GOVERNMENT OF THE PUNJAB

TECHNICAL EDUCATION & VOCATIONAL TRAINING AUTHORITY

CURRICULUM FOR

CIVIL DRAFTSMAN (Auto CAD)

(6 – Months Course)

CURRICULUM SECTION

ACADEMICS DEPARTMENT

96-H, GULBERG-II, LAHORE

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In construction industry, the manual drafting been replaced by the computer aided drafting.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

CURRICULUM SALIENTS:

Entry Level	:	Matric
Total Duration of Course	:	6 Months
Total Training Hours	:	800 Hours
		40 Hours per week
		Hours per day except Friday 5 Hours
Training Methodology	:	Practical 90 %
		Theory 10 %
Medium of Instruction	:	Urdu / English

SKILL PROFICIENCY DETAILS

On successfully completion of this course, the trainee should be able to: -

1. Prepare detailed drawings for a residential unit including water supply, sanitary & electrification plans.
2. Prepare detailed drawings of frame structure building.
3. Prepare detailed drawing of different civil works such as culvert, bridges, etc.
4. Prepare 2 D drawings of residential / commercial building by using Auto CAD.
5. Use CAD in preparing detailed drawings for different Civil works.
6. Prepare rough cost estimate of residential commercial units.
7. Prepare 3 D drawings of residential / commercial building using Auto CAD.

KNOWLEDGE PROFICIENCY DETAILS:

On successful completion of this course, the trainee should be able to: -

1. Explain the relationship between Plan, Elevation & Section
2. Explain the masonry and frame structures & their components.
3. Explicate the building byelaws & specifications.
4. Explain the usage of CAD in 2D & 3D drafting.
5. Explain how to prepare detailed drawings for different Civil works with the proper use of Auto CAD.

CURRICULUM DELIVERY STRUCTURE

	Curriculum Delivery	Revision	Co-curricula Activities	Final Test	Total
WEEK	1-20	21	22-25	26	26
	20	1	4	1	

SCHEME OF STUDIES

Civil Draftsman (AutoCAD)
(6 – Months Course)

Sr. No.	Subjects	Theory Hours	Practical Hours	Total Hours
1	Fundamental of Civil Technology	13	30	43
2	Engineering Drawing	16	150	166
3	Computer Applications	11	110	121
4	AutoCAD	20	390	410
5	Functional English	20	20	40
6	Work Ethics	-	20	20
Total		**80**	**720**	**800**

DETAIL OF COURSE CONTENTS

Draftsman Civil (AutoCAD)
(6 – Months Course)

Sr. No.	Detail of Topics	Theory Hours	Practical Hours
1.	**Fundamental of Civil Technology**		
	1.1. Building Material and Construction	2	
	1.1.1. Bricks & Tiles		
	1.1.2. Concrete and Concrete Block		
	1.1.3. Structure stone { lime stone, sand stone, granite, marble }		
	1.1.4. Timber		
	1.1.5. Cement		
	1.1.6. Concrete		
	1.1.7. Damp Proofing		
	1.1.8. Steel		
	1.1.9. Stone		
	1.1.10. Marble		
	1.1.11. Glass		
	1.1.12. Pants		
	1.2. Building Components	4	
	1.2.1. Foundation		
	1.2.2. Damp Proof Course		
	1.2.3. Walls		
	1.2.4. Arches & Lintels		
	1.2.5. Floors		
	1.2.6. Roofs		
	1.2.7. Stairs		
	1.2.8. Door & Windows		
	1.3. Water supply & Drainage	1	
	1.3.1. Sanitary Fitting & Fixtures		

