

**National Competency Standard level 2 for Computer Aided Design &
Manufacturing (CAD /CAM)
(Junior Draftsman)**



National Vocational & Technical Training Commission (NAVTTTC)

ACKNOWLEDGEMENTS

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NAVTTTC team under the leadership of Dr. Muqeem 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 has 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-2 across the globe for 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. Summary of competency standards

Sr No	Competency Standards	Occupation	NVQF Level	Category	Estimated Contact Hours			Cr Hr .
					Th	Pr	Total	
Level 2								
1.	Perform Basic Manual Drawing	Junior Draftsman	2	Technical	12	48	60	6
2.	Construct different engineering curves		2	Technical	12	48	60	6
3.	Perform free hand sketching (isometric)		2	Technical	15	65	80	8
4.	Construct Multi-view drawings (sectioning)		2	Technical	15	65	80	8
5.	Develop 2D Drawings in AutoCAD		2	Technical	28	112	140	14
6.	Perform Basic computer Operations		2	Functional	12	48	60	6
7.	Follow Safety Rules at Site		2	Functional	12	48	60	6
8.	Perform Basic Communication Skills		2	Functional	14	46	60	6
	Total				120	480	600	60
	Percentage				20	80	100	

4. Date of Validation

The level 2 of National qualification on CAD/CAM technology 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**

5. Date of Review

The level 2 of National qualification on Computer Aided Design & Manufacturing (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**

6. 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
0720 C/C & M1	National Certificate of level 2 in Computer Aided Design & Manufacturing (CAD /CAM) (Junior Draftsman)

7. Members of Qualifications Development Committee

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

Sr.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)

8. 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

9. Entry Requirements

The entry National Certificate level 2 in Computer Aided Design & Manufacturing (CAD /CAM) (Junior Draftsman) are

1. A person having **Middle certificate**.

DETAIL OF COMPETENCY STANDARDS

0720 C/C & M 1-A 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
CU1. Draw single stroke capital vertical lettering.	P1. Prepare Drawing sheet. P2. Select the tools. P3. Use Proper pencil for lettering with holding techniques. P4. Draw Boundary lines as per standards. P5. Make title bar P6. Draw upper and lower lines for lettering according to standards. P7. Start Writing Vertical Lettering with different style like Gothic, Roman and free hand lettering.
CU2. Draw single stroke capital inclined lettering.	P1. Prepare Drawing sheet. P2. Select the tools. P3. Draw Boundaries lines as per standards. P4. Make title bar P5. Draw upper and lower lines for lettering according to standards. P6. Start Writing inclined Lettering with different style like Gothic, Roman and free hand lettering.
CU3. Draw engineering drawing lines.	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 the engineering drawing lines including part outlines, section lines, hidden lines, centre lines, dimension lines, extension lines, cutting plane, break lines.
CU4. Draw different types of circles, half circles, radius with compass	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 different diameters circles and half circles.
CU5. Draw Different Lines	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 Center lines, P7. Draw parallel-lines, P8. Draw perpendicular & bisects line, P9. Draw equal division of lines P10. Draw crossing line
CU6. Draw round corners, circles elements, quadrilaterals	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 different diameter circles. P7. Draw a quadrilateral as per given dimension.
CU7. Draw different types of triangles	P1. Prepare Drawing sheet. P2. Select the tools. P3. Draw Boundaries lines as per standards. P4. Make title bar P5. Divide the sheets in different equal parts. P6. Draw Equilateral Triangle, Isosceles triangle, P7. Scalene Triangle, Right Triangle, Obtuse Triangle, Acute Triangle.

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.	Pencils (HB, H,2H) etc.


