GOVERNMENT OF THE PUNJAB TECHNICAL EDUCATION & VOCATIONAL TRAINING AUTHORITY



CURRICULUM FOR

AUTO CAD (Civil)

(3 - Months Course)

Revised April 2016

APPROVED

Date: 7 - 4 - 16

Sign.

CURRICULUM SECTION

ACADEMICS DEPARTMENT

96-H, GULBERG-II, LAHORE Ph # 042-99263055-9, 99263064 gm.acad@tevta.gop.pk, manager.cur@tevta.gop.pk

TRAINING OBJECTIVES

In construction industry, the manual drafting been replaced by the computer aided drafting. Cumbersome and laborious manual drawing work which requires costly printing / drawing instruments has now become quite easy and interesting computer aided drawings / drafting. In view of new era, there is an urgent need for development of such course.

This curriculum is developed with a view to produce the workforce to meet the present and future demand of construction sector / industry by covering computer aided drafting / drawing pertaining to the construction field keeping in view the requirements of market demand by more focusing on practical and necessarily required theoretical knowledge along with new subjects of functional English & work ethics which would enable the pass outs to be absorbed in construction industry.

This curriculum covers the major topics of fundamental of civil technology, engineering drawing, computer applications, auto CAD alongwith Functional English & Information Technology.

CURRICULUM SALIENTS

Entry Level:

Matric + Basic Computer

Total Duration of Course:

3 Month

Total Training Hours:

400 Contact Hours

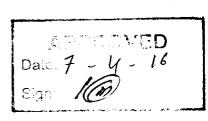
Training Methodology:

80 % Practical

20 % Theory

Medium of Instruction:

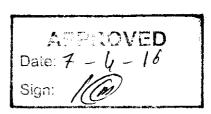
Urdu / English



SKILL COMPETENCY DETAIL

After successful completion of the course, the trainee would have acquired the following skills:

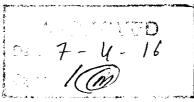
- 1. Draw various types of drawing
- 2. Draw any 2D view of the object
- 3. Draw 3D view of the object
- 4. Be able to render all type of drawings
- 5. Be able to draw detail drawing.
- 6. Be able to prepare various application drawings for Civil & Architectural application.
- 7. Be able to prepare various worksheets



KNOWLEDGE PROFICIENCY DETAIL

After successful completion of the course, the trainee would have acquired the knowledge of the following:

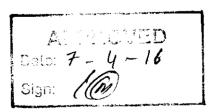
- 1. Define Engineering Drawing (Civil)
- 2. Describe Auto CAD
- 3. Work and complete task on Computer Application
- 4. Describe detail drawings on Auto CAD / drawing sheets
- 5. Describe 2D and 3D objects
- 6. Describe various work sheets
- 7. Describe application drawings for Civil & Architectural application.
- 8. Describe rendering procedure
- 9. Describe various type of drawings with its procedures



SCHEME OF STUDIES Auto CAD

(3-Months Course)

S.No	Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Fundamentals of Engineering Drawing	10	0	10
2.	Introduction to Auto CAD	4	12	16
3.	Orthographic Projections	12	24	36
4.	2D Building Drawing	12	54	66
5.	Submission Drawing	12	54	66
6.	Creating & editing 3D solids, 3D views & Rendering	12	54	66
7.	3D Modeling	6	74	80
8.	I.T Fundamentals	4	16	20
9.	Functional English	15	25	40
	Total	87	313	400



DETAIL OF COURSE CONTENTS Auto CAD

(3-Months Course)

