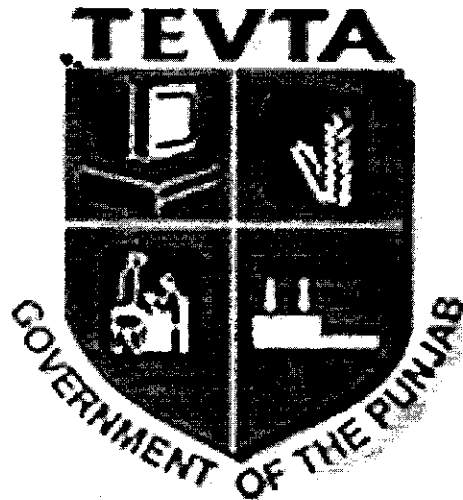
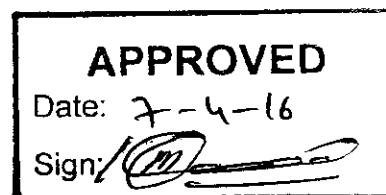


**GOVERNMENT OF THE PUNJAB
TECHNICAL EDUCATION & VOCATIONAL
TRAINING AUTHORITY**



**CURRICULUM FOR
AUTO CAD
(6 – Months Course)
Revised April 2016**



**CURRICULUM SECTION
ACADEMICS DEPARTMENT**

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

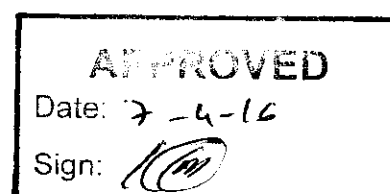
TRAINING OBJECTIVES

In construction industry, the manual drafting been replaced by the computer aided drafting.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 through computer aided drawings / drafting. Keeping in new the demand of new era, there is an urgent need for development of such courses which equipped with the most powerful learning and designing tool, the computer.

This curriculum is developed with a view to produce the workforce to meet the present and future demand of construction sector / industry by introducing computer aided drafting pertaining to the construction field. Hopefully, this demand driven course could improve the quality of delivery in classroom and finally the quality of trainees by equipping them with latest techniques of computer aided designing / drafting.

CURRICULUM SALIENTS

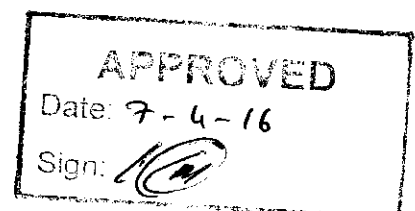
| | | |
|--------------------------|---|-------------------------------|
| Entry Level | : | Matric |
| Total Duration of Course | : | 6 Months |
| Total contact Hours | | 800 Contact Hours |
| Training Methodology | : | Practical 80 % Theory 20 % |
| Medium of Instruction | : | Urdu / English |



SKILL PROFICIENCY DETAILS

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

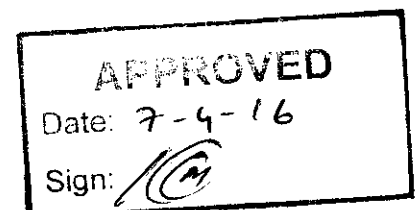
1. Prepare detailed drawings for residential units by manual drafting techniques.
2. Operate Auto CAD software.
3. Create a library of blocks or symbols to be used in drawings and insert them to specified position at different scales and rotations.
4. Create appropriate layers with different color and line types.
5. Produce set of drawings of residential and commercial buildings to enable the building to be approved and constructed.
6. Create views of a particular part of the drawings.
7. Create perspective view of residential and commercial buildings.
8. Prepare detailed drawings of frame structure building and engineering works.



KNOWLEDGE PROFICIENCY DETAILS:

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

1. Describe the health and safety considerations involved in the production of construction drawing.
2. Understand the fundamental principle of projections and plane of projection.
3. Explain the relationship between Plans, Elevation & Section.
4. Identify the various methods of graphical representation and state their uses.
5. Describe the basic components of Civil Engineering structure.
6. Explain how and why perspective drawings are produced.
7. Explain the basic water supply and drainage services arrangement for a building and describe the components of services drawings.
8. Describe the advantages of using Auto CAD in the production of construction drawings.



SCHEME OF STUDIES**AutoCAD
(6 – Months Course)**

| S. No. | Main Topics | Theory Hours | Practical Hours | Total Hours |
|--------------|---|--------------|-----------------|-------------|
| 1 | Fundamental of Engineering drawings | 48 | 120 | 168 |
| 2 | Mensuration | 23 | 33 | 56 |
| 3 | Computer applications | 20 | 81 | 101 |
| 4 | CAD Basics | 15 | 84 | 99 |
| 5 | Architectural & Structural drawing (2D) | 11 | 123 | 134 |
| 6 | 3D modeling | 12 | 81 | 93 |
| 7 | Project | 3 | 39 | 42 |
| 8 | Occupational Health and Safety | 12 | 15 | 27 |
| 9 | Functional English | 16 | 64 | 80 |
| Total | | 160 | 640 | 800 |

