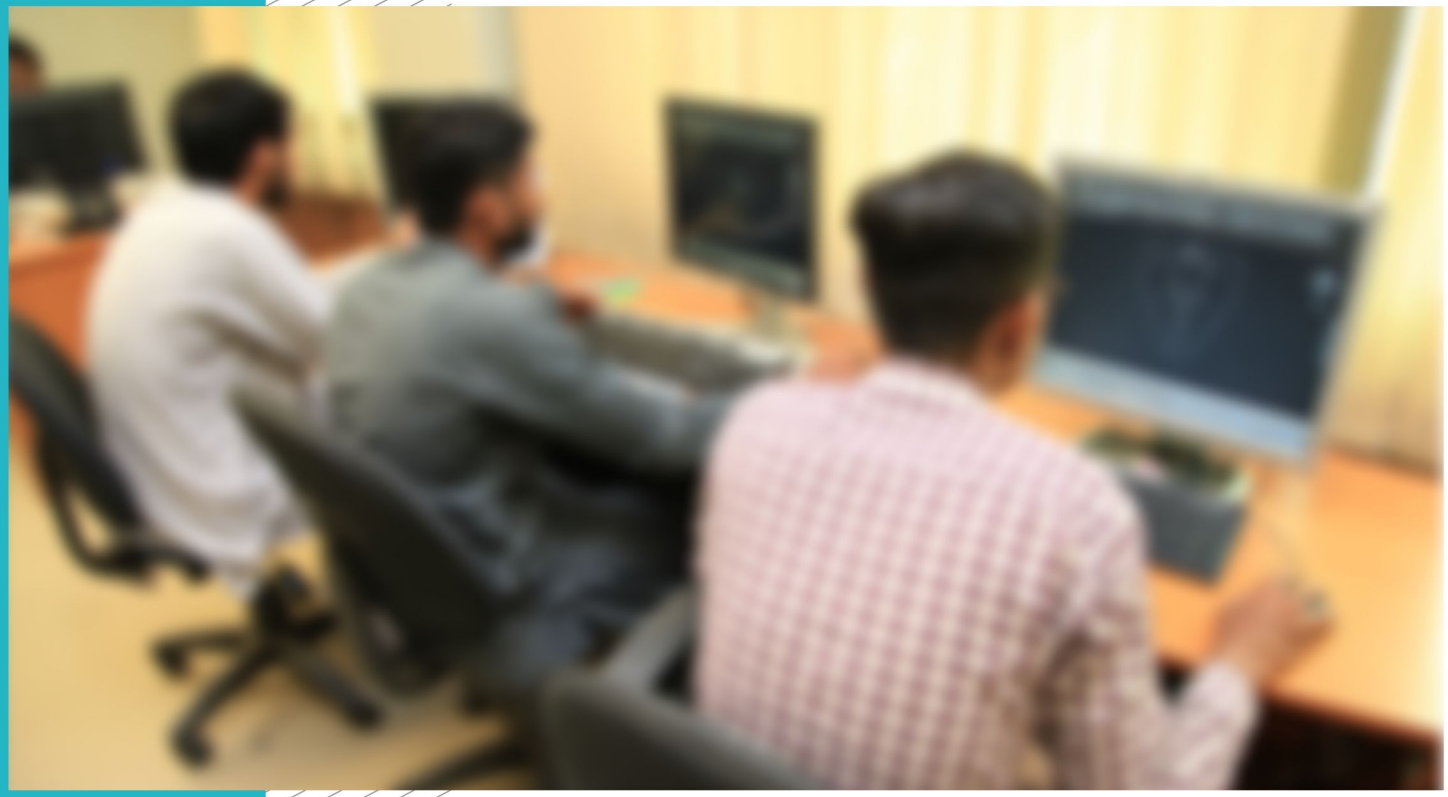
AUTOCAD



COMPETENCY STANDARDS

National Vocational Certificate Level 3

Version 1 - July 2013

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Competency Standards: AutoCAD

Module A: Exhibit duties and rights at the workplace:

Overview: The competency standard is designed to develop code of ethics and professional conduct, improve planning capabilities, and enhance awareness to provision of applicable territorial business / employment related rights at workplace.

