<p>P1. Establish problem solving/issue resolution procedures within legislative requirements and organisation's guidelines.</p> <p>P2. Manage grievances and complaints are in a timely and caring way to optimise likelihood of a favourable outcome for all parties and in line with organisational objectives and procedures.</p> <p>P3. Document and communicate individual's rights and obligations under industrial awards/agreements and legislation are in a clear and concise manner and in appropriate language.</p> <p>P4. Conduct hearings, interviews and meetings within the principles of industrial democracy and participative, consultative processes.</p> <p>P5. Identify and invite all relevant industrial parties to participate in the resolution process.</p>
<p>2. Manage disciplinary matters</p>	<p>P1. Implement disciplinary matters in accordance with organisation's procedures.</p> <p>P2. Conduct investigations in a caring and confidential manner to maintain performance and morale.</p> <p>P3. Provide feedback promptly.</p> <p>P4. Institute appeals processes in accordance with organisational procedures.</p> <p>P5. Recognize and recommend deficiencies in procedures for changes made</p>

Knowledge and understanding

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

- Legislation
- Organizational behavior
- Problem solving Technique
- Identify reason of conflict

Critical Evidence(s) Required

The candidate needs to produce following critical evidences in order to competent in this competency standard.

- Solve any issue occurred.

0720-M&P-47 Coordinate a Team Work

Overview:

This unit is concerned with the competencies required to achieve operational outcomes and effective working relationships through managing and developing individuals and teams.

Unit of Competency	Performance Criteria
1. Develop and maintain a cooperative work group	<p>P1. Work contributions and suggestions from staff are</p> <p>P2. continually sought and encouraged</p> <p>P3. Contributions to work group operations are acknowledged and suggestions are dealt with constructively</p> <p>P4. Develop staff skills according to work requirements</p> <p>P5. Implement new work practices</p> <p>P6. Address conflict between staff members in accordance with current personnel practices.</p>
2. Communicate objectives and required standards	<p>P1. Inform the staff of the objectives and standards</p> <p>P2. Required</p> <p>P3. Commit to objectives and standards</p> <p>P4. Practices of safe, fair and participative work principals are and promote to staff</p>
3. Provide feedback on performance	<p>P1. Give constructive feedback on all aspects of work performance provided to individuals and team</p> <p>P2. Access and address performance in a fair and timely manner in accordance with relevant guidelines, procedures and natural justice</p>
4. Support and participate in development activities	<p>P1. Assess training needs of all staff, implemented and promoted</p> <p>P2. Devise an action plan to meet individual and group training</p> <p>P3. and development needs is collaboratively developed, agreed to and implemented</p> <p>P4. Identify specific training needs of individuals</p> <p>P5. Encourage staff in applying skills and knowledge in the workplace</p>

	<p>P6. Provide training to the required standard on the job</p> <p>P7. Support and encourage staff to attend training courses and to take up other development opportunities.</p>
<p>5. Provide leadership, direction and guidance to the work group</p>	<p>P1. Link between the function of the group and the goals of the organization</p> <p>P2. Participate in decision making routinely to develop, implement and review work of the group and to allocate responsibilities where appropriate</p> <p>P3. Give opportunities and encouragement to others to develop new and innovative work practices and strategies</p> <p>P4. Identify conflict and resolve with minimum disruption to work group function</p> <p>P5. Provide staff with the support and supervision necessary to perform work safely and without risk to health</p> <p>P6. Allocate tasks within the competence of staff and support with appropriate authority, autonomy and training</p> <p>P7. Supervise appropriately the changing priorities and situations and takes into account the different needs of individuals and the requirements of the task</p>

Knowledge and understanding

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

- Explain the principles of effective team operation
- Explain the principles of human resource management
- Describe the training delivery processes in the workplace
- Outline the industry assessment guidelines

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of the ability to coordinate a work team. 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.