APPROVED

Date: 7-4-16

Sign: 

DETAIL OF COURSE CONTENTS**AutoCAD**
(6 – Months Course)

| S. No | Detail of Topics | Theory Hours | Practical Hours |
|--------------|--|---------------------|------------------------|
| 1. | Fundamental of Engineering Drawing 1.1. Introduction 1.1.1. History of engineering drawing 1.1.2. Types of drawings 1.1.3. Drawing tools and instruments 1.1.4. Drawing sheet | 2 | |
| | 1.2. Lettering and lines 1.2.1. Types of lettering 1.2.2. Single stroke lettering styles 1.2.3. Vertical and inclined styles 1.2.4. Types of line: Identification and construction 1.2.5. Selection of pencil 1.2.6. Title strips and title blocks: types and sizes | 1 | 9 |
| | 1.3. Geometrical Drawing 1.3.1. Angle and Types of Angle 1.3.2. Plane Geometrical Figures; types & construction, triangles, quadrilateral and polygons 1.3.3. Circle; sector & segment 1.3.4. Geometrical solids, types 1.3.5. Conical curves; ellipse, parabola, hyperbola and their application and construction | 2 | 12 |

| | | | |
|--|--|---|----|
| | 1.4. Scale 1.4.1. Types and uses 1.4.2. Representative fraction 1.4.3. Graphical Representation of scale 1.4.4. Selection of scale | 1 | 3 |
| | 1.5. Sketching 1.5.1. Techniques in sketching lines 1.5.2. Principles of freehand sketching 1.5.3. Sketching to the scale 1.5.4. Methods of sketching, circle, ellipse, and different geometrical shapes | 1 | 6 |
| | 1.6. Orthographical Projections 1.6.1. Projections: Parallel Projections and Central Projections 1.6.2. Principal planes of projection, dihedral angles and trihedral angles 1.6.3. 1 st Angle Projection System 1.6.4. 3 rd Angle Projection System 1.6.5. Rules to draw orthographical projections | 3 | 18 |
| | 1.7. Sectioning 1.7.1. Purpose of sectional view 1.7.2. Location of cutting plane line; arrow head 1.7.3. Types of sectional views: Full Section, Half Section and Auxiliary views | 1 | 9 |
| | 1.8. Dimensioning 1.8.1. Types of dimensions: dimensions | 2 | 6 |

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|--|--|----|----|
| | <p>lines, symbols and notes</p> <p>1.8.2. Methods of dimensioning: Location Dimensioning system Base-line dimensioning system</p> <p>1.8.3. Rules and procedures for dimensioning.</p> | | |
| | <p>1.9. Pictorial Drawing</p> <p>1.9.1. Definition, Uses & types</p> <p>1.9.2. Isometric Axis, Angle & Scale</p> <p>1.9.3. Method of Construction of Isometric</p> <p>1.9.4. Oblique Projections: Types & Construction</p> <p>1.9.5. Perspective Projections: Varnish point, parallel & angular perspective</p> | 2 | 18 |
| | <p>1.10. Engineering Materials</p> <p>1.10.1. Bricks & Tiles: types,</p> <p>1.10.2. Concrete; ingredients, types and usual ratios</p> <p>1.10.3. Timber; types, seasoning and wood products etc.</p> <p>1.10.4. Ferrous metals; types, structural steel sections, and reinforcing steel.</p> <p>1.10.5. Non- ferrous metals; aluminum properties and uses.</p> <p>1.10.6. Paints, distemper, emulsion; uses</p> <p>1.10.7. Stone; types and uses in building construction</p> <p>1.10.8. Glass; types, & uses</p> | 10 | |

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| | 1.11. Building Structures 1.11.1. Classification of buildings 1.11.2. Structures; Masonry structures, Timber structures, Frame structures and Composite structures. | 1 | |
| | 1.12. Components of Buildings 1.12.1. Foundations; Shallow and deep foundation and functions 1.12.2. Damp Proof course; types & materials. 1.12.3. Masonry work; mortar ,bonds 1.12.4. Walls; types & function. 1.12.5. Arches & lintels; types & function. 1.12.6. Door & windows; types and function. 1.12.7. Stair & stair case; types of stairs. 1.12.8. Floors; types and composition. 1.12.9. Roofs; types and composition. | 10 | |
| | 1.13. Water Supply & Drainage 1.13.1. Basic requirements for residential buildings. 1.13.2. Types of water supply pipes, fittings, fixtures and valves 1.13.3. Sewer pipe; types and jointing 1.13.4. Sanitary Fitting & Fixtures 1.13.5. Septic tank, soakage pit. | 4 | |
| | 1.14. Roads and Road Structures 1.14.1. Roads components & roads geometry 1.14.2. Types of bridges and culverts | 4 | |