1. Fundamentals of Engineering Drawing 1.1 Components of Building (Foundation, Plinth, Super structure & Parapet) 1.2 Building materials (Bricks, 2 Aggregates, Cement, P.C.C, D.P.C, R.C.C) 1.3 Measurement System 1.4 Types of Lines & Angles 1.5 Geometrical Shapes (Quadrilateral, 4 Circle, Triangle, Polygon, Geometrical Solids) 1.6 Area & Volume 1.7 Scale 2. Introduction to AutoCAD 2.1 Interface of Auto CAD 2.2 Application of Auto CAD in Engineering 2.3 Installation of Auto CAD 2.4 Creating file & Drafting setting 2.5 Description of 4Menus & Toolbars 2.6 Coordinate System 2.7 Dimensions & Text 2.8 Basic Commands 1 2.9 Practice to Install Auto CAD, create, copy, rename, save & delete files	Sr. No.		Detail of Topics	Theory Hours	Practical Hours
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2.6 Coordinate System 2.7 Dimensions & Text 2.8 Basic Commands 1 2.9 Practice to Install Auto CAD, create, copy, rename, save & delete files	:	2.4	Creating file & Drafting setting		
2.7 Dimensions & Text 2.8 Basic Commands 1 2.9 Practice to Install Auto CAD, create, copy, rename, save & delete files		2.5	Description of 4Menus & Toolbars	2	
2.8 Basic Commands 1 2.9 Practice to Install Auto CAD, create, copy, rename, save & delete files		2.6	Coordinate System		
2.9 Practice to Install Auto CAD, create, copy, rename, save & delete files		2.7	Dimensions & Text		
rename, save & delete files		2.8	Basic Commands	1	
		2.9	Practice to Install Auto CAD, create, copy,		3
0.40 December 10 10 10			rename, save & delete files		
2.10 Practice to apply Dratting setting, i.e. 2		2.10	Practice to apply Drafting setting, i.e.		2
Dimension style, Text style & height, units,			Dimension style, Text style & height, units,		

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		Drawing Limits & UCS		
	2.11	Practice to prepare A4,A3,A2,A1 size		1
		typical drawing Layout Templates		•
	2.12	Practice to apply Coordinate system to		2
		Draw different Geometrical Shapes		
		(Quadrilaterals, triangle, Regular	-	
		Polygons, Circle, ellipse)		
		By using of Draw Tool bar & Command		
		Aliases		
	2.13	Practice to use Standard & Modify Tool		2
		Bar to Modify Objects and Command		
		Aliases		
	2.14	Practice to use Dimension Tool Bar &		2
		Command Aliases		
3.	Orthograph	ic Projection		
	3.1	Basic Principles of Orthographic projection	12	24
	3.2	Practice to Draw different solids with three		
		views i.e. Top, Side & Front		
4.	2D Building	Drawing (Plan, Elevation & Section)		
	4.1	Introduction of Plans (Layout Plan,		
ı		Landscape Plan, Site Plan, Location Plan)	1	
	4.2	Introduction of Elevation		
	4.3	Introduction of Section		
	4.4	Introduction of Layers	1	
	4.5	Practice to create layers with colors & Line	1	4
		types also modification of layers.	1	
	4.6	Practice to draw plan of single room with		
		section and elevation.	2	6
	4.7	Introduction of Types of Text, Blocks,		
		Symbols & Design Library		
	4.8	Practice to insert Text, symbols, fixtures	*****	4

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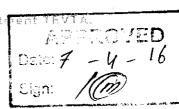
		from Design Library in the Drawing	1	
:	4.9	Practice to draw plan of a single storey	2	4
		residential unit having two bed rooms with		
		the help of a given sketch		
	4.10	Draw a detailed Plan of a Double Storey	1	6
		residential unit in layers		
	4.11	Introduction of Hatching, Regions,	1	
		Boundaries		
	4.12	Practice to create regions and hatch in		6
		different patterns		
	4.13	Practice to draw Site Plan, Location Plan		6
		and Landscape Plan	1	
	4.14	Practice to draw irregular traverse,		6
	4.15	Practice to calculate, add, subtract &		12
		distribute area.		
5.	Submissio	n Drawing		
	5.1	Introduction & components of	4	
		Submission Drawing		
	5.2	Prepare Submission Drawing of a		24
		Residential Building		
	5.3	Prepare Submission Drawing of a		24
		Commercial Building		
	5.4	Method of printing a drawing with	8	
		Printer/Plotter		
l	5.5	Practice to get print of a drawing		6
		prepared to an appropriate scale		
6.	3D Solids,	views & Rendering		
	6.1	Introduction of Basic 3D solid shapes	2	8
	6.2	Creating & editing basic 3D solid shapes,	2	
		using of Tool Bars i.e.(solids, shade,		
		surfaces, solids editing, view) & command		