Competency Unit	Performance Criteria	Knowledge and Understanding
A1: Demonstrate Ethics and Professional Conduct	**Trainee will be able to:** **P1**. Maintain the mandatory standard for Responsibility, Respect, Fairness, and Honesty against the applicable territorial laws.	**Trainee will be able to:** **KI.** Take ownership for the decisions/actions s/he makes or fails to make and their consequences. (Role Play) **K2.** Highlight high regard for resources entrusted to him/her. Including subordinates, tangible assets (equipment's), company profile. **K3.** Make decisions and act impartially/objectively free from self-interest. (Quantified Self-assessment can be performed e.g. case studies.) Areas like conflict of interest **K4.** Explain the truth and act in truthful manner in conduct/communication. Daily attendance enrolment on register.

A2: **Plan business-process activities**	**Trainee will be able to:** **P1.** Plan tasks, their scheduling, define milestones, and learn optimal utilization of resources.	**Trainee will be able to:** **K1.** Provide due assistance to in-line manager e.g. coordinating recurring meetings, intimate resource availability, create and keep documentations, validate applicable company defined standards. **K2.** Describe activities, e.g. Apply specific life cycle methodologies – (Requirement gathering, design solution, prototype, testing, documentations) **K3.** Estimate time, e.g. hour's calculations for an activity; consider calendar year official leaves, company working timings. **K4.** Breakdown work, divide module in smaller and more manageable components e.g.; testing a drawing may have components like interface, coordinates, and render cases. **K5.** Level resource due to work load, e.g.; calculations of leisure hours of a worker.
A3: **Create awareness about rights**	**Trainee will be able to:** **P1.** Accurately recognize the aspirational requirements of human rights in employment context.	**Trainee will be able to:** **K1.** List the policies, rules/regulations that govern the work and workplace. **K2.** Report illegal conduct or illegitimate action to concerned management. **K3.** Protect propriety or confidential information. (Intellectual Property Rights, Copy Rights).

Module B. Perform AutoCAD 2D Fundamentals

Overview: The competency standard is designed to provide knowledge and skills to create geometric entities quickly and accurately. In learning to use a CAD system, lines and circles are the first two, and perhaps the most important two, geometric entities that one should master the skills of creating and modifying.

Competency Unit	Performance Criteria	Knowledge and Understanding
B1. **Control display in drawings**	**Trainee will be able to:** **P1.** Create AutoCAD drawing files. **P2.** Save AutoCAD drawing files in proper format. **P3.** Operate the AutoCAD visual reference commands Including: • Zoom Extent • Drawing LIMITS • Status Bar • GRID Display • PAN Real time	**Trainee will be able to:** **K1.** Describe the quality, condition, or fact of being exact and accurate which is also called Precision **K2.** Identify the different AutoCAD visual reference commands
B2: **Create basic drawings**	**Trainee will be able to:** **P1.** Execute Line commands including: • Format • Units Setup • LINE command • Coordinates • Interactive Input method • SNAP Option • World space	**Trainee will be able to:** **K1.** Recognize the various Line commands

	• User coordinate system • World coordinate system • UCS icon Display **P2.** Use Circle commands Including: • TTR • Relative Coordinate • Coordinate systems • Cartesian coordinate system • Absolute coordinates • Positions • Defining LINE • Close option • CIRCLE command • TTT **P3.** Define Positions using the Basic Entry methods	**K2.** Choose the required Circle command for specific purpose **K3.** Recall the ARC command
B3: **Manipulate objects as desire**	**Trainee will be able to:** **P1.** Identify the ERASE command **P2.** Recognize the AutoCAD Pan Realtime option	**Trainee will be able to:** **K1.** Explain ERASE command **K2.** Describe Selection window

C. Create 3D Interface/Drawings

Overview: The competency standard is designed to explore the basic Three (3) dimensional interfaces with thickness and elevation to visualize the model.

Competency Unit	Performance Criteria	Knowledge and Understanding
C1: **Develop familiarity with 3D Basics interface in AutoCAD**	**The trainee will be able to:** **P1.** Use different options to draw 3D Basic Ribbons, including: • Create • Edit • Draw • Modify • Selection • Coordinates • Layers • Views **P2.** Recognise the steps of executing Pull down menus including: • Home • Render • Insert • Manage • Output • Plug-ins • Online • Express Tools	**The trainee will be able to:** **K1.** Describe how to draw 3D Basic Ribbons using different tools. **K2.** Identify different options of Pulldown menus.