	1.3.2. Septic tank, sewer, main hole		
	1.4. Frame Structure	1	
	1.4.1. Types & components of R.C.C structures		
	1.4.2. Steel reinforcement		
	1.5. Measurement System	1	5
	1.5.1. Foot-Lb System & Metric System		
	1.5.2. Conversions of Foot Ib System to Metric System and vice versa		
	1.5.3. Multiples and parts of units.		
	1.5.4. Exercise to solve problems regarding conversion, additions, multiplication and division of measurements		
	1.6. Areas		
	1.6.1. Area of rectilinear plane figures (Square, rectangle, triangle and Rhombus etc.) and circle, segment, sector etc.	2	
	1.6.2. Practice in calculating areas of plane geometrical figures		4
	1.6.3. Practice in calculating areas of composed plane figures		4
	1.6.4. Practice in calculating covered area of building from working drawings.		10
	1.7. Volume	2	7
	1.7.1. Volume of solid figures.		
	1.7.2. Surface area of solid geometrical figures.		
	1.7.3. Quantity of liquid in container.		
	1.7.4. Practice in calculating volume and surface area of solid geometrical &		

	composed figures.		
2.	**Engineering Drawing**		
	2.1. Foundations, Roofs, and Fire places	2	
	2.1.1 Will Foundation		
	2.1.2 Super Structure		
	2.1.3 Plinth		
	2.1.4 D.P.C		
	2.1.5 Walls		
	2.1.6 Floors		
	2.1.7 Roofs		
	2.1.8 Flat Roofs		
	2.1.9 Fire Places		
	2.1.10 Cooking Range		
	2.2. General Principles of Engineering Drawing	2	
	2.2.1. Importance of Drawing in Construction		
	2.2.2. Drawing instruments and their uses		8
	2.2.3. Introduction to title blocks and title strips		4
	2.2.4. Lettering		
	2.2.5. Practice of free hand lettering in vertical and inclined style in single stroke		
	2.2.6. Practice to draw title strip or block		
	2.2.7. Types of lines		
	2.2.8. Symbols and conventions		4
	2.2.9. Practice in drawing different types of lines, symbol of material and conventions		4
	2.2.10. Scales, kinds & uses		

		2.2.11. Practice in constructions of different types and pattern of scales used in Civil Engineering, Architectural Engineering		
		2.2.12. Free hand sketching		
		2.2.13. Practice in making proportional free hand sketches of different objects such as, Rectangle, square, circle triangle, brick and different block etc.		8
	2.3.	**Geometrical Construction**	1	8
		2.3.1. Methods of construction of plane geometrical figures such as triangle polygon, ellipse, parabola & circle etc.		
	2.4.	**Orthographic Projections**		
		2.4.1. Basic principles of 1st & 3rd angle projections.	2	
		2.4.2. Instruction to draw three views of different solid blocks.		
		2.4.3. Section & sectional view		
		2.4.4. Practice in drawing orthographic views of different wooden blocks etc.		12 4 4
		2.4.5. Practice in completion of missing views when two views are given (orthographic projections)		
		2.4.6. Practice in drawing full sectional views of hollow concrete block.		
	2.5.	**Stair**	2	4
		2.5.1 Introduction		

	2.5.2 Technical Terms		4
	2.5.3 Information Regard to Stairs		
	2.5.4 Types of Stairs		
	2.5.5 Stairs of Different Materials		
	2.6. Dimensioning	1	
	2.6.1. Definition & Types of dimension		4
	2.6.2. Rules and procedures for dimensioning		
	2.6.3. Practice to mark / labels dimension in different objects.		
	2.7. Pictorial Drawing	1	
	2.7.1. Types: isometric and oblique, perspective drawings		
	2.7.2. Axis, angle & scale		
	2.7.3. Practice to draw isometric views of different wooden blocks and first three steps of stair etc.		8 4 6
	2.7.4. Practice to draw obliges view prisms.		
	2.7.5. Practice to draw one and two point perspective view of wooden blocks		
	2.8. Building Drawing	2	
	2.8.1. Symbols & term used		
	2.8.2. Plan, elevation, section and relationship between them.		
	2.8.3. Introduction to presentation drawing, sub mission drawing and working drawing		
	2.8.4. Introduction to plans including in a set of working drawing		
	2.8.5. Practice to draw symbols used in		8