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		Aliases	HANNE PARK CONTRACTOR	
	6.3	Introduction & classification of Pictorial		4
		Drawing i.e.(Isometric, Oblique,	2	
		Perspective Projection)		8
:	6.4	Practice to draw isometric view of	2	
		different 3D solid objects by using 3D		8
		commands	2	8
	6.5	Practice to draw Oblique view of different		
		3D solid objects by using 3D commands		
	6.6	Practice to draw Perspective view of		
		different 3D solid objects by using 3D		
		commands		18
	6.7	Introduction to Rendering its		
		features(shadows, lights)		
	6.8	Practice to draw 3D rendered view of the	2	
		following;		
		Office chair, Office table, Rostrum, Round		
		Table, Book Rack, sofa & Bed etc		
7.	3D Modeling	9		<u></u>
	7.1	Prepare 3D solid views of different types		
		of stairs (straight flight, Half turn &		10
		Geometrical)		
	7.2	Prepare 3D solid views of Balcony,		16
		columns, dooms & projections etc		
	7.3	Prepare 3D Model of a Single storey	4	16
		residential building	** 	
	7.4	Prepare 3D Model of a Double storey		16
		residential building		
	7.5	Prepare 3D Model of a Commercial	2	16
		building		
		Total	68	272
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LIST OF PRACTICALS

- Preparation of drawings on sheets i-e lines, angles and different geometrical figures.
- 2. Understanding lines, lettering and scales.
- 3. Practice for orthographic projections on sheet and Auto CAD.
- 4. Preparation for co-ordinates, text sheet setting on Auto CAD.
- 5. Preparation of different Geometrical figures.
- 6. Practice for elevation, layers, sections and plans on CAD.
- 7. Practice to insert symbols and fixtures.
- 8. Practice to prepare a double story building drawing with its cross section and elevations.
- 9. Method to print a drawing on plotter.
- 10. Practice for 3-D drawings.
- 11. Practice to prepare isometric views.
- 12. Prepare 3-D stairs with different geometrical figures.
- 13. Preparation 3-D model for single and double story building.
- 14. Prepare commercial building 3-D model.

SCHEME OF STUDIES I.T Fundamentals

Theory **Practical** Total Main Topics S.No Hours Hours Hours Introduction to Computers 1 4 5 1. Typing - Microsoft Word 8 2. 2 6 7 3. Internet & Electronic Mail 1 6 Total 04 16 20

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Date: 7 - 4 - 16

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DETAIL OF COURSE CONTENTS I.T Fundamentals

S. No		Detail of Topics	Theory Hours	Practical Hours
1	Intro	duction to Computers	1	4
	1.1	What is a computer- Definition, functions and general features?		
	1.2	What is Hardware – 1.2.1 Computer parts and units 1.2.1.1 Input Unit - Keyboard, Mouse etc. 1.2.1.2 Central Processing Unit 1.2.1.3 Output Unit		
	1.3	What is Software – 1.3.1 Electronic Parts of a Pc it is 1.3.1.1 Software and Its types 1.3.1.2 System Software, Application Software		
	1.4	Working with windows Operating System 1.4.1 How does windows desktops work?		
	1.5	What are the Icons, Shortcuts and other graphic, 1.5.1 How to see computer contents on different drives etc		
2	Typir	ng and Word processing (MS Word)	2	6
	2.1	Proper way of typing correct and speedy - getting familiar with the keys		
	2.2	Where to type in computer? How to save a file? How to get it back? Where to find your saved work?		
	2.3	How to get it printed?		
3	Emai	ling and Internet Surfing	1	6
	3.1	How to go to Internet, what is required for an internet connection etc.		
	3.2	How to use email? How to search on web? Etc		
	3.3	How to make new email account, login and logout an email account etc.?		
		Total	04	16