	P3. Execute the steps to apply 3D Modelling panels including: • Modelling • Mesh • Solid • Editing • Draw • Modify • Section, • Coordinates • View • Selection • Layers • Groups **P4.** Identify options 3D Modelling Pull down menus including: • Home • Solid • Surfaces • Mesh • Render • Parametric • Insert • Annotate • View • Manage • Output • Plug-ins • Online Express Tools	**K3.** Recall a good knowledge of 3D Modelling interface (Panels, Pulldown menus). **K4.** Recognize different options 3D Modelling Pulldown menus

	P5. Identify Viewports (-VPORTS command) including: • Pre-set 3D Viewports • Named Views. **P6.** Apply the technique to track the cursor (Steering Wheel) including: • Over wedge as full navigation wheel • View object wheel • Orbit, walk up/down • Rewind and its setting **P7.** Identify Viewpoints including: • VPOINT command (Rotate switch, DDVPOINT command) • PLAN command	**K5.** Remember different Viewport options **K6.** Recognise the different techniques to track the cursor (Steering Wheel) **K7.** Define the Vpoint, DDVpoint and Plan View techniques.
C2: Introduce Thickness and Elevation	**The trainee will be able to:** **P1.** Apply the Thickness command at command prompt with different values or modify general properties of an object **P2.** Execute the “Elev” command at command prompt with different values.	**The trainee will be able to:** **K1.** Describe how to execute the “Thickness” command at command prompt **K2.** Explain how to set the Elevation of object.
C3: Visualise the Model	**The trainee will be able to:** **P1.** Identify different Styles including: • Display of edges	**The trainee will be able to:** **K1.** Define different styles

	• Shading (Visual Styles) in the viewport **P2.** Manage different Styles through: • 2D Wireframe • 3D Wireframe • 3D Hidden • Realistic • Shaded • Shaded with Edges • Shades of Gray • Sketchy • X-Ray **P3.** Apply different visual functions including: • Regenerate a three-dimensional model with hidden lines using HIDE command. • Set the grid with DSETTINGS command.	**K2.** Explain how to Manage different Styles using different options: **K3.** Define different visual functions (hide, grid).

D. Draw Coordinates

Overview: The competency standard is designed to explore the basics of 3D User and Z Cartesian (X, Y, Z) coordinates system.

Competency Unit	Performance Criteria	Knowledge and Understanding
D1: **Explain basic terminologies of Z Coordinates**	**The trainee will be able to:** **P1.** Create 3D Cartesian coordinates against 3D POLY command by specifying start and end points. **P2.** Demonstrate the process to track in Z direction by "OSnap" tracking or F11 key and "Polar" tracking or F10 key. **P3.** Run "move" command to move in Z direction by specifying displacement. **P4.** Recall 3D point filters, e.g. specifying radius of circle command. **P5.** Create 3D spiral using "helix" command by defining number of turns, diameter and height.	**The trainee will be able to:** **K1.** Identify different commonly known terminologies of 3D coordinates **K2.** Describe the tracking and movement in Z direction **K3.** List 3D point filters **K4.** Explain "Helix" function for 3D spiral.
D2: **Define user Coordinates System**	**The trainee will be able to:** **P1.** Conduct orientation session of the user coordinate system (UCS) axes and the location of the current UCS origin with the execution of command "ucsicon". **P2.** Apply "UCS" command with multiple switches including • Face • Named • Object	**The trainee will be able to:** **K1.** Configure User Coordinates System (UCS) properties. **K2.** Explain different functions to UCS.

	• Previous • New • View • World • X/Y/Z. **P3.** Use the UCS toolbar. **P4.** Demonstrate the Plan UCS procedure with “PLAN” command **P5.** Incorporate Dynamic UCS with short keys of Ctrl+D. **P6.** Restore a saved and named UCS with “R” key. **P7.** Explore UCS dialog box using “UCSMAN” command **P8.** Get the visual feedback of the model by Viewcube.	**K3.** Define the UCS toolbar. **K4.** Explain the Plan UCS procedure with “PLAN” command. **K5.** Define Dynamic UCS with short keys. **K6.** Describe how to restore a saved and named UCS. **K7.** Explain UCS dialog box **K8.** How to Generate Viewcube.