	building drawing including symbols for water supply, sanitary and electric installation & fixtures.		
	2.8.6. Practice to draw cross section of wall showing foundation, plinth, floor lintel, sunshade and roof details.		4
	2.8.7. Practice in drawing plan, elevation & section of single room and a room with verandah.		12
	2.8.8. Preparing detail plan, elevation & section of single story residence (two rooms, verandah, bath and kitchen etc.)		12
	2.8.9. Preparing foundations layout plan single story residence.(above motioned single story residence)		4
	2.8.10. Practice to draw plan and section of open well stair.		12
	2.8.11. Practice to show water supply & sanitary arrangement in single story residence		12
	2.8.12. Preparing roof drainage plan		3
	2.9. Wooden Floors		
	2.9.1 Introduction	1	
	2.9.2 Ground Timber Floor		
	2.9.3 Wooden Upper Floors		
	2.10. Frame Structure Building		20
	2.10.1. Components of frame structure	1	
	2.10.2. Necessary data for preparing detailed drawing of small concrete		

	structure building 2.10.3. Preparing detailed drawings for a frame structure commercial building (two story) showing site plan, foundation plan, floor plans, elevation, sections construction details and structural plan & section. **2.11. Drawings of Communication Works** 2.11.1. X-Section of urban and Rural roads 2.11.2. Road culvert & bridges 2.11.3. Study and interpretations of detailed drawings pf RCC deck slab bridge 2.11.4. Preparing detailed drawings for small slab culvert.	1	12
3.	**Computer Applications** **3.1. Introduction to Computer** 3.1.1. What is computer? 3.1.2. Classification of personal computer 3.1.3. Characteristics of personal computer 3.1.4. Hardware & Software 3.1.5. Input & Output Devices 3.1.6. Storage Devices **3.2. Windows Operating System** 3.2.1. Windows Screen Elements 3.2.2. Windows Installation Procedure 3.2.3. Using mouse in windows 3.2.4. Using keyboard in windows	2 3	

	3.2.5. Windows Desktop 3.2.5.1. Icon 3.2.5.2. Button 3.2.5.3. Taskbar 3.2.5.4. Start button & start menu 3.2.5.5. Changing desktop background 3.2.5.6. Using screen saver 3.2.5.7. My documents icon 3.2.5.8. The recycle bin 3.2.5.9. Deleting files or folder 3.2.5.10. Restoring files or folders 3.2.5.11. My computer Icon 3.2.5.12. Windows Explorer		5
	3.2.6. **Files & Folder** 3.2.6.1. Managing files & folders 3.2.6.2. Clipboard 3.2.6.3. Creating Folders 3.2.6.4. Selecting Files & Folders 3.2.6.5. Copying and moving files & folders	2	5
	3.2.7. **Components of Application Windows** 3.2.7.1. Title bar 3.2.7.2. Control Icon 3.2.7.3. Status bar 3.2.7.4. Scroll bar 3.2.7.5. Menu bar 3.2.7.6. Dialog box	1	5
	3.2.8. **Windows Skills** 3.2.8.1. Practice to copy a file or	3	5

			folder to floppy disk	
		3.2.8.2.	Practice to send files to another place quickly	5
		3.2.8.3.	Practice to add a destination to the send to menu	5
		3.2.8.4.	Practice to create a shortcut in a folder	5
		3.2.8.5.	Practice to create a new folder	5
		3.2.8.6.	Practice to change the name of the files or folder	5
		3.2.8.7.	Practice to delete a files or folders	5
		3.2.8.8.	Practice to remove items permanently when you delete them	5
		3.2.8.9.	Practice to change the storage capacity of the recycle bin	5
		3.2.8.10.	Practice to create a short cut in a folder	5
		3.2.8.11.	Practice to make a copy of floppy disk	5
		3.2.8.12.	Practice to copy the windows or screen contents	5
		3.2.8.13.	Practice to hide files and folders	5
		3.2.8.14.	Practice to display hidden files and folders	5