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| | 1.14.3. Components of bridges and culverts | | |
| | 1.15. Building Drawing 1.15.1. Common building terms 1.15.2. Building Symbols; materials, and components (including sanitary and electrical installation symbols) 1.15.3. Types of building drawings, submission drawings, working drawings, As-built drawings etc. 1.15.4. Abbreviations used in building drawing | 4 | 39 |
| 2 | Mensuration 2.1. Basic Arithmetic 2.1.1 Additions, subtraction, multiplication and division 2.1.2 Additions, subtraction, multiplication and division of fractions 2.1.3 Additions, subtraction, multiplication and division of decimal numbers 2.1.4 Percentage: change number to percent, change percent to decimal and fraction. 2.1.5 Logarithms | 4 | 6 |
| | 2.2. Units, Significant Figures 2.2.1. Units of Measurements 2.2.2. International System of units 2.2.3. Ft-lb System 2.2.4. Conversion of Units 2.2.5. Significant Figures 2.2.6. Rounding off Number 2.2.7. Use of Scientific Calculator | 4 | 3 |
| | 2.3. Area and Volume | 6 | 18 |

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|---|---|---|----|
| | <p>2.3.1. Area and perimeters of plane geometrical figures.</p> <p>2.3.2. Areas of Irregular shapes; Simpson's rule, middle ordinate rule and trapezoidal rules.</p> <p>2.3.3. Volume and surface area of solid geometrical shapes</p> | | |
| | <p>2.4. Practical Trigonometry</p> <p>2.4.1. Trigonometric ratios.</p> <p>2.4.2. Trigonometric Functions.</p> <p>2.4.3. Solve Right Angle Triangles</p> <p>2.4.4. Pythagoras' Theorem</p> <p>2.4.5. Introduction of co-ordinate geometry; Rectangular coordinates, polar coordinates</p> | 9 | 6 |
| 3 | <p>Computer Application</p> <p>3.1. Introduction to Computer</p> <p>3.1.1 Brief history of Computer</p> <p>3.1.2 Components of computer, Hardware, software,</p> <p>input & output devices, storage devices etc.</p> | 2 | |
| | <p>3.2. Window operating system.</p> <p>3.2.1 Window Interface: Icon, Taskbar, Tool bar</p> <p>Start Menu, My Documents, My computer</p> <p>Recycle bin, Internet Explorer, Dialog box etc.</p> <p>3.2.2 Setting Screen, Date Time, & start menu etc.</p> | 3 | 22 |

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| | <p>3.2.3 Drive, folder & Files; creating, re-naming deleting and searching</p> <p>3.2.4 Installation of window & printer</p> <p>3.2.5 Internet; web browser and browsing, Search Engine & searching information.</p> <p>3.2.6 Email; email account, receive & send emails; attachment with email etc.</p> | | |
| | <p>3.3. Word Processing</p> <p>3.3.1 Introduction to word processing software, Write, edit, format, save & print.</p> <p>3.3.2 M.S Word components; standard toolbar, Status bar, scroll bar, formatting toolbar, Menu bar etc.</p> <p>3.3.3 Managing documents: start, Create, save, Rename, open saved document & printing etc.</p> <p>3.3.4 Editing text: select text, delete, redo, copy, move, cut, paste, check spelling & grammar etc.</p> <p>3.3.5 Formatting documents: changing font style & size, changing text color, bold, italic, underline, setting line spacing, inserting symbols & pictures, adding</p> | 6 | 30 |

| | | | |
|---|--|----|----|
| | bullets & numbering. 3.3.6 Page formatting: setting margins, header & footer, page numbering, page size & orientation 3.3.7 Creating table: Inserting new column & row merging & splitting cells etc. | | |
| | 3.4. M.S Excel 3.4.1 Introduction to MS Excel 3.4.2 MS Excel interface; title bar, Manu bar, Standard tool bar, Formatting tool bar, formula bar, cell, Status bar & Scroll Bar, worksheet and work book etc. 3.4.3 Creating, Navigating and Editing a work sheet; Coping, moving, deleting, saving aligning and wrapping data. 3.4.4 Formatting cells; setting column width & row heights. 3.4.5 Logical of functions 3.4.6 Math functions | 9 | 29 |
| 4 | 4. CAD Basics 4.1. Introduction and merits of auto cad software. 4.2. Introduction of Auto Cad graphic window; Title bar, Tool bar, Manu Bar, Draw Tool bar, Status bar, Modify toolbar, properties tool bar. | 15 | 84 |

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| | <p>4.3. Line types: Construction lines, spline, polyline, multiline & arc.</p> <p>4.4. Coordinate system; Absolute Cartesian coordinate, Relative Cartesian coordinate & polar coordinates.</p> <p>4.5. Drafting setting; Setting model space, setting Grid, Specify Units, Drawing limits, snaps & ortho.</p> <p>4.6. Creating Objects; by 'Draw tool Bar', by using coordinate system, curved objects, point objects (point styles & sizes)</p> <p>4.7. Modifying objects: Copy, erase, cut to clipboard, move, rotate, mirror, array, trim & extend lines, fillet & chamfer edges, offsetting objects, scale & stretch etc.</p> <p>4.8. Dimension; Type & style, creating and editing dimensions.</p> <p>4.9. Regions, boundaries, hatching and gradient</p> <p>4.10. Layers; with color & line type and modification in properties, freeze, lock and off options.</p> <p>4.11. Properties, Hyperlink & Area.</p> <p>4.12. Plotting; setting layout, page setup, paper size, Print area, plot scale & drawing orientation etc.</p> | | |
| 5 | <p>Architectural drafting (2D)</p> <p>5.1 Introduction of plans, elevation & selection</p> <p>5.2 Drafting setup; line type & weight,</p> | 11 | 123 |