LIST OF PRACTICALS I.T Fundamentals

S. No.	Name of Practical
1.	Turn On/Off and setting of power supply
2.	Accessing The Desktop
3.	Using of Icons and Shortcuts
4.	Setting / customizing the desktop
5.	Viewing the contents of computer – Directory
6.	Copying, Deleting and Moving Files in a folder
7.	Working with different Applications
8.	Opening MS Word for typing
9.	First lesson of Typing A S D F
10.	Second Lesson of typing J K L;
11.	Third Lesson U I O P
12.	Fourth Lesson R E W Q
13.	Fifth Lesson N M , .
14.	Sixth Lesson V C X Z
15.	Seventh Lesson All letter using R index Finger
16.	Eighth Lesson All letter using L index Finger
17.	Formatting in MS Word Bold, Italic etc.
18.	Using Internet
19.	Opening Email, making new account
20.	Sending Receiving Emails

SCHEME OF STUDIES Functional English

S.No	Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Introduction of English Sentence Structure	2	3	5
2.	Use of present indefinite tense	2	3	5
3.	Use of 'is' 'are' 'am' questions and negatives	2	3	5
4.	Ask questions	2	3	5
5.	Express daily routines	2	3	5
6.	Know how to address people	1	2	3
7.	Provide written feedback	1	2	3
8.	Dialogues	1	2	3
9.	Understand vocabulary	1	2	3
10.	Application/C.V.	1	2	3
	Total	15	25	40

Sign:

DETAIL OF COURSE CONTENTS Functional English

S. No	Detail of Topics	Theory Hours	Practical Hours
1	Introduction of English sentence structure	2	3
2	Use of present indefinite tense with exercises	2	3
3	Use of 'is' 'are' 'am' questions and negatives	2	3
4	4.1 Ask questions 4.1.1 At work place 4.1.2 In the market 4.1.3 In classroom	2	3
5	5.1 Express daily routines 5.1.1 Before going to college 5.1.2 Dealing with colleagues 5.1.3 Going to market	2	3
6	6.1 Know how to address people 6.1.1 In Meetings 6.1.2 In class	1	2
7	7.1 Provide written feedback 7.1.1 After visiting the market 7.1.2 On some official task	1	2
8	8.1 Dialogues 8.1.1 With colleague 8.1.2 Teacher/student 8.1.3 Employer/employee 8.1.4 Booking on railway station	1	2
9	Understand vocabulary	1	2
10	Application / C.V.	1	2
	Total	(15	25 25 26 27

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LIST OF PRACTICALS Functional English

S. No.	Practical
1.	Group discussion
2.	Interviews
3.	Role play

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OF LABS

Auto CAD

Drawing Hall

I.T Fundamentals

Computer Lab

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FOR CLASS OF 25

Name of Trade	Auto CAD
Duration of Course	3-Months

S. No	Equipment / Tool	Quantity
1.	Main Server Adequately Configured To Support 25 Work Station Recommended latest software. (Specifications as per notification issued by MIS Section, TEVTA)	01 N o
2.	Desktop computer (Specifications as per notification issued by MIS Section, TEVTA)	25 (1 for each student & 1 for the teacher)
3.	Computer Operating Table	25 Nos.
4.	Revolving Chairs / Stool	25 Nos.
5.	Plotter	01 No.
6.	Internet Connection (At least 1 MB speed)	01
7.	Laser Printers	2 Nos.
8.	Scanner	2 Nos.
9.	Visualizer	01 No.
10.	Multimedia Projector	01 No.
11.	UPS 10 KVA	01
12.	Additional Table Hubs And Cable For Printers, Scanners	As required
13.	Office Table	01 No.
14.	Office Chair	01 No.
15.	Laboratory, Adequately Design for Computer Usage, Air Conditioned And Dust Proved with Complete Wiring And Electrical Fittings	AS required
16.	Air Conditioner 1 ½ Ton	02
17.	Application Software Auto CAD 2006 Or Latest	Installed on each system