	3.2.8.15. Practice to display hidden files and folder		5
	3.2.8.16. Practice to make a copy of a flash drive		5
	3.2.8.17. Practice to make a copy of CD on computer		5
	3.2.8.18. Practice to write a CD		5
	3.2.8.19. Practice to Install Windows		5
4.	**AutoCAD**		
	4.1. Learning the Tools of the Trade	4	8
	4.2. Introduction & Use		
	4.2.1. Introduction about software		
	4.2.2. Introduction about graphic user interface		
	4.2.3. Introduction about Screen		6
	4.2.4. Introduction about menu bar		6
	4.2.5. Introduction about tool bars		6
	4.2.6. Units & scales		6
	4.2.7. Drawing objects		6
	4.2.8. Modifying objects		6
	4.2.9. Dimension		6
	4.2.10. Boundary Hatch Enhancement		
	4.2.11. Revolved Solids		
	4.2.12. Revolved Surfaces		
	4.2.13. Creating First Drawing		
	4.2.14. Editing Technique		
	4.2.15. Adding Text to Drawing		
	4.2.16. Working with Raster Images		
	4.2.17. Solid Fills		
	4.2.18. Printing and Plotting Techniques		
	4.3. Geometric figures and basic drawing	2	28

		work		
		4.3.1. Practice to draw geometric figures		
		4.3.2. Practice to take offset		
		4.3.3. Practice to copy the figure		
		4.3.4. Practice to extended a line		
		4.3.5. Practice to trim the lines		
		4.3.6. Practice to mirror the object and text		
		4.3.7. Practice to chamfer the lines		
		4.3.8. Practice to fillet the corners		
	4.4.	**Single Room Drawing**	2	14
		4.4.1. Instruction to draw a single bed room		
		4.4.2. Instruction to draw single bed room with dress, bath verandah, kitchen, steps and flower beds		
		4.4.3. Instruction to hatch the objects in 2D views		
		4.4.4. Instruction to draw trees and bushes in 2D view		
		4.4.5. Practice to draw a single bed room		
		4.4.5.1. Plan		
		4.4.5.2. Elevation		
		4.4.5.3. Section		
		4.4.6. Practice to draw a single storey house having one bedroom		
		4.4.6.1. Plan		
		4.4.6.2. Elevation		
		4.4.6.3. Section		
	4.5.	**Single Story Building**	1	18
		4.5.1. Instruction to draw a plan of single		

	story building having a plot size from ten Marla to one Kanal		
	4.5.2. Practice to draw plans section and elevations of single story residential building		
	4.6. Design Center	1	5
	4.6.1. Set the furniture for interior setting of the different units of the house		
	4.7. Concepts of 3D views	1	
	4.7.1. Draw isometric view of geometric figures		6
	4.7.2. Draw perspective view of geometric figures		
	4.7.3. Hatch in 3D View		
	4.7.4. Make a block and insert it		
	4.8. Text & Dimensions	1	16
	4.8.1. Label text in 2D view		
	4.8.2. Label text in 3D view		
	4.8.3. Take Dimensions in 2D View		
	4.8.4. Take Dimensions in 3D View		
	4.9. Rendering	1	16
	4.9.1. Rendering Types		
	4.9.2. All about shadows		
	4.9.3. Adding Sun Light		
	4.9.4. Point Light		
	4.9.5. Spot Light		
	4.9.6. Ambient Light		
	4.10. Practical Tasks (Double Storey Building)		18
	4.10.1. Draw detailed drawings for a ten Marla double storey residential building	1	

	4.10.1.1. Ground Floor Plan 4.10.1.2. First Floor Plan 4.10.1.3. Elevation 4.10.1.4. Section 4.10.1.5. Wall-Section		
	4.11. Practical Task (Draw 3D view of the following) 4.11.1.1. Office Chair 4.11.1.2. Office Table and Table Lamp 4.11.1.3. Door 4.11.1.4. Balcony 4.11.1.5. Rostrum 4.11.1.6. Projections 4.11.1.7. Center Table 4.11.1.8. Stool 4.11.1.9. Revolving Chair 4.11.1.10. Bedside Rack	1	18
	4.12. Kitchen in 3D View 4.12.1. Show detail of kitchen in 3D (Isometric & Perspective view) also show the flower pots, climbers trailers & flooring	1	10
	4.13. Bathrooms in 3D View 4.13.1. Show detail of bath room in 3d (Isometric & perspective view) also show the flower pots, climbers, trailers & flooring	1	10
	4.14. Children Bed Room in 3D view 4.14.1. Show detail of children bed room in 3D view (Isometric & perspective	1	14