E. Draw 3D Orbit, Navigations and Model

Overview: The competency standard is designed to explore the use of 3D orbit for a model, creation of a camera and aspects of 3D model objects in detail.

Competency Unit	Performance Criteria	Knowledge and Understanding
E1: Develop familiarity with 3D Orbit	**The trainee will be able to:** **P1.** Define 3D orbit with the command of • "3DOrbit" for constrained orbit on selected object. • Developing zoom • Pan facility • Projection mode by selecting "Perspective" • Select different visual styles e.g. 3D Hidden, 3D Wireframe, Conceptual, and Realistic. **P2.** Select different visual aids e.g. Compass, Grid and UCS Icon. **P3.** Sets the 3D view while in the orbit command using pre-set views. **P4.** Differentiate between Free and Continuous orbit. Highlight the use of "Esc" key. **P5.** Discover other navigational modes including but not limited to Walk, Fly, Swivel, and Adjust Distance.	**The trainee will be able to:** **K1.** Define the working of 3D Orbit (constrained, free and continuous). **K2.** Explain different projection and navigational modes. **K3.** Explain visual aids and styles.

E2: Perform 3D dimensional navigation	**The trainee will be able to:** **P1.** Deal with the functions of Camera including; • Creation • View • Preview • Properties • Plotting • Display • Adjust • Swivelling • Distance **P2.** Perform parallel projection or perspective views by using a camera and target with the help of "DVIEW" command. **P3.** Simulate walking and flying through a 3D drawing and their setting. **P4.** Execute "ANIPATH" command for animation path.	**The trainee will be able to:** **K1.** Describe how to design and create Camera. **K2.** Plot and adjust the Camera. **K3.** Define parallel projection or perspective views **K4.** Illustrate Walk and Fly settings. **K5.** Describe the different animation paths.
E3: **Operate 3D Objects**	**The trainee will be able to:** **P1.** Create wireframe models by positioning 2D objects anywhere in 3D space i.e. 3D polylines. **P2.** Draw faceted surfaces using a polygonal mesh. **P3.** Combine different simple shapes to create more complex solids by joining or subtracting them or finding their intersecting (over- lapping) volume.	**The trainee will be able to:** **K1.** Explain Structure of Wireframes **K2.** Define the process of application of Surfaces. **K3.** Create Solids.

F. Produce 2D Solid and 3D Faces

Overview: The competency standard is designed to explore the two dimensional solids and three dimensional faces with Edge and invisible Edge.

Competency Unit	Performance Criteria	Knowledge and Understanding
F1: **Draw 2D Solids and 3D Faces**	**The trainee will be able to:** **P1.** Execute "SOLID" command with points to be filled. **P2.** Use "3D FACE" command with points to be filled. **P3.** Create a three-dimensional polyface mesh vertex using "PFACE" command and pick points.	**The trainee will be able to:** **K1.** Explain how to create solid-filled triangles and quadrilaterals. **K2.** Define how to create four sided surface anywhere in 3D space
F2: Draw Edges	**The trainee will be able to:** **P1.** Execute the "EDGE" command with: • Toggle visibility • Hidden edges. **P2.** Entering i or invisible before the first point of an edge makes the edge invisible.	**The trainee will be able to:** **K1.** Explain how to create edges. **K2.** Describe how to draw 3D faces with invisible edges.

G. Insert Surfaces

Overview: The competency standard is designed to study, and analyze basic and complex 3D surfaces.

Competency Unit	Performance Criteria	Knowledge and Understanding
G1: Draw basic 3D surfaces	**The trainee will be able to:** **P1.** Locate Mesh tab from 3D Modelling dropdown option of solids panel • Primitive panel, • Drop-down **P2.** Apply different Mesh primitive options including; • Box • Cone • Cylinder • Pyramid • Sphere • Wedge • Tours **P3.** Apply smoothness and refinement on Meshes (even legacy 2D drawings) with following commands; • MESHSMOOTHMORE • MESHSMOOTHLESS • MESHSMOOTHREFINE **P4.** Add or Remove Mesh Creases using; • MESHCREASE	**The trainee will be able to:** **K1.** Identify different Mesh primitive options. **K2.** Define how to create smooth and refine Meshes. **K3.** Explain the process of editing existing Meshes.