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| | <p>layer, color and drawing layout</p> <p>5.3 Instruction to draw plan, elevations & section of a single room</p> <p>5.4 Instruction to draw detailed drawings of residential unit (Plan Elevation, Section & Lay out plan)</p> <p>5.5 Text style and size, symbols and design library(Templates of fixtures and furniture)</p> <p>5.6 Bath and Kitchen interior set up.</p> <p>5.7 Stain Case; Type & Design</p> <p>5.8 Frame Structure; Instruction to draw architectural & structural drawings of a frame structure commercial Building</p> <p>5.9 Cross drainage structure; instruction to draw detailed drawing of a culvert and culvert and two span bridge.</p> | | |
| 6 | <p>3D Modeling</p> <p>6.1 3D solid modeling and mesh</p> <p>6.2 Creating and editing basic 3D solid; rotating, arraying, mirroring, trimming, chamfering, filletting, sectioning and slicing solids and editing faces of solids.</p> <p>6.3 Rendering and its features; lights & shadows</p> <p>6.4 Text and dimensioning in 3D views</p> <p>6.5 Pictorial drawings of 3D objects ; isometric, oblique & perspective views</p> <p>6.6 3D views of building components;</p> | 12 | 81 |

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|---|---|----|----|
| | <p>kitchen, bath & stair, bedroom, balcony & terrace etc.</p> <p>6.8 Perspective view of residential & commercial building; flat roof & sloppy roof type.</p> | | |
| 7 | <p>Project</p> <p>7.1 Introduction of architectural planning for residential building.</p> <p>7.2 Plan a double story residence on a one kanal plot; draw line plans & sketch the elevation & sections.</p> <p>7.3 Preparation of detailed working drawings (architectural construction details, structural and plumbing) and land scape and perspective view etc.</p> | 3 | 39 |
| 8 | <p>Occupational Health & safety.</p> <p>8.1 Hazard at work; Fire Hazards, Heat Stresses, Electrical Hazards, Chemical hazards, Biological Hazards, Mechanical Plant Hazards, Noise and confined space etc.:-</p> <p>8.2 Personal protection equipment:-Types, selection and uses.</p> <p>8.3 Slip, trip and falls: Sources, safety measures and fall protection system</p> <p>8.4 Fire: Basic principles of fire, types of fire, firefighting equipment and their uses</p> <p>8.5 First aid procedures/treatment: Electric Shock, Bleeding, Fracture to bones etc.</p> <p>8.6 Safety signs and signals</p> <p>8.7 Safe storage and handling of materials:</p> | 12 | 15 |

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| | <p>Lifting techniques, mechanical lifting devices</p> <p>8.8 Ergonomics; Body posture, Musculoskeletal injuries, Hazard associated with the repetitive nature of work</p> <p>8.9 Emergency response procedures: Alarms system, means of escape, assembly points, emergency response team.</p> | | |
| Total | | 144 | 576 |

LIST OF PRACTICALS

| S.No | Description |
|-------------|--|
| 1 | Fundamentals of engineering drawings |
| 1.1 | Practice of free hand single stroke lettering |
| 1.2 | Practice to draw different type of lines |
| 1.3 | Perform distribution of drawing sheet and drawing title strip and title blocks |
| 1.4 | Practice to draw inscribed and circumscribed triangles of different sizes |
| 1.5 | Draw regular polygon (hexagon, pentagon and octagon) |
| 1.6 | Construct conic section (ellipse & parabola) by using different methods |
| 1.7 | Practice to construct different scales used in civil engineering |
| 1.8 | Practice of freehand lining of different pattern of lines |
| 1.9 | Practice of freehand proportionate sketching of different, triangles, polygon, circle, ellipse and different objects |
| 1.10 | Practice to complete the missing lines in orthographic views |
| 1.11 | Practice to draw the missing view when two views are given. |
| 1.12 | Practice to draw orthographic views of different wooden blocks. |
| 1.13 | Draw full section front view, side view and top view of wooden block |
| 1.14 | Draw half section front view, side view and top view of wooden block |
| 1.15 | Draw axillary view of typical wooden block having a tapered surface. |
| 1.16 | Practice to mark/label dimensions on different pre-draw orthographic views and objects |
| 1.17 | Practice to draw isometric view from given orthographic views of different objects |
| 1.18 | Practice to draw oblique view of different objects |
| 1.19 | Practice to draw one point and two points perspective view of wooden blocks |
| 1.20 | Practice to draw symbols used in architectural drawings, sanitary and electrification drawings |
| 1.21 | Draw x-section of wall showing foundation, plinth, floor, door, lintel, sunshade and roof details |
| 1.22 | Draw plan, elevation and section of single room with verandah |
| 1.23 | Draw detailed plan, elevation and section of single story one bed residence |
| 1.24 | Prepare foundation lay out plan of single story residence |
| 1.25 | Prepare detailed drawing for a simple framed structure commercial building (site plan, foundation plan, structured plans & detailed floor plans, sections, elevations & constructional details.) |
| 2 | Mensuration |
| 2.1 | Solve problems related to addition, subtraction, multiplication, division of whole numbers, fractions and decimal numbers. |
| 2.2 | Solve problem related to percentage. |