0720-M&P-48 Develop Entrepreneurial Skills

Overview:

This Competency Standard identifies the competencies required to develop entrepreneurial skills by Mosaic Artist, in accordance with the organization's approved guidelines and procedures. You will be expected to develop a business plan, collect information regarding

funding sources, develop a marketing plan and develop basic business communication skills. Your underpinning knowledge regarding entrepreneurial skills will be sufficient to provide you the basis for your work.

Unit of Competency	Performance Criteria
<p>1. Develop a business plan</p>	<p>P1. Conduct a market survey to collect following information</p> <ul style="list-style-type: none"> ●Customer /demand ●Tools, equipment, machinery and furniture with rates ●Raw material ●Supplier ●Credit / funding sources ●Marketing strategy ●Market trends ●Overall expenses ●Profit margin <p>P2. Select the best option in terms of cost, service, quality, sales, profit margin, overall expenses</p> <p>P3. Compile the information collected through the market survey, in the business plan format</p>
<p>2. Collect information regarding funding sources</p>	<p>P1. Identify the available funding sources based on their terms and conditions, maximum loan limit, payback time, interest rate</p> <p>P2. Choose the best available option according to investment requirement</p> <p>P3. Prepare documents according to the loan agreement requirement</p> <p>P4. Include the information of funding sources in the business plan</p>
<p>3. Develop a marketing plan</p>	<p>P1. Make a marketing plan for the business including product, price, placement, promotion, and people, packaging and positioning</p> <p>P2. Include the information of marketing plan in the business plan</p>
<p>4. Develop basic business communication skills</p>	<p>P1. Communicate with internal customers e.g.: labor, partners and external customers e.g.: suppliers, customers etc., using effective communication skills</p> <p>P2. Use different modes of communication to communicate internally and externally e.g.: presentation, speaking, writing, listening, visual representation, reading etc.</p> <p>P3. Use specific business terms used in the market</p>

Knowledge and Understanding

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

- Explain 7ps of marketing including product, price, placement, promotion, people, packaging and positioning

- Describe 7Cs of business communication
- Define different modes of communication and their application in the industry
- Enlist specific business terms used in the industry
- Enlist the available funding sources
- Explain how to get loan to start a new business
- Explain market survey and its tools e.g.: questionnaire, interview, observation etc.
- Describe the market trends for specific product offering
- State the main elements of business plan
- Explain how to fill the business plan format

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

- List 7 Ps
- List 7Cs

Soft Skills

0720-M&P-49 Maintain professionalism in the workplace

Overview:

This unit of competency describes the outcomes required maintain a professional image in the workplace, including behaving ethically, demonstrating motivation, respecting timeframes and maintaining personal appearance.

Unit of Competency	Performance Criteria
1. Respect work timeframes	<p>P1. Demonstrate punctuality in meeting, set working hours and times.</p> <p>P2. Utilize working hours only for working and follow company regulations.</p> <p>P3. Complete work tasks within deadlines according to order of priority</p> <p>P4. Supervisors are informed of any potential delays in work times or projects.</p>
2. Maintain personal appearance and hygiene	<p>P1. Clean hair, body and nails regularly.</p> <p>P2. Wear suitable cloths for the workplace, and respect local and cultural contexts</p> <p>P3. Meet specific company dress code requirements</p>
3. Maintain adequate distance with colleagues and clients	<p>P1. Respect personal space of colleagues and clients with reference to local customs and cultural contexts.</p> <p>P2. Keep sufficient distance from others</p> <p>P3. Avoid cross transmission of infections (especially through respiration).</p>
4. Work in an ethical manner	<p>P1. Follow company values/ethics codes of ethics and/or conduct, policies and guidelines.</p> <p>P2. Use company resources in accordance with company ethical standards.</p> <p>P3. Conduct personal behavior and relationships in accord with ethical standards and company policies.</p> <p>P4. Undertake work practices in compliance with company ethical standards, organizational policy and guidelines.</p> <p>P5. Instruct co-workers on ethical, lawful and reasonable directives.</p>

P6. Share Company values/practices with co-workers using appropriate behavior and language.