	• MESHUNCREASE **P5.** Enable Mesh editing using; • MESHEXTRUDE • MESHSPLIT (mid point) • MESHMERGE • MESHCAP (close hole) **P6.** Perform convert Meshes using the command: • CONVTOSURFACE	**K4.** Identify how to convert Meshes.
G2: Comprehend complex 3D surfaces	**The trainee will be able to:** **P1.** Develop following Surfaces; • Revolved Surface (REVSURF) • Tabulated Surface (TABSURF) • Ruled Surface (RULESURF) using "Surftab" variables • Edge Surface (EDGESURF) • Plane Surface (PLANESURF) • Extrude Surface (EXTRUDE) **P2.** Create 3D solid or surface in the space between several cross sections: • Using "LOFT" command. • Sweeping a 2D or 3D curve along a path using "SWEEP" command. **P3.** Build Surface Network. **P4.** Create a blend surface between two existing surfaces	**The trainee will be able to:** **K1.** Identify different Surfaces **K2.** Remember how to Edit Surfaces. **K3.** Explain Surface Network.

	using "SURFBLEND" command. **P5.** Create a new surface or cap to close an open edge of an existing surface using "SURFPATCH" command. **P6.** Create a parallel surface at a specified distance from the original surface using "SURFOFFSET" command. **P7.** Edit the existing surfaces through: • Fillet • Trim • Untrim • Extend • Sculpt **P8.** Add and edit control vertices on a NURBS surface or spline using Surface CV edit bar. **P9.** Convert object to NURBS using "CONVTONURBS" command. **P10.** Apply following NURB Vertex Controls; • Surface CV-Show • Surface CV-Hide • Surface CV-Rebuild • Surface CV-Add • Surface CV-Remove **P11.** Distinguish surface analysis via: • Analysis Zebra • Analysis Curvature • Analysis Draft **P12.** Develop Surface associatively.	**K4.** Describe how to apply NURB controls on Surfaces. **K5.** Analyse Surfaces. **K6.** Describe Surface associativity.

H. Develop Solids

Overview: The competency standard is designed to explore the composites of solids and their three dimensional editing.

Competency Unit	Performance Criteria	Knowledge and Understanding
H1: Create Solids	**The trainee will be able to:** **P1.** Launch Solid primitives tab from 3D Modeling dropdown option of solids panel. **P2.** Convert: • An existing line • 2D polyline • Arc • Circle to a solid with a rectangular profile using “Polysolid” command. **P3.** Create unique solid primitives by extruding existing two-dimensional objects using “Extrude” command with • Taper • Path **P4.** Execute following commands on Solids; • Revolve • Sweep • Loft	**The trainee will be able to:** **K1.** Discover Solid primitives. **K2.** Explain Extrude **K3.** Execute commands
H2: Edit 3D Objects	**The trainee will be able to:** **P1.** Convert polylines and circles with thickness to 3D solids	**The trainee will be able to:** **K1.** Explore different methods to convert the

	using “convtosolid” command. **P2.** Edit the existing solids through: • 3D Move • 3D Rotate • 3D Align • 3D Mirror • 3D Rectangular Array • 3D Polar Array **P3.** Extract edges of a 3D object using “_xedges” command. **P4.** Adjust the smoothness of shaded and rendered objects using “FACETRES” command with valid values range. **P5.** Apply “ISOLINES” and “REGEN” command to regenerate the 3D drawing in 3D view.	object/drawing to Solid or Surface. **K2.** Discover how to edit the solids **K3.** Differentiate edge effects or extract edges. **K4.** Explain how to shade and render objects **K5.** Define the method of regenerating the 3D drawing in 3D view

H3: Develop 3D Solid composites	**The trainee will be able to:** **P1.** Apply following Composite functions on solids; • Union • Subtract • Intersect **P2.** Create 3D solid by thickening a surface using "THICKEN" command. **P3.** Highlight 3D solids that overlap using "INTERFERE" command.	**The trainee will be able to:** **K1.** Choose different composite functions applicable to solids **K2.** Define the method to thicken the Solids. **K3.** Find interference on solid objects.

I. Modify Solid Faces

Overview: The competency standard is designed to learn the modification of the 3D solid faces.