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| 2.3 | Practice to use calculator for addition, subtraction, multiplication, division, square, square root etc. |
| 2.4 | Exercise to solve problems related to conversion, addition, subtraction and multiplication & division of measurements |
| 2.5 | Practice to calculate the are and perimeter of different regular & irregular shaped plot/pieces of land |
| 2.6 | Practice to calculate the volume and surface area of different geometrical shapes |
| 2.7 | Practice to calculate covered area of building from working drawings (5 Marla, 10 Marla, 1 Kanal etc.) |
| 2.8 | Exercise to solve problem related to trigonometric ratios |
| 3 | Computer Application |
| | Window skills |
| 3.1 | Practice to log on/log off, opening start menu, setting time and date, closing program and shutting down etc. |
| 3.2 | Practice to organize icons, deleting icons, re setting/ changing up the theme and wall paper of desktop. |
| 3.3 | Practice to create a new folder, rename the files & folders, copying, moving and deleting a file and folder. |
| 3.4 | Practice to search documents, picture, files and folders. |
| 3.5 | Practice to use recycle bin and windows help |
| 3.6 | Practice to hide files and folders and display hidden files and folders |
| 3.7 | Practice to use flash drive & C.D for copying data |
| 3.8 | Install window and printer |
| 3.9 | Practice to use internet explorer and searching information / website and downloading information into a folder |
| 3.10 | Create an e-mail account and practice to read e-mails & send mails and making attachments. |
| | Word Processing |
| 3.11 | Practice to start M.S word, create new file, enter text, save and open saved file, rename and close the file |
| 3.12 | Practice of editing text/paragraph; type paragraph, select text, delete, cut, copy, paste, undo, redo and insert text etc. |
| 3.13 | Practice of checking spelling and checking of grammar in a text |
| 3.14 | Practice to find any word in the given document and replace them with another word |
| 3.15 | Practice of formatting text i.e. changing font style & style, size of text, text colour and alignment of text, alphabet case, bold and underline. |
| 3.16 | Practice of formatting the paragraph i.e. line spacing, paragraph spacing and indentation, alignment, bullets and numbering |
| 3.17 | Practice of inserting symbols and pictures in a document |
| 3.18 | Practice of page formatting i.e. setting margins, headers and footers, page numbering and page size & orientation |
| 3.19 | Apply the bullets, numbering, insert table and symbols, by typing a |

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| | subjective type and objective type question paper |
| 3.20 | Create table and practice to insert new row and column; merging and splitting cells etc. |
| 3.21 | Develop a weekly time table of a class |
| 3.22 | Develop a schedule of door and windows, showing the type, sizes, material and still height. |
| 3.23 | Prepare curriculum vitae (C.V) and insert picture etc. (develop two CV's) |
| | MS Excel |
| 3.25 | Practice to start MS excel enter data (navigate by using keyboard and mouse) Save a workbook, open a saved workbook, create a new workbook, insert and delete a worksheet etc. |
| 3.26 | Practice to edit data in a worksheet: Copying and moving data, editing aligning etc. |
| 3.27 | Practice to insert column and rows in worksheet and practice to change column width and row height |
| 3.28 | Practice of setting font, margins, print area and printing the work sheet |
| 3.29 | Prepare a spreadsheet and apply sum, product, power functions on row and column |
| 3.30 | Prepare result sheet of a subject at least 20 students and use formula to calculate percentage & grade i.e. s.no. Roll.no. name, obtained marks, percentage and grade. |
| 3.31 | Prepare and save the mark sheet of a candidate apply formula to compute total marks obtained, percentage, grade and pass/fail remarks etc. |
| | |
| 4 | CAD Basics |
| 4.1 | Practice to install Auto cad, create, copy, rename, save & delete files |
| 4.2 | Practice of drafting setting; specifying units, selecting drawing size, setting grids, snaps, ortho & object snaps, setting layout, text style and height etc. |
| 4.3 | Practice to draw construction line, ray, polyline, spline, multi-lines |
| 4.4 | Practice to prepare A4 A3 A2 A1 size typical drawing layout templates |
| 4.5 | Practice to draw simple geometrical shapes by using "Draw Tool Bar" (rectangle, circle, polygon) |
| 4.6 | Practice to apply co-ordinate system (absolute, relative and polar) to draw different objects and shapes by line commands |
| 4.7 | Practice to draw arcs by specifying three points and by using start point and chord length. |
| 4.8 | Practice to draw ellipses by using point & distances and using start and end angles. |
| 4.9 | Practice to use the modify tool bar commands (cut, copy, paste, erase, move, rotate, break, extend and offset etc.) on the already |