P7. Report work incidents/situations and/or resolved in accordance with company protocol/guidelines.

Knowledge and understanding

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

- Explain application of good manners and right conduct
- Explain basic practices for oral and personal hygiene
- Describe common products used for oral and personal hygiene
- Outline the company code of conduct/values
- Outline the Company regulations, performance and ethical standards
- Explain work responsibilities/job functions
- Describe communication skills
- State workplace hygiene standards

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of the ability to maintain professionalism in the workplace. 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.

0720-M&P-50 Undertake project work

Overview:

This unit describes the skills and knowledge required to undertake a straightforward project or a section of a larger project. It covers developing a project plan, administering and monitoring the project, finalizing the project and reviewing the project to identify lessons learned for application to future projects. This unit applies to individuals who play a significant role in ensuring a project meets timelines, quality standards, budgetary limits and other requirements set for the project.

Unit of Competency	Performance Criteria
1. Define project	<p>P1. Access project scope and other relevant documentation</p> <p>P2. Define project stakeholders</p> <p>P3. Seek clarification from delegating authority of issues related to project and project parameters</p> <p>P4. Identify limits of own responsibility and reporting requirements</p> <p>P5. Clarify relationship of project to other projects and to the organization's objectives</p> <p>P6. Determine and access available resources to undertake project</p>
2. Develop project plan	<p>P1. Develop project plan in line with the project parameters</p> <p>P2. Identify and access appropriate project management tools</p> <p>P3. Formulate risk management plan for project, including Work Health and Safety (WHS)</p> <p>P4. Develop and approve project budget</p> <p>P5. Consult team members and take their views into account in planning the project</p> <p>P6. Finalize project plan and gain necessary approvals to commence project according to documented plan</p>
3. Administer and monitor project	<p>P1. Take action to ensure project team members are clear about their responsibilities and the project requirements</p> <p>P2. Provide support for project team members, especially with regard to specific needs, to ensure that the quality of the expected outcomes of the</p>

	<p>project and documented time lines are met</p> <p>P3. Establish and maintain required recordkeeping systems throughout the project</p> <p>P4. Implement and monitor plans for managing project finances, resources and quality</p> <p>P5. Complete and forward project reports as required to stakeholders</p> <p>P6. Undertake risk management as required to ensure project outcomes are met</p> <p>P7. Achieve project deliverables</p>
4. Finalize project	<p>P1. Complete financial recordkeeping associated with project and check for accuracy</p> <p>P2. Ensure transition of staff involved in project to new roles or reassignment to previous roles</p> <p>P3. Complete project documentation and obtain necessary sign-offs for concluding project</p>

Knowledge and understanding

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

- Give examples of project management tools and how they contribute to a project
- Outline types of documents and other sources of information commonly used in defining the parameters of a project
- Explain processes for identifying and managing risk in a project
- Outline the organization's mission, goals, objectives and operations and how the project relates to them.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of the ability to undertake project work. 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.

0720-M&P-51 Organize Schedules

Overview:

This unit describes the skills and knowledge required to manage appointments and diaries for personnel within an organization, using manual and electronic diaries, schedules and other appointment systems. It applies to individuals employed in a range of work environments who provide administrative support to teams and individuals.

Unit of Competency	Performance Criteria
<p>1. Establish schedule requirements</p>	<p>P1. Identify organizational requirements and protocols for diaries and staff planning tools</p> <p>P2. Identify organizational procedures for different types of appointments</p> <p>P3. Determine personal requirements for diary and schedule items for individual personnel</p> <p>P4. Establish appointment priorities and clarify in discussion with individual personnel</p>
<p>2. Manage schedules</p>	<p>P1. Identify recurring appointments and deadlines, and schedule these in accordance with individual and organizational requirements</p> <p>P2. Establish availability of attendees, and schedule new appointments in accordance with required timelines and diary commitments</p> <p>P3. Negotiate alternative arrangements and confirm when established appointments are changed</p> <p>P4. Record appointments and manage schedules in accordance with organizational policy and procedures</p>

Knowledge and understanding

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

- Identify the key provisions of relevant legislation, standards and codes that affect aspects of business operations or the achievement of team goals
- Describe organizational requirements for managing appointments for personnel within the organization
- Summarize the range of appointment systems that could be used
- Outline important considerations when managing the schedules of others.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of the ability to organize schedules. 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.