Competency Unit	Performance Criteria	Knowledge and Understanding
I1: Modify Solid Faces	**The trainee will be able to:** **P1.** Modify solids face using • Taper • Extrude • Delete • Copy • Colour **P2.** Apply "Imprint" facility on: • Arcs • Circles • Lines • 2D and 3D polylines • Eclipses • Splines • Regions • Bodies • 3D solid object **P3.** Create shell or a hollow thin wall with a specified thickness from 3D solid object.	**The trainee will be able to:** **K1.** Define Solid faces pattern. **K2.** Explain how to run Imprint functionality. **K3.** Identify shell (hollow) effects.
I2: Edit Solids	**The trainee will be able to:** **P1.** Select and manipulate a selected set of more than	**The trainee will be able to:** **K1.** Compare different methods to manipulate sub-

	one sub-object on any number of solids that include more than one type of sub-object using “CTRL” key to hold or toggle. **P2.** Constrain the movement or rotation of a selection set of objects to an axis or a plane using “Move” or “Rotate” command. **P3.** Press or pull bounded areas by pressing and holding CTRL +ALT, or by clicking the Presspull button on the dashboard and then picking the bounded area.	objects in solids. **K2.** Explain how to use Grip tool. **K3.** Describe how to pull and press the bounded areas.

J. Navigate Sections and Merge Flat Objects from 3D Model

Overview: The competency standard is designed to learn the creation of the Section and the Flat objects from three dimensional models.

Competency Unit	Performance Criteria	Knowledge and Understanding
J1: Navigate Section Objects	**The trainee will be able to:** **P1.** Create section object that exposes the interior details of a model created with 3D objects using "SECTIONPLANE" command. **P2.** Apply following options to manipulate Section using Grips: • Base grip • Directional arrow grip • Segment end grip • Menu grip **P3.** Apply following commands on Section: • Erase • Move • Copy • Scale • Rotate • Draw order **P4.** Generate 2D and 3D Sections using option of right click button of mouse. **P5.** Use the intersection of plane and solids to create a region using "Section" command.	**The student will be able to:** **K1.** Define Section plane. **K2.** Learn to deal with Sections. **K3.** Locate how to generate 2D and 3D Sections. **K4.** Define Section commands (Slice, etc.)

	P6. Apply “Slice” command on the 3D object.	
J2: Merge Flat Objects	**The trainee will be able to:** **P1.** Create 2D or “flattened” representation of all 3D objects in the current view using “flatshot’ command. **P2.** Execute “SOLVIEW” command. **P3.** Generate profiles and sections in viewports created with SOLVIEW using “SOLDRAW” command. **P4.** Develop 3D view using UCS. **P5.** Run “SOLPROF” command.	**The student will be able to:** **K1.** Label Flat representation of the 3D objects. **K2.** Recognise 3D view using user coordinate system. **K3.** Discover Configuration of solid profile.

K. Customise Rendering, Materials and Lights

Overview: The competency standard is designed to learn the application of Rendering, its environment and background, and advance features. Use of different Materials and Lights are highlighted for 3D drawings.

Competency Unit	Performance Criteria	Knowledge and Understanding
K1: Execute Rendering	**The trainee will be able to:** **P1.** Create a photorealistic or realistically shaded image of a three- dimensional wireframe or solid model using "Render" commands: • Destination • Quality • Selection • Crop • File. **P2.** Determine the output site that the renderer uses to display the rendered image using "RPERF" command and selecting "Destination". **P3.** Determine the output quality that the renderer uses to display the rendered image using "RPERF" command and selecting "Quality level". **P4.** Controls the parts of the model that gets processed during rendering for following three settings; • View • Crop • Selected	**The trainee will be able to:** **K1.** Explain Render command **K2.** Recognize environmental features.