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| | drawn objects |
| 4.10 | Draw orthographic views of different wooden blocks. |
| 4.11 | Practice to change the properties of objects |
| 4.12 | Practice to calculate areas & perimeters of different objects, view & plots. |
| 4.13 | Practice of chamfering, filleting, trimming on the already drawn objects. |
| 4.14 | Practice of making mirror and array of the drawn objects. |
| 4.15 | Practice to resize the objects; stretching, scaling and extending etc. |
| 4.16 | Practice to create regions using boundaries and hatch area in different patterns. |
| 4.17 | Create a library of blocks/symbols/templates of fixtures, furniture, features etc. used in civil engineering drawings |
| 4.18 | Practice to use dimension tool bar for creating dimensions & editing dimensions of already drawn objects & orthographic views. |
| 4.19 | Practice to create appropriate layers with different colours for simple objects/plans and edit any layer, line type & line weight etc. |
| 4.20 | Practice of plotting; creating different layout templates, moving or copying plan/objects, selecting page size, plot area, scale and print it. |
| 5 | Architectural & Structural drafting {2D CAD} |
| 5.1 | Draw plan elevation & section of single room with the help of manually developed detailed drawings |
| 5.2 | Draw plan elevation & section of two rooms with verandah with the help of the given line plan. |
| 5.3 | Draw plan elevation and section of simple story residence (Two rooms, bath, kit and verandah) with the help of already manually developed detailed drawing of the same |
| 5.4 | Draw plan elevations & sections of a single story residence unit (two beds) in layer with the help of given line plan and sketches |
| 5.5 | Draw plan elevation and section of double story residential unit (10 Marla) in layers with the help of line plans & sketches |
| 5.6 | Practice to insert symbols of fixtures and furniture from design library in the above drawn plans to specific position at different scales and rotations. |
| 5.7 | Practice to enter text in drawing by using different style and impart text from MS office |
| 5.8 | Draw site plan, location plan for different plots (10 Marla, 1Kanal, 2Kanal) in different localities |
| 5.9 | Draw land scape plan for plots of different sizes by using hatching command etc. |
| 5.10 | Practice to calculate the plot areas, covered areas, open areas etc. of already developed CAD plans |
| 5.11 | Draw foundation layout plans for single story residential units by using the plans developed in previous practicals (one bed, two bed and double story residential unit.) |

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| 5.12 | Draw structural drawings and details (R.C.C roofs slab, lintel, sunshade & beams) for a residential unit with the help of design sketches. |
| 5.13 | Practice to show the water supply and sanitary piping and fixtures in the plans of residential units that already developed in previous practicals (one bed, two bed and double story residential units) |
| 5.14 | Draw detail of manholes (Circular, Square) inspection chamber and septic tank for a residential unit. |
| 5.15 | Practice to show the different style of kitchen and baths (plan and sectional view). |
| 5.16 | Develop the foundation plan, floor plan, sections, structural details (reinforcement for a column & base, slab & beam) for a two story R.C.C frame structure, with the help of structural design sketches and setting layout for plotting. |
| 5.17 | Develop detailed drawing of a single span slab culvert with the help of manual drawings. |
| 5.18 | Develop detailed drawing of a two span deck slab bridge with the given manual drawing set and setting layout for plotting. |
| 6 | 3D Modeling |
| 6.1 | Create 3D solids, such as box, cone, cylinder, sphere, torus, pyramid, wedges and extrude solids etc. |
| 6.2 | Practice to apply the editing commands to rotate, extrude, mirror, trim, chamfer, fillet and slicing the already created 3D solids. |
| 6.3 | Practice to draw isometric view of different solid object by using 3D commands |
| 6.4 | Practice to use rendered tool bar for adding light, colour, materials, to the surface of 3D objects. |
| 6.5 | Practice to draw oblique view of different solid objects using 3D commands |
| 6.6 | Practice to draw perspective view of different solid objects using 3D commands |
| 6.7 | Practice to draw 3D rendered view of the following; office chair, table, rostrum, round table, book rack, bed and sofa etc. |
| 6.8 | Draw 2D and 3D views of different types of stairs (straight flight, half turn, dog legged and bifurcating and spiral stairs) and rendered. |
| 6.9 | Draw 3D solid views of balcony, terrace, projection and domes. |
| 6.10 | Show the details of a typical bath, kitchen & bed in 3D |
| 6.11 | Draw perspective view of a residential single story building having sloppy roof. |
| 6.12 | Draw perspective view of a double story residential building; flat roof and sloppy roof. |
| 6.13 | Draw perspective view of a small commercial building. |
| 7 | PROJECT |
| 7.1 | Prepare detailed plans and elevations of residential building (1Kanal plot) with the help of planned sketches. |
| 7.2 | Develop sections and construction details for stair case, kitchen, |