The specifications of Tools/Equipment should be as per latest Notification issued by the MIS Department of TEVTA

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LIST OF CONSUMABLE MATERIAL

Functional English

S. No.	ltem	Quantity
1.	Stationery	As per requirement
2.	Board Markers	As per requirement

I.T Fundamentals

S. No.	ltem.	Quantity
1.	Printing Paper	As per requirement
2.	Printer Toner	As per requirement

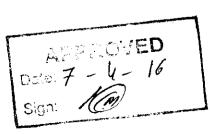
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EMPLOYABILITY OF PASS OUTS

The pass out of this course will be able to work in the following industries / areas:-

- 1. Self-employment
- 2. Design Offices Relating To
 - a. Architectural
 - b. Civil Engineering
 - c. Town Planning and Landscaping
 - d. All Those Where Drawing Work Has A Paramount Importance
 - e. To work as a draftsman in civil and architect offices



MINIMUM QUALIFICATION OF TEACHER / INSTRUCTOR

1. DAE (Architecture, Civil) with minimum 2-years' experience in relevant field.

OR

2. Two years trade proficiency certificate in civil draftsman (Auto Cad) with five-year teaching experience.

Functional English

M.A. (English)

I.T Fundamentals

DAE CIT/ BCS from HEC recognized university



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REFERENCE BOOKS

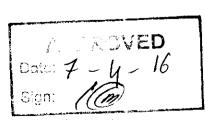
Title of Book	Name Of Author	Name of the Publisher
Architectural Drawing And Light Construction	Edward J. Muller	Prentice-Hall INC. Englewood Cliffs N.J
Auto CAD 2000 (No experience required)	David Frey	BPS Publications B-14 Connaught place, New Delhi-110001

Functional English

- 1. High School English Grammar By Wren & Martin
- 2. Oxford English Grammar

I.T Fundamentals

- 1. Introduction to Computer by Peter Norton
- 2007 Microsoft® Office System Step by Step by Joyce Cox, Steve Lambert and Curtis Frye
- 3. Internet and E-mail with Windows 7 by Studio Visual Steps



LIST OF TRADE RELATED JARGON

Arrowhead The part of a dimension or leader which points to an object or

extension line.

Attribute Information or data about a drawing object which can be hidden

or appear in the drawing as text.

Bezier curve A curve defined by endpoints, tangent lines, and control points

at the ends of the tangent lines.

Bitmap A pixel based graphic or image inserted in a drawing.

CAD Computer-aided design.

CADD Computer-aided design and drafting.

Center point The defining point at the exact center of a circle, arc, regular

polygon or ellipse.

Chamfer A diagonal line which connects points on two intersecting

objects such as an angled corner.

Class A category of objects (Vector works) to which objects can be

assigned and then manipulated as a group.

Color A property of any drawing object which defines the color in

which it appears on the screen and (possibly) the color in which

it is printed.

Constraint A drawing tool which limits drawing to a particular point, line or

angle.

Control points Points determining the path and shape of a Curve

Coordinates A system of numbers used to locate a point or object in a

drawing. In the Cartesian coordinate system 2 numbers x and y are used to describe the location of a point in the horizontal and

vertical dimensions respectively.

Cursor The screen symbol or icon which represents the current mouse

location relative to the drawing window or viewport.

Curve A complex entity created by the definition of endpoints of spline

curve sections.

Datum A temporary coordinate point set by the user which can be used

as a snap point or reference point when drawing.

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Dimension line A line, usually with an arrow indicating the direction and

distance of a drawing dimension.

Drawing Database The central part of a CAD drawing.

Edit The process of modifying a drawing object or entity.

Editing tools A class of drawing commands used to modify drawing entities or

objects.

Environment

The over-all setup of a CAD program including all drawing

settings, colors, units, tool palettes, comprise the drawing

environment.

