AutoCAD 2D, 3D & Smart CAD Workflows - Syllabus

A focused 8-module industry-ready path covering precision 2D drafting, domain engineering and architectural drawings, 3D solid modeling, sheet sets and plotting, and smart CAD & automation workflows with hands-on practical training.

Part A - 2D Drafting Foundations & Domain Drawings

Course objective

Master coordinate systems, precision geometry, modify and layer workflows, annotations, blocks, Xrefs, and multi-domain 2D engineering and architectural drawings.

Module 1: AutoCAD Interface, Coordinates & Precision 2D Geometry

CAD overview & industry scope, workspace navigation, ViewCube, drawing units & limits setup, absolute, relative & polar coordinates, dynamic input, command line & ribbon customization, line, polyline, construction lines, ray, rectangle, polygon, circle, arc, ellipse, spline, revision cloud, Object Snap (Osnap), Object Snap Tracking (Otrack), and polar tracking.

Module 2: Modify Workflows, Layers, Annotations & Reusable Blocks/Xrefs

Move, copy, rotate, scale, stretch, mirror, trim, extend, offset, fillet, chamfer, blend curves, rectangular/polar/path arrays, join, break, lengthen, explode, grip editing, layer creation & management, layer states, property & group filters, color, linetype, lineweight, Ltscale, Matchprop, Quick Select (QSELECT), single-line & multiline text, text styles, dimensions, leaders/multileaders, hatch patterns, gradients, transparency, tables, Block, Write Block (WBLOCK), Design Centre, tool palettes, attributes & extraction, dynamic blocks, and External References (XREF).

Module 3: Architectural Floor Plans, Elevations, Sections & Civil Site Layouts

Wall thickness conventions, room zoning, circulation, staircases, openings, kitchen/bathroom layouts, clear architectural annotations, front/side elevations, section cuts, datum levels, sill/lintel heights, door/window schedules, submission-style drawing sheet organization, plot boundaries, setbacks, road/drainage alignments, site levels, footing/slab layout references, and site documentation standards.

Module 4: Interior Joinery, Mechanical Assemblies with BOM & Electrical Schematics

False ceiling layouts, flooring/tile patterns, electrical/lighting points, cabinetry/wardrobe elevation details, material callouts, orthographic projections (first & third angle), sectional views, threads/fasteners, basic GD&T/tolerance callouts, assembly views, Bill of Materials (BOM), standard electrical symbols, single-line diagrams, circuit/control schematics, distribution/panel layouts, and tagging/documentation basics.

Learning outcomes

Draft accurate 2D geometry with precision snaps, layers, annotations, blocks, and Xrefs, and produce architectural, civil, interior, mechanical, and electrical drawings to industry standards.

Part B - 3D Modeling, Visualization, Sheet Sets & Smart CAD Automation

Course objective

Transition from 2D to 3D solid modeling, apply materials, lighting, and rendering, publish scaled sheet sets, and use smart CAD assistants, cleanup tools, and automation workflows.

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Module 5: 3D Workspace, UCS, Solid Primitives & Boolean Modeling

3D modeling workspace, visual styles (Wireframe, Hidden, Conceptual, Realistic), User Coordinate System (UCS) manipulation, 3D primitives (box, cylinder, cone, sphere, wedge, torus), EXTRUDE, REVOLVE, SWEEP, LOFT, PRESSPULL, Boolean union/subtract/intersect, 3D move/rotate/mirror/array, fillet/chamfer edges, shelling, and face editing.

Module 6: 2D-to-3D Modeling, Materials, Lighting, Cameras & Rendering

Converting 2D floor plans into 3D walls, door/window openings, slabs, stairs, and roofs, or converting 2D profiles into 3D mechanical components, assigning and adjusting materials/textures, sunlight and artificial lighting setups, camera views, walkthrough/presentation views, and rendering presets.

Module 7: Layouts, Viewports