0720-M&P-52 Work safely in an office environment

Overview:

This unit describes the performance outcomes, skills and knowledge required to participate in workplace occupational health and safety (OHS) processes to protect workers own health and safety, and that of others.

Unit of Competency	Performance Criteria
1. Work safely	<p>P1. Follow established safety procedures when conducting work</p> <p>P2. Carry out pre-start systems and equipment checks in accordance with workplace procedures</p>
2. Implement workplace safety requirements	<p>P1. Identify designated persons for reporting queries and concerns about safety in the workplace</p> <p>P2. Identify existing and potential hazards in the workplace, report them to designated persons and record them in accordance with workplace procedures</p> <p>P3. Identify and implement workplace procedures and work instructions for controlling risks</p> <p>P4. Report emergency incidents and injuries to designated persons</p>
3. Participate in OHS consultative processes	<p>P1. Contribute to workplace meetings, inspections or other consultative activities</p> <p>P2. Raise OHS issues with designated persons in accordance with organizational procedures</p> <p>P3. Take actions to eliminate workplace hazards or to reduce risks</p>
4. Follow safety procedures	<p>P1. Identify and report emergency incidents</p> <p>P2. Follow organizational procedures for responding to emergency incidents</p>

Knowledge and understanding

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

- Explain responsibilities of employers and employees under relevant health and safety regulation
- Describe emergency procedures including procedures for fires, accidents and evacuation
- Outline commonly used hazard signs and safety symbols

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of the ability to participate in workplace OHS processes. 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.

NOTIFICATION

No. F. 5(13)/2018-DD (TE): In pursuance of sub-section (d) of section-6" Functions of the Commission" National Vocational & Technical Training Commission (NAVTTTC) Act-2011, NAVTTTC is pleased to approve and notify following qualifications in twenty (20) trades for Level 1-5 under National Vocational Qualification Framework (NVQF), which have been developed in compatibility with latest global trends in the fields and fulfilling requirements of competency based training and assessment (CBT&A) system. The qualifications have been developed and validated in collaboration with TEVTAs, QABs, industry and other relevant stakeholders: -

S#	National Vocational Qualifications
1.	National Qualification Level-5 diploma in Automobile Technology
2.	National Qualification Level-5 diploma in Civil Technology
3.	National Qualification Level-5 diploma in Construction Technology
4.	National Qualification Level-5 diploma in Information & Commutation Technology (ICT)
5.	National Qualification Level-5 diploma in Garment Manufacturing Technology
6.	National Qualification Level-5 diploma in Electrical Technology
7.	National Qualification Level-5 diploma in Electronics Technology
8.	National Qualification Level-5 diploma in Instrumentation Technology
9.	National Qualification Level-5 diploma in Computer Aided Design & Manufacturing (CAD /CAM)
10.	National Qualification Level-5 diploma in Mechanical Technology
11.	National Qualification Level-5 diploma in Graphics Designing
12.	National Qualification Level-5 diploma in Heating, Ventilation, Air-conditioning & Refrigeration (HVACR) Technology
13.	National Qualification Level-5 diploma in Media Production
14.	National Qualification Level-5 diploma in Hotel Management
15.	National Qualification Level-5 diploma in Professional Chef
16.	National Qualification Level-5 diploma in Tourism Management
17.	National Qualification Level-5 diploma in Hair & Beauty Services
18.	National Qualification Level-5 diploma in Fashion Designing
19.	National Qualification Level-5 diploma in Ceramics Technology
20.	National Qualification Level-5 diploma in Telecom Technology

2. All the TVET related institutions / organizations are required to implement aforementioned qualifications so that a uniform and standardized TVET qualification system is established in Pakistan and efforts are made for international equivalence / recognition of these qualifications.