	P5. Render Cropped window using “RPERF” command and selecting “Procedure”. **P6.** Execute the process to Render to File and Turn off Render to File. **P7.** Use environmental features (Render, Gradient) and background (Solid, Image) to set up atmospheric effects or background images using “RENDERENVIRONMENT” command. **P8.** Apply following Backgrounds: • Single color • Multi-color gradient • Bitmap image using “View” command and later selecting “New”. **P9.** Define settings that affect how materials are handled by the renderer as: • Apply Materials • Texture Filtering • Force 2-Sided **P10.** Execute how renderer control sampling by allocating values to: • Min Samples • Max Samples • Filter Type • Filter Width and Filter Height • Contrast color • Contrast Alpha	**K3.** Explain advance features of Rendering as Sampling, Shadow, Ray Tracing, Illumination, Diagnostic processing. **K4.** Define how effects illuminate scene

	P11. Apply settings that affect how shadows appear in the rendered image in Simple, Sort, or Segments modes. **P12.** Experiment advance features of Rendering as: • Sampling • Shadow • Ray Tracing • Illumination • Diagnostic processing **P13.** Apply settings that affect the shading of a rendered image (Ray tracing) with following options: • Enable • Max Depth • Max Reflection • Max Refraction **P14.** Configure the affects that illuminate scene with following option: • Enable • Radius • Max Depth • Max Reflection • Max Refraction **P14.** Associate with “Diagnostic” and “Processing” features.	**K5.** Explain “Diagnostic” and “Processing” features.
K2: Apply/Configure materials	**The trainee will be able to:**	**The trainee will be able to:**

	P1. Add Material to drawing using “Materials” or “Marbrowseropen” commands. **P2.** Apply Material layers using “MATERIALATTACH” command. **P3.** Create own Material e.g. photo, Shapes. **P4.** Achieve Material mapping of photo or shapes using “MATERIALMAP” command. **P5.** Configure “Cutout Materials” procedure. **P6.** Apply “Bump Map” option of the Material command. **P7.** Execute “_VSMATERIALMODE” command to On/Off Materials.	**K1.** Explore different methods to add/edit Materials to 3D drawings. **K2.** Define how to adjust Material scale/layer. **K3.** Understand the Material mapping (Photo, Shapes). **K4.** Explain how to purge Materials from objects.
K3: Apply Lights	**The trainee will be able to:** **P1.** Turn On/Off the default Lighting using “DEFAULTLIGHTING” command. **P2.** Execute command “POINTLIGHT” that radiates light in all directions from its location. **P3.** Execute command “SPOTLIGHT” that emits a directional cone of light. **P4.** Modify Lights in a drawing using “LIGHTLIST” command. **P5.** Customize Photometric: • Light energy	**The trainee will be able to:** **K1.** Categorise point and spot Lights. **K2.** Understand Lights tool palette.

	• Light for lighting units • Luminaries • Weblight • Halogen effect • Candela intensity, etc. **P6.** Apply the available functionality of Lights tool palette by pressing CTRL+3. SUNPROPERTIES' command. **P7.** Display uniform parallel light rays in one direction only using "DISTANTLIGHT" command and mentioning from and to points. **P8.** Incorporate natural light based on climate into the drawing by specifying the latitude and longitude of a location for the sunlight using "GEOGRAPHICLOCATION" command. **P9.** Adjust the Sun properties using the "SUNPROPERTIES" command	**K3.** Describe geographic location settings for a particular object. **K4.** Observe how to handle the Sun properties for Light issues.

List of Tools and equipment

Documents, policies and guidelines
(Anticipated Class size: 20 trainees/students, it may vary)

20 copies per class	Text book(s) for this course
20 copies per class	Reference book(s) for this course
20 copies per class	Syllabus for this course
1 class set	Bio-Sketch of Trainer
1 class set	Copies of job advertisements extract
1 class set	Information on sources of Knowledge Management
Contact details for colleagues, supervisor	

Tools and Equipment
(Class size: 20 trainees/students)

1 set **1 set** **1 set** **1 set**	Fire equipment including the provision of fire extinguishers Alarm systems Emergency lighting Fire safety and exit signs.
20 **1** **1** **1** **1**	Computers Scanner Printer Multimedia Projector Internet Connection
On each computer	Software • Microsoft® Office (any version)- Enterprise Edition • Microsoft® Windows 8 or above • AutoDesk AutoCAD 2013 or above version/release

List of consumables

- Notebooks
- CDs Rewriteable
- Photocopy Papers
- Ball pens
- Pencils
- Erasers
- Sharpeners
- Board Markers
- Plastic files
- Flip chart papers
- Pin-board pins
- Whiteboard
- Whiteboard Eraser
- Paper knifes
- Glue sticks
- Paper clips
- Scissors
- Punching machines

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