| | |
|-----|---|
| | bath and foundation etc. |
| 7.3 | Draw plumbing plan (water supply & sewage) & details of manhole, sewer line and septic tank etc. |
| 7.4 | Draw the structural drawings (R.C.C slabs, beams, lintel) with the help of structural design sketches |
| 7.5 | Draw foundation plan & land escape plan |
| 7.6 | Develop perspective views |
| 7.7 | Arrange the drawings, setting layout for plotting and get print to an appropriate scale. |
| 8 | Occupational Health and Safety |
| 8.1 | Perform fire fighting for different types of fire in simulated condition (wood, paper, oil, and electrical fire etc.) by using correct type of fire extinguisher & technique. |
| 8.2 | Carry out the basic first aid treatment in simulated condition for electrical shock including cardio pulmonary resuscitation (CPR). |
| 8.3 | Carry out the basic first aid treatment in simulated condition for bleeding and breaks to bones |
| 8.4 | Carry out manual handling of various loads according to the standard Ergonomic procedures. |
| 8.5 | Participate in emergency response drill; firefighting; raising alarm, assembly and escape of occupants in simulated condition. |

SCHEME OF STUDIES **Functional English**

| S.No | Main Topics | Theory Hours | Practical Hours | Total Hours |
|--------------|---|--------------|-----------------|-------------|
| 1. | Use of past indefinite tense | 2 | 6 | 8 |
| 2. | Use of 'was' 'were' ' questions and negatives | 3 | 6 | 8 |
| 3. | Explaining a situations/ analysis | 2 | 6 | 8 |
| 4. | Communication in writing | 2 | 6 | 8 |
| 5. | Comprehension | 1 | 6 | 7 |
| 6. | Application/ C.V. | 1 | 6 | 7 |
| 7. | Dialogues | 1 | 9 | 10 |
| 8. | Understand vocabulary | 1 | 3 | 4 |
| 9. | Writing complaints/ answers to complaints | 1 | 9 | 10 |
| 10. | Interviews | 2 | 7 | 10 |
| Total | | 16 | 64 | 80 |

DETAIL OF COURSE CONTENTS**Functional English**

| S. No | Detail of Topics | Theory Hours | Practical Hours |
|--------------|--|---------------------|------------------------|
| 1 | Use of past indefinite tense 1.1 Describing past events | 2 | 6 |
| 2 | Use of 'was' 'were' ' questions and negatives | 2 | 6 |
| 3 | Explaining a situations/ analysis 3.1 Making a plan 3.2 Visiting factory area 3.3 Giving justifications | 2 | 6 |
| 4 | Communication in writing 4.1 Asking for list of stationery items 4.2 Submitting report of performance of team of technicians 4.3 Submitting joining report | 2 | 6 |
| 5 | Comprehension: practice sets | 2 | 6 |
| 6 | Job application/C.V. | 1 | 6 |
| 7 | Dialogues | 1 | 9 |
| 8 | Understand vocabulary | 1 | 3 |
| 9 | Writing complaints/ answers to complaints | 1 | 9 |
| 10 | Interviews | 2 | 7 |
| Total | | 16 | 64 |

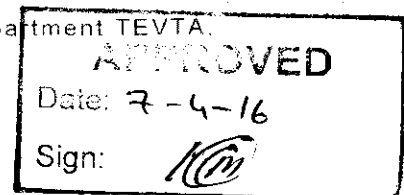
APPROVED

Date: 7-4-16

Sign: 

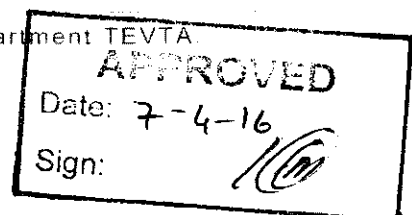
LIST OF PRACTICALS
Functional English

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



LIST OF LABS

- Computer Lab

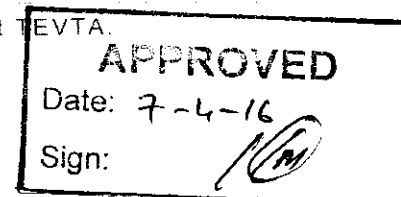


LIST OF TOOLS/ MACHINERY / EQUIPMENT
(For a class of 25 students)

| | |
|---------------------------|-----------------|
| Name of Trade | Auto CAD |
| Duration of Course | 6-Months |

| S. No. | Name of Tools & Equipment | Quantity |
|---------------|---|--------------------------|
| 1. | Main Server Adequately Configured To Support 25 Work Stations | 01 No |
| 2. | Work Stations along with Networking | 25 Nos. |
| 3. | Application Software Auto CAD 2000 /2006 Or Latest | Installed on each system |
| 4. | Plotter | 01 No. |
| 5. | Laser Printer | 1 No. |
| 6. | Inkjet Printer (Color) | 01 No. |
| 7. | Scanner | 1No |
| 8. | Multimedia Project | 01 No. |
| 9. | UPS | As required |
| 10. | Computer Table | 25 Nos. |
| 11. | Revolving Chairs / Stool | 25 Nos. |
| 12. | Architectural Scales | 25 Nos. |
| 13. | Set Squares For Drafting Table | 25 Nos. |
| 14. | Templates (Furniture Symbols, Electrical Symbols, Plumbing Symbols, Bath Room Fixtures in 1/8"=1'-0" Scale) | 25 Nos. |
| 15. | French Curves Set | 25 Nos. |
| 16. | Drawing Instrument Box | 25 Nos. |