3. Competency Standards of the above enlisted qualifications can be accessed at NAVTTC's website (www.navttc.org).



(Muqem Islam)

Director General (Skill Standards & Curricula)

Phone: 051-9215385

Distribution:

1. Federal Secretary, Ministry of Federal Education & Professional Training, Govt of Pakistan
2. Federal Secretary, Ministry of Overseas Pakistanis and Human Resource Development, Govt of Pakistan, Islamabad
3. Federal Secretary, Ministry of Industry and Production, Govt of Pakistan, Islamabad
4. Federal Secretary, Ministry of Textile Industry, Govt of Pakistan, Islamabad
5. Federal Secretary, Ministry of Commerce, Govt of Pakistan, Islamabad
6. Federal Secretary, Ministry of Railway, Govt of Pakistan, Islamabad
7. Federal Secretary, Ministry of Climate Change, Govt of Pakistan, Islamabad
8. Federal Secretary, Ministry of Religious Affairs, Govt of Pakistan, Islamabad
9. Federal Secretary, Ministry of Communication, Govt of Pakistan, Islamabad
10. Federal Secretary, Ministry of Aviation Division, Govt of Pakistan, Islamabad
11. Federal Secretary, Ministry of Science & Technology, Govt of Pakistan, Islamabad
12. Chairperson, Punjab Technical Education and Vocational Training Authority (P-TEVTA), Lahore
13. Managing Director, Khyber Pakhtunkhwa Technical Education and Vocational Training Authority (KP-TEVTA),
14. Managing Director, Sindh Technical Education and Vocational Training Authority (S-TEVTA), Karachi
15. Chairman, Azad Jammu & Kashmir, Technical Education and Vocational Training Authority (AJ&K TEVTA), Muzafarabad
16. Director TVET Cell, Gilgit Baltistan, Gilgit
17. Director General, Punjab Vocational Training Council (PVTC), Punjab

18. Managing Director, Technology Upgradation and Skill Development Company (TUSDEC)
Lahore
19. Project Director, Punjab Skill Development Program (PSDP) Lahore
20. CEO, Punjab Skill Development Fund, Lahore
21. Rector, UNTECH University Islamabad
22. National Deputy Leader, GIZ Islamabad
23. PS to Minister of Federal Education & Professional Training, Govt of Pakistan
24. PS to Special Adviser to the Prime Minister on Youth Affairs, Prime Minister's Office,
Islamabad
25. Chairperson, Federal of Pakistan Chamber of Commerce and Industry (FPCCI), Karachi
26. Conveyor, Sector Skills Council (Textile/ Construction/ Renewable Energy/ Hospitality and
Tourism)
27. Director Technical Education and Vocational Training Authorities (TEVTA), Balochistan
28. Chairman, Pakistan Tourism Development Corporation, Lahore
29. Chairman, PCSIR Headquarters, Islamabad
30. Director General, Pakistan Forest Institute, Peshawar
31. Chairman, Wafaq ul Madaris, Multan
32. Director General, Staff Welfare, Islamabad
33. Director General, NISTE Capital Administration and Development Division, Islamabad
34. Director General, National Training Bureau, Islamabad
35. Chairmen, Provincial Technical Education Boards
36. Chairmen, Provincial Trade Testing Boards
37. Secretary, IBCC, Islamabad: *with the request that National qualifications of Level 5 diploma
in the aforementioned trades may be considered equivalent to Diploma of Associate
Engineer/HSSC after inclusion of compulsory courses in the light of IBCC general
requirement.*

Copy for information to: -

1. DG (P&D)/(A&F)/ (A&C) (S&C) NAVTTC
2. Director General(s), NAVTTC Regional Office(s).
3. Sr. Technical Advisor, TSSP-GIZ
4. Staff Officer to Chairman, NAVTTC
5. PS to Executive Director, NAVTTC Islamabad
6. Concerned File/ Office Copy