0720 C/C & M 1-B 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
CU1. Construct inscribe and circumscribe figures.	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 square, triangle and hexagon according to dimension.
CU2. Draw polygons by circumscribe method.	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 various polygons (Pentagon, Hexagon, Heptagon, Octagon)
CU3. Draw polygons by inscribe method.	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 pentagon, Hexagon and Octagon.
CU4. Construct Tangents of circles (Inner & External)	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 inner tangents of two circles when the center of the circle is known. P7. Draw inner tangents of two circles when the center of the circle is unknown P8. Draw external tangent of a circle when the center of the circle is known P9. Draw external tangent of a circle when the center of the circle is known

CU5. Draw Ellipse	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 an Ellipse by Concentric Circle. P7. Draw an Ellipse by Rectangle Method P8. Draw an Ellipse by Oblong Method P9. Draw an Ellipse by Arcs of Circle Method P10. Draw an Ellipse by Rhombus Method. P11. Draw an Ellipse by Basic Locus Method
CU6. Draw a parabola curve	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 a parabola curve by Rectangle P7. Draw a parabola curve by Method of Tangents (Triangle Method) P8. Draw a parabola curve by Basic Locus Method
CU7. Draw a hyperbola curve	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 a hyperbola curve.
CU8. Draw an Archimedean Spiral curve	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 Archimedean Spiral curve.
CU9. Draw involute curve	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 involute curve by square P7. Draw involute curve by rectangle P8. Draw involute curve by hexagon P9. Draw involute curve by circle.
CU10. Draw of cycloid, epicycloid, and hypocycloid	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.

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- P6.** Draw the generating circle and the base line equal to the circumference of the generating 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
4.	Pencils (HB, H, 2H)

0720 C/C & M 1-C Perform free hand sketching (Isometric)

Overview:

This competency standard covers the skills and knowledge required to construct the free hand sketching of isometric views of an object/drawing.

Competency Units	Performance Criteria
CU1. Identify various sides of an isometric views show solid and hidden parts of it.	P1. Select an isometric view. P2. Identify its Top, Front and Side view P3. Identify any solid or hidden profile in the isometric view/drawing
CU2. Construct Top, Front & Side views from an isometric view of an object/drawing	P1. Select the angle of projection (1 st or 3 rd angle) P2. Draw the Side view of object P3. Draw the Top view of object from its isometric view P4. Draw the Front view of object from its isometric view P5. Draw the Side view of object from its isometric view P6. Cross check the views for any correction according to standards.

Knowledge & Understanding

The candidate must be able to demonstrate to draw the free hand isometric sketches of an object. Also, the candidate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Importance of Free Hand Sketches.
- Techniques of Free Hand sketching
- Define isometric views
- Draw Top, Front and Side views of Object/drawing

Critical Evidence(s) Required

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

- Explain 1st angle projection
- Explain 3rd angle projection
- Draw Top views of object
- Draw Front view of object
- Draw Side view of object
- Draw free hand isometric views/sketch of object/drawing

LIST OF TOOLS AND EQUIPMENT

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

0720 C/C & M 1-D Construct multi-view drawings (Sectioning)

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.

Also it will cover to make different sectional views an object in a drawing including full sections, half sections, offset sections, broken sections, rotated or revolved sections.

Competency Units	Performance Criteria
CU1. 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 in 1 st angle of Projection by orthographic projection. P7. Draw top view in 1 st angle of Projection by orthographic projection P8. Draw front view in 1 st angle of Projection by orthographic projection. P9. Draw side view in 1 st angle of Projection by orthographic projection.
CU2. 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 in 3rd angle of projection by orthographic projection. P7. Draw top view in 3rd angle of projection by orthographic projection. P8. Draw front view in 3rd angle of projection by orthographic projection. P9. Draw side view in 3rd angle of projection by orthographic projection.
CU3. Sketch Oblique View 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 oblique view of the given object at receding axis of 30 degree or 45 degree.
CU4. Construct multi view drawing of Simple Bearing.	P1. Prepare Drawing sheet. P2. Select the tools. P3. Draw Boundaries lines as per standards.