	view) also show the flower pots, climbers, trailers & flooring		
	4.15. Stair Cases		14
	4.15.1. Draw 2D & 3D view of the stair and lounge, attach material, show human figures and render it	1	
	4.16. Terrace and Railing in 3D View		10
	4.16.1. Draw 2D & 3D view of terrace and railing, attach material and render it	1	
	4.17. Submission Drawing	1	22
	4.17.1. Prepare a submission drawing for a residential building		
	4.18. Presentation Drawing	1	14
	4.18.1. Prepare presentation drawing for a residential building		
	4.19. Perspective View	1	
	4.19.1. Draw perspective view of building showing flat roof.		22
	4.19.2. Draw perspective view of a building showing sloppy roof		22
	4.20. Final Project (Residential Building)		44
	4.20.1. Draw plan of double story residential building, assigning color, layer, line type and line weight having a plot of minimum one kanal		
	4.20.2. Draw Elevation of double story residential building, having a plot of minimum one kanal as mentioned above		
	4.20.3. Draw Section of double story residential building, having a plot of		

	minimum one kanal as mentioned above 4.20.4. Prepare Submission Drawing 4.20.5. Draw Perspective View of double story residential building, having a plot of minimum one kanal as mentioned above 4.20.6. Draw Plumbing Plan 4.20.7. Draw Electrification Plan 4.20.8. Draw Water Supply and Sewerage plan 4.20.9. Draw Site & Location Plan 4.20.10. Prepare Land Escape Plan 4.20.11. Draw refrigeration and air conditioning plan 4.20.12. Isometric View of Inclined Wall 4.20.13. Perspective View (Flat Roof) 4.20.14. Perspective View (Slopping Roofs)		
Total		**60**	**680**

LIST OF TOOLS/ MACHINERY / EQUIPMENT
(FOR A CLASS OF 20 STUDENTS)

1- Drawing Studio

Sr. No.	Name of Tools & Equipment	Quantity
1.	Drafting Machines / Drafting Tables	20 Nos.
2.	Drafting Chairs / Stools	20 Nos.
3.	Architectural Scales	20 Nos.
4.	Set Squares For Drafting Table	20 Nos.
5.	Templates (Furniture Symbols, Electrical Symbols, Plumbing Symbols, Bath Room Fixtures in 1/8”=1’-0” Scale)	20 Nos.
6.	French Curves Set	20 Nos.
7.	Drawing Instrument Box	20 Nos.
8.	Inking Pens 0.2,0.3,0.6	20 Nos.

2-Computer Lab

Sr. No.	Name of Tools & Equipment	Quantity
1.	Main Server Adequately Configured To Support 20 Work	01 No
2.	Work Station along with Wire less Networking	20 Nos.
3.	Plotter	01 No.
4.	Laser Printer	1 No.
5.	Scanner	1No
6.	Multimedia Project	01 No.
7.	UPS	As required
8.	Inkjet Printer (Color)	01 No.

9.	Application Software Auto CAD 2000 /2006 Or Latest	Installed on each system
10.	Computer Table	20 Nos.
11.	Revolving Chairs / Stool	20 Nos.

EMPLOYABILITY OF PASS OUTS

The pass out of this course may find job / employment opportunities in the following areas / sectors:

1. Design Offices Related To Architectural, Civil Engineering,
2. Town Planning And Land Escaping, Mechanical Engineering, Electrical Engineering Consultancy Firms.
3. Construction Companies
4. Self-employment

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
Architecture residential drawing and design	1-Clois E. Kicklighter 2-Ronald J. Baird	South Holland Ulinois The Good heart-Will Company INC Publisher
PM Series Computer Application B.Com Part I	CM Slam	Majed Sons Urdu Bazaar, Lahore.

Help of the Application software , web sites and lecture CD's by

Syed Muhammad Askari G.C.T, Railway Road, Lahore.

MINIMUM QUALIFICATION OF INSTRUCTOR

- DAE (Architecture, Civil Technology) with expertise in AutoCAD plus two-years experience in the relevant field.