GOVERNMENT OF THE PUNJAB

TECHNICAL EDUCATION & VOCATIONAL TRAINING AUTHORITY

TEVTA

GOVERNMENT OF THE PUNJAB

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In construction industry, the manual drafting been replaced by the computer aided drafting.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

APPROVED
Date: 7 - 4 - 16
Sign:

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

APPROVED
Date: 7 - 4 - 16
Sign:

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**

APPROVED
Date: 7-4-16
Sign:

DETAIL OF COURSE CONTENTS

Auto CAD
(3-Months Course)

Sr. No.	Detail of Topics	Theory Hours	Practical Hours
1.	**Fundamentals of Engineering Drawing**		-
	1.1 Components of Building (Foundation, Plinth, Super structure & Parapet)		
	1.2 Building materials (Bricks, Aggregates, Cement, P.C.C, D.P.C, R.C.C)	2	
	1.3 Measurement System		
	1.4 Types of Lines & Angles		
	1.5 Geometrical Shapes (Quadrilateral, Circle, Triangle, Polygon, Geometrical Solids)	4	
	1.6 Area & Volume		
	1.7 Scale	4	
2.	**Introduction to AutoCAD**		
	2.1 Interface of Auto CAD	1	
	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	
	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		3
	2.10 Practice to apply Drafting setting, i.e. Dimension style, Text style & height, units,		2

	Drawing Limits & UCS		
	2.11 Practice to prepare A4,A3,A2,A1 size typical drawing Layout Templates		1
	2.12 Practice to apply Coordinate system to Draw different Geometrical Shapes (Quadrilaterals, triangle, Regular Polygons, Circle, ellipse) By using of Draw Tool bar & Command Aliases		2
	2.13 Practice to use Standard & Modify Tool Bar to Modify Objects and Command Aliases		2
	2.14 Practice to use Dimension Tool Bar & Command Aliases		2
3.	**Orthographic 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, 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 types also modification of layers.	1 1	4
	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

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

7-4-16

		Aliases		
	6.3	Introduction & classification of Pictorial Drawing i.e.(Isometric, Oblique, Perspective Projection)	2	4
	6.4	Practice to draw isometric view of different 3D solid objects by using 3D commands	2	8
	6.5	Practice to draw Oblique view of different 3D solid objects by using 3D commands	2	8
	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 following; Office chair, Office table, Rostrum, Round Table, Book Rack, sofa & Bed etc	2	
7.	**3D Modeling**			
	7.1	Prepare 3D solid views of different types of stairs (straight flight, Half turn & Geometrical)		10
	7.2	Prepare 3D solid views of Balcony, columns, dooms & projections etc		16
	7.3	Prepare 3D Model of a Single storey residential building	4	16
	7.4	Prepare 3D Model of a Double storey residential building		16
	7.5	Prepare 3D Model of a Commercial building	2	16
		Total	**68**	**272**

LIST OF PRACTICALS

1. 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

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

APPROVED
Date: 7-4-16
Sign:

DETAIL OF COURSE CONTENTS

I.T Fundamentals

S. No	Detail of Topics	Theory Hours	Practical Hours
1	**Introduction to Computers** 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	1	4
2	**Typing and Word processing (MS Word)** 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?	2	6
3	**Emailing and Internet Surfing** 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.?	1	6
	Total	04	16

7-4-16

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

7 - 4 - 16

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**

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**

LIST OF PRACTICALS
Functional English

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

OF LABS

Auto CAD

- Drawing Hall

I.T Fundamentals

- Computer Lab

LIST OF TOOLS AND EQUIPMENT

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 No
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

APPROVED
Date: 7-4-16
Sign:

LIST OF CONSUMABLE MATERIAL

Functional English

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

I.T Fundamentals

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

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

APPROVED
Date: 7 - 4 - 16
Sign:

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
2. 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.

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 text. 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.

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 ellipse.
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 ellipse.
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.

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.
Relative coordinates	Drawing coordinates which when manually entered are 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 leader line.
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.

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.

APPROVED
Date: 7 - 4 - 16
Sign:

Curriculum Revision Committee

1.	**Engr. Mazhar Abbas Naqvi** Principal, Govt. Staff Training College, Faisalabad	**Convener**
2.	**Mr. Nadeem Zaigham,** Sr. Instructor, GCT Raiwind Road, Lahore	**Member**
3.	**Muhammad Saleem Anjum,** Jr. Instructor (Civil), GCT Sahiwal	**Member**

APPROVED
7-4-16