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



LIST OF CONSUMABLE MATERIALS**(For a class of 25 students)**

| Sr. No. | Name of Items | Quantity |
|----------------|---------------------------|-----------------|
| 1 | Drawing sheets (A-3) | 500 Nos. |
| 2 | Graph sheets | 50 Nos. |
| 3 | Drawing sheets (A-2 size) | 125 Nos. |
| 4 | Printer papers (A-4) | 5 Rims. |
| 5 | Lead pencils | 100 Nos. |
| 6 | Erasers | 30 Nos. |

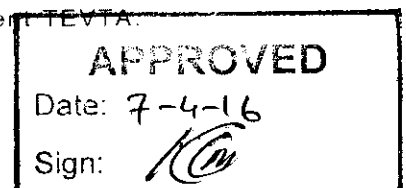
Functional English

| S. No. | Item | Quantity |
|---------------|---------------|--------------------|
| 1. | Stationary | As per requirement |
| 2. | Board Markers | As per requirement |

EMPLOYABILITY OF PASS OUTS

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

1. Design offices related to architectural, Civil engineering.
2. Town planning and land escaping, Mechanical Engineering,
3. Electrical Engineering Consultancy firms.
4. Construction Companies.
5. Self-employment.



MINIMUM QUALIFICATION OF INSTRUCTOR

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

Functional English

- M.A (English)

REFERENCE BOOKS

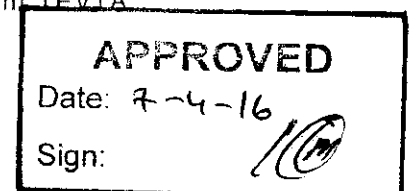
| Title Of Book | Name Of Author | Name Of The Publisher |
|---|---|---|
| Architectural Drawing And Light Construction | Edward J. Muller | Prentice-Hall INC. |
| Auto CAD 2000 | David Frey | BPS Publications B-14 Connaught place, New Delhi-110001 |
| Architecture residential drawing and design | 1-Clois E. Kicklighter 2-Ronald J. Baird | South Holland Ulinois The Good heart-Will Company INC Publisher |
| Engineering Drawings | N.D. Bhatt and V.M. Panchal | Prabat Publishers, Delhi |

Functional English

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

LIST OF TRADE RELATED JARGON

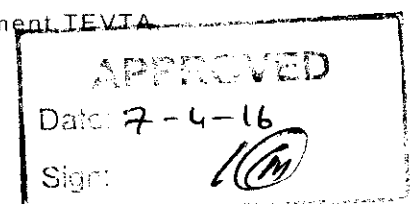
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|-----------------------|--|
| Arrowhead | The part of a dimension or leader which points to an object or extension line. |
| Attribute | Information or data about a drawing object which can be hidden or appear in the drawing as text. |
| Bezier curve | 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. |



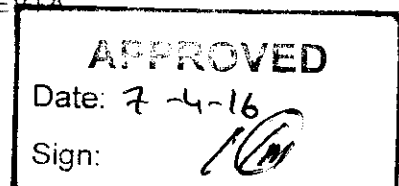
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| Curve | A complex entity created by the definition of endpoints of spline curve sections. |
| Datum | A temporary coordinate point set by the user which can be used as a snap point or reference point when drawing. |
| Dimension line | A line, usually 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 object. | 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. |
| Leader line | The line portion of a <u>leader</u> connecting the shoulder to an <u>arrowhead</u> . |
| 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 <u>coordinates</u> 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. |

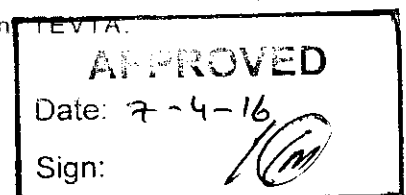
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| Origin | The point in a drawing with the x,y <u>coordinates</u> of 0,0. |
| Ortho | Short for orthogonal. |
| Pan | The process of altering the drawing view by moving the viewpoint laterally relative to the drawing. |
| Polygon | A complex object 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 are built. | The simplest drawing objects from which all objects |
| 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 <u>coordinates</u> which when <u>manually entered</u> 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. |



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| 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 command. | One or more objects selected for action with a single |
| 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 current <u>grid</u> . |
| 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 one point. | A line which intersects a circle, ellipse or arc at only |
| Toggle | A drawing control or setting which is either on or off. |
| Units program. | Units of measure represented by numbers in a CAD |
| Vertex | A point defining the junction of a segment within <u>polyline</u> or <u>polygon</u> . |
| View | The graphical representation of the geometry stored in the drawing database which appears in the drawing window or viewport. |



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|----------|--|
| 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. |



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 |