Explode A common command which break objects apart into their

component pieces.

Extension line The line which extends from a measured line or object.

Fillet An arc connecting endpoints of two intersecting lines.

Fill A complex object defined by a series of points or a bordering

object such as a circle or polyline which fills the defined area

with solid color.

Font The typographic style property of <u>text</u>. Fonts may be drafting

style (one line thickness) or typographic such as that being used

in this document.

Grid A drawing tool which is usually a pattern of regularly spaced

dots or lines which make the alignment and drawing of objects

easier.

Group A collection of objects which can be manipulated as one object.

Handles A complex object defined by a series of points or a bordering

object such as a circle or polyline which fills the defined area

with a repeating pattern of lines.

Layer A property of any drawing object.

Leader A line with an arrowhead and attached text pointing at another

object.

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Leader line The line portion of a leader connecting the shoulder to

an arrowhead.

Line A CAD object defined by two endpoints.

Line type A property of any line, circle, curve, or arc.

Line width A property of any line, circle, curve, or arc.

Locus A drawing object with a single reference point and no physical

dimension.

Macro A sequence of commands recorded and saved for easy

playback.

Major axis The longer axis of an <u>ellipse</u>.

Manual entry The process of entering points manually by

typing coordinates as opposed to clicking within the viewport or

workspace.

Markers A line marker is used to mark the end points of lines.

Minor axis The shorter axis of an <u>ellipse</u>.

Move A drawing editing tool which moves objects or selection sets to

a new drawing location by changing all definition points by a

given distance.

Nested Objects inside of other objects.

Object handles In a windows CAD program the handles which appear when an

object is selected.

Offset The distance between two objects.

Origin The point in a drawing with the x,y coordinates of 0,0.

Ortho Short for orthogonal.

Pan The process of altering the drawing view by moving the

viewpoint laterally relative to the drawing.

Polygon A complex object composed of three or more straight lines in a

closed figure.

Polyline A complex object composed of two or more lines, curves, or

arcs which have contiguous endpoints.

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Primitive The simplest drawing objects from which all objects are built.

Prompt A program message often located on the programs status line.

Radial copy Also Duplicate Array.

Real scale Objects in a CAD program a drawn at full scale.

Redraw The process by which the video display is updated cleaning up

any unwanted marks or construction points.

Reference points Points associated with drawing objects which allow an object to

be selected, grouped, and manipulated.

Regenerate The process by which the view updated from the drawing

database cleaning up any unwanted marks or construction

points.

interpreted as relative to the last point entered.

Resolution The clarity or degree to which individual elements can be

discerned on a monitor or print/plot.

Rotate A drawing editing tool which rotates objects or groups of objects

based on a center of rotation and an angle.

Rubber banding A feature of many CAD programs which shows how a line or

other object will look before it is actually placed.

Scale An editing tool which changes the size of an object relative to

percentage.

Script A list of drawing commands which can be typed in a text editor

and then loaded and executed with one command.

Selection set One or more objects selected for action with a single command.

Shoulder The horizontal part of a <u>leader line</u>.

Snap A drawing tool which locates points exactly by finding an

existing point within the drawing database which is closest to a

point selected with the on the screen.

Snap to Grid A drawing constraint which forces all points picked to fall on the

currentl grid.

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Stretch	An editing tool which moves some of the points which define an object and leaves others.
Trim	A drawing editing command which causes one object to end exactly at another.
Symbol	A collection of drawing objects defined as a single complex entity.
Tangent	A line which intersects a circle, ellipse or arc at only one point.
Toggle	A drawing control or setting which is either on or off.
Units	Units of measure represented by numbers in a CAD program.
Vertex	A point defining the junction of a segment within polyline or polygon.
View	The graphical representation of the geometry stored in the drawing database which appears in the drawing window or viewport.
Viewport	The window or frame within which a view of the drawing is visible.
Zoom	The way the view is changed by magnifying or reducing the
	image on the screen.

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