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| Title | **Apply computer aided design/ drafting** |
| Level | **2** | **Credits** | **27** |

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| Purpose | This Competency Standard identifies the competencies required to apply Computer Aided Design/drafting at workplace by an architect in accordance with the organization’s approved guidelines and procedures. You will be expected to Apply Auto-CAD fundamentals, Apply CAD draw tools to make a sketch, Apply Auto CAD modify tools, Apply layer, text and dimension tools, Build and use library of components (blocks), Create working set of drawings and submission drawing, Apply plotting/printing to design and Create 3D model (presentation) of architect’s concept at workplace. Your underpinning knowledge regarding Computer Aided Design/drafting will be sufficient to provide you the basis for your work. |

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| Classification ISCED | 0732 Building and civil engineering |

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| Available grade | Competent / Not yet competent |

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| Modification history | N/A |

| **Unit of Competency** | **Performance Criteria** | **Knowledge** | **Tools & Equipment** |
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| C1. Apply Auto-CAD fundamentals | You will be able to: P1. Specify the uses of the software Auto-CADP2. Install the Auto-CAD on the system following installation instructionsP3. Specify the unit (scale), precision, drawing limits in the model space for a specific drawing assignmentP4. Specify grid, snap and selection tool for specific drawing assignment P5. Prepare backup file for the assignment to avoid data loss P6. Apply health and safety precautions at workplace   | You will be able to: K1. Describe the uses of software AutoCADK2. Describe the features of drawing window including* Main menu
* Down drop menu, sub menu
* Tool bar
* Task bar
* Command area
* User coordinate system (UCS)

K3. Explain the followings1. Unit
2. Drawing limits
3. Grid
4. Snap
5. Selection

K4. Describe the file saving and backup method K5. Describe specific safety precautions and guidelines | Compatible Computer system for using Auto-CAD, Auto-CAD software (latest version) CD, personal protective equipment (PPE) |
| C2. Apply Auto-CAD draw toolbar to make a sketch | You will be able to:P1. Draw following lines, as per assignment requirement:* Construction line
* Ray line
* Line
* Poly line

P2. Draw following geometric objects, as per assignment requirement:* Rectangle/square
* Circle/arc
* Ellipse/ elliptical arc
* Polygon

P3. divide and measure specific space using point command P4. Apply boundary and hatch command for filling space, with specific symbols and solid colors  | You will be able to:K1. Describe the usage of tools required for this jobK2. Describe the method to carry out the following commands using lines* Construction line
* Ray line
* Line
* Poly line

K3. Describe the method to draw the following objects:* Rectangle/square
* Circle/arc
* Ellipse/ elliptical arc
* Polygon

K4. Describe how to divide and measure a line or object with the help of point command K5. Describe how to fill up space with specific material symbol and colors | Compatible Computer system for using Auto-CAD, Auto-CAD software (latest version), PPE |
|  C3. Apply Auto CAD modify toolbar | You will be able to: P1. Apply following tools to modify objects in Auto CAD* Erase
* Trim
* Chamfer
* Fillet
* Break/join

P2. Apply following tools to modify objects in Auto CAD* Off set / mirror
* Copy
* Extend
* Array
* Move
* Rotate
* Scale
* Stretch
* Align
 | You will be able to:K1. Describe the usage of tools required for this jobK2. Describe the use of the following tools to modify drawings in Auto CAD * Erase
* Trim
* Chamfer
* Fillet
* Break/join

K3. Describe the use of the following tools to modify objects in Auto CAD* Off set / mirror
* Copy
* Extend
* Array
* Move
* Rotate
* Scale
* Stretch
* Align
 | System compatible for using Auto-CAD, Auto-CAD software(latest version), PPE |
| C4. Apply layer, text and dimension toolbar | You will be able to: P1. Create layers for an object in Auto CAD as per assignment’s requirement (e.g: line, boundary, hatch, text, dimension, fixture etc.) P2. Prepare text style and create text as per assignment’s requirement P3. Prepare dimensional style and create following dimensions * Linear
* Aligned
* Base line
* Continuous
* Oblique
* Diameter/radius
* Angular

P4. Create and modify dimensions as per assignment* Align text
* Update dimensions
 | You will be able to: K1. Describe the concept of layers and its application * Line weight
* Line type
* Color
* Defpoint layer

K2. Describe working of layer * Freeze/thaw
* Lock/unlock
* Current
* Filter
* Layer match
* Layer delete

K3. Describe text type and styleK4. Explain dimension style as per following * Linear
* Aligned
* Base line
* Continuous
* Oblique
* Diameter/radius
* Angular

K5. Explain modify dimensions | System compatible for using Auto-CAD, installed Auto CAD software, PPE |
| C5. Build and use library of components (blocks) | You will be able to: P1. Create a specific small object (symbols etc) to be used in a drawing as per assignment’s requirement * Door
* Window
* Ventilator
* Furniture / interior items
* Fixtures
* Landscape

P2. Insert block in a drawing as per assignment P3. Modify blocks required for a specific drawing  | You will be able to:K1. Explain block creation for the following * Door
* Window
* Ventilator
* Furniture / interior items
* Fixtures
* Landscape

K2. Describe method of insertion of a block K3. Explain how to modify a block for specific requirement in a drawing  | System compatible for using Auto-CAD, installed Auto CAD software, PPE |
| C6. Create working set of drawings, submission drawing  | You will be able to: P1. Create working set of drawings as per assignment * Layout plan
* Working plan
* Elevation
* Section
* block diagram

P2. Create working details of following as per assignment* Doors /windows
* Kitchen/bath
* Foundation
* Stair
* Tanks (septic, water storage )
* Floor finishing
 | You will be able to: K1. Explain working set of drawing as per following:* Layout plan
* Working plan
* Elevation
* Section
* block diagram

K2. Describe detail working drawing including * Doors /windows
* Kitchen/bath
* Foundation
* Stair
* Tanks (septic, water storage )
* Floor finishing
 | System compatible for using Auto-CAD, installed Auto CAD software, PPE |
| C7. Create 3D model (presentation) of architect’s concept  | You will be able to: P1. Create 3D model ( wireframe) of an architectural assignment as per requirement P2. Apply followings to the wireframe model * Material application
* Light application
* Camera as per view requirement

P3. Apply render command and create raster image of the assigned model  | You will be able to:K1. Explain 3D model (wireframe) for an architectural assignment K2. Describe how to prepare 3D model including the following * Material application
* Light application
* Camera as per view requirement

K3. Explain how to render and create raster image of 3D model  | System compatible for using Auto-CAD, installed Auto CAD software, PPE |
| C8. Apply printing to design | You will be able to:P1. Install/select the printer/ plotter software as per installation manual P2. Set up printing/plotting detail for a particular drawing/assignment * Paper size
* Orientation
* Scale
* Color / monochrome

P3. Apply printing/plotting command in different formats * Hard copy
* Raster image
* PDF
 | You will be able to: K1. Define printing/plotting process and its importance K2. Explain set up procedure for printing/plotting a drawing * Paper size
* Orientation
* Scale
* Color / monochrome

K3. Describe printing/plotting command for the following out put * Hard copy
* Raster image
* PDF
 | System compatible for using Auto-CAD, installed Auto CAD software, printer, plotter, scanner , PPE |