	<p>P4. Make title bar</p> <p>P5. Divide the sheets in equal parts.</p> <p>P6. Draw plan view of simple bearing</p> <p>P7. Draw front view of simple bearing</p> <p>P8. Draw side view of simple bearing</p>
CU5. Construct multi view drawing of Open Bearing	<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. Draw plan view of open bearing</p> <p>P7. Draw front view of open bearing</p> <p>P8. Draw side view of open bearing</p>
CU6. Sketch prism	<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. Sketch prism</p>
CU7. 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>
CU8. 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>
CU9. Draw the full section	<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. Draw the object/part</p> <p>P7. Draw the cutting plane line which passes fully through the object/part</p> <p>P8. Draw the section-lined areas which are portions that have been in actual contact with the cutting-plane</p>
CU10. Draw the half section	<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. Draw the object/part</p> <p>P7. Draw the cutting-plane line which cuts halfway through the part/object</p> <p>P8. Remove one quarter (1/4th) of the material</p>
CU11. Draw the offset section	<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. Draw the object/part</p> <p>P7. Draw offset Section views by bend the cutting plane at right angles to pass through the desired internal features</p>
CU12. Draw the broken section	<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. Draw the object/part in an orthographic view</p> <p>P7. Remove a small amount of material to show the interior details (without using a cutting-plane line)</p>
CU13. Draw the rotated/revolved section	<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. Draw the object</p> <p>P7. Show a cross-section of an area turned 90 degrees or perpendicular to the 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:

- 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
- Explain Full sections
- Explain Half sections
- Explain Offset sections
- Explain Broken sections

- Explain Rotated or revolved sections.

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
- Draw different types of sections (Full, Half, Offset, Broken, rotated/revolved)

LIST OF TOOLS AND EQUIPMENT

Sr. No.	Description
1.	Drawing Board
2.	Drawing Box
3.	Drawing Sheets
4.	T-Squares

0720 C/C & M 1-E 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 AutoCAD to meet specific intentions according to job requirements.

Competency Units	Performance Criteria
LU1. Develop 2D Objects	P1. Setup & save drawing interface for required specifications. P2. Setup user interface settings for required specifications. P3. Create 2D objects with given measurements. P4. Edit 2D Objects to meet set standards.
LU2. Prepare Final Set of 2D Drawings	P1. Develop 2D Drawing with given project specification and measurements. P2. Plot drawing on scale according to required size & orientation.

Knowledge & Understanding

This competency standard will provide knowledge related to:

- Basic drawing concepts
- Terminologies and vocabulary of AutoCAD software.
- Types of Unit measurement systems and conversions.
- Scale and paper sizes
- Commands and tools

Critical Evidence(s) Required

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.	Mouse
3.	AutoCAD Software
4.	Printer/Plotter
5.	Papers for printing

0720 C/C & M 1-F Perform Basic Computer Operations

Overview:

This competency standard will provide skills and knowledge related to basic computer hardware, software, applications and troubleshooting. You will be able to demonstrate your skills in operating a computer system and software such as MS Word, MS PowerPoint, MS Excel as well as installation and troubleshooting of operating system and software.

Competency Units	Performance Criteria
CU1. Configure Computer System	P1. Connect computer components and peripherals as per requirement. P2. Install Drivers and applications according to the software specification. P3. Troubleshoot Applications to trace and fix faults in a specific application to bring it in a running condition. P4. Follow health, safety and security procedures to ensure safe working environment.
CU2. Create a Document using MS Word	P1. Compose a document as per the requirement. P2. Format Word Document according to given requirements. P3. Print Word Documents according to requirements.
CU3. Preparer a Worksheet using MS Excel	P1. Develop a worksheet as per given data. P2. Format the worksheet according to given criteria. P3. Apply Formulas according to the requirement. P4. Generate Charts/Graphs according to the given data.
CU4. Prepare a presentation using MS PowerPoint	P1. Insert Slides with different Layouts according to requirements of presentation. P2. Insert text, tables, images, etc. according to the requirement. P3. Apply a set of effects to animate the slide according to requirement. P4. Apply Slide Transitions on Slides according to requirement. P5. Apply Sound Effects on Objects/text/images according to requirement. P6. Present a presentation according to 7Cs of communication.

Knowledge & Understanding

This competency standard will provide knowledge related to:

- Operating systems
- Hardware and Software
- Troubleshooting
- Internet and E-mailing

- Hyperlink and referencing
- Printing
- Formulas
- Short Keys
- WPM (Word Per Minute)
- 7 Cs of communication

Critical Evidence(s) Required

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

- Install MS Office Application correctly
- Prepare a formatted document using MS Word
- Enter data into the respective columns and rows as per given instructions
- Set page layouts and margins
- Apply any slide transition on entire presentation.

LIST OF TOOLS AND EQUIPMENT

Sr. No.	Description
1.	PCs/Laptops
2.	Mouse
3.	AutoCAD Software
4.	Internet Connection
5.	Printer / plotter
6.	Printer papers

0720 C/C & M 1-G Follow Safety Rules at Site

Overview: This competency standard covers the skills and knowledge required to work according to personal health and safety protocol at site. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Maintain occupational safety and health at workplace	<p>You must be able to:</p> <p>P1. Identify the safety signs and symbols</p> <p>P2. Erect barricades, hoardings, signage in the hazardous areas</p> <p>P3. Maintain housekeeping</p> <p>P4. Report unsafe condition to immediate supervisor (shift position)</p>
CU2. Use Personal Protective and Safety Equipment (PPE)	<p>You must be able to:</p> <p>P1. Identify risk associated with job to be done</p> <p>P2. Select PPE according to job</p> <p>P3. Wear PPE according to job</p> <p>P4. Store PPE at Designated place after use</p>
CU3. Perform Communication Signals	<p>You must be able to:</p> <p>P1. Identify different types of communication hand signals.</p> <p>P2. Use appropriate hand signals as per situation.</p>
CU4. Carry out Basic first aid treatment	<p>You must be able to:</p> <p>P1. Follow COVID-19 SOP's</p> <p>P2. Identify basic elements for first aid kit</p> <p>P3. Maintain a fully stocked first aid kit</p> <p>P4. Check expiry date of medicines</p> <p>P5. Perform mock first aid treatment for minor injuries</p>

Knowledge & Understanding

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

- K1. Types of hazards involved in site
- K2. Verbal and nonverbal (Hand Signals) communication
- K3. Basic first aid treatment
- K4. Safety signs and symbols
- K5. Manual handling of loads
- K6. Standard procedure of handling, storing and stacking material.
- K7. Usage of Appropriate PPE for different situations

Critical Evidence(s) Required

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

- Use of PPEs according to hazard/job
- Keep the workplace clean and tidy

- Balance the load while handling manually
- Use of first aid kit

TOOLS AND EQUIPMENT

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

S. No.	Items
1.	PPEs
2.	First Aid Kit
3.	Different types of waste bins
4.	Different types of barricading
5.	Safety sign boards

0720 C/C & M 1-H Perform Basic Communication Skills

Overview: This competency standard covers the skills and knowledge required to assist in the development of communication competence by providing information regarding different forms of communication and their appropriate use. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Demonstrate the basic Communication skills	<p>You must be able to:</p> <p>P1. Demonstrate the listening skills P2. Demonstrate the reading skills P3. Demonstrate the writing skills P4. Demonstrate the speaking skills</p>
CU2. Follow Supervisor's instructions	<p>You must be able to:</p> <p>P1. Carry out the instructions of the supervisor P2. Report to the supervisor as per organizational SOPs given standards.</p>
CU3. Develop Generic communication skills at workplace	<p>You must be able to:</p> <p>P1. Develop basic reading skills P2. Develop Basic Writing Skills P3. Develop basic listening skills</p>

Knowledge & Understanding

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

- K1. Reporting techniques
- K2. Application of Work ethics
- K3. Good communication skills (7Cs of effective communication)
- K4. Workplace dress code
- K5. The role of team members and functionality of the teams
- K6. Team dynamics
- K7. Basic Reading Skills
- K8. Basic Writing skills
- K9. Basic Verbal communication skills
- K10. Basic Problem-solving skills
- K11. Basic Self-Management Skills
- K12. Basic Technology Skills
- K13. Basic Interview Skills

Critical Evidence(s) Required

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

- Maintain effective communication with colleagues and supervisors
- Prepare different office reports

TOOLS AND EQUIPMENT

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

S. No.	Items
1.	Note book
2.	Pen
3.	Computer
4.	Multimedia

Islamabad 31st May, 2019

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).



(Muqeem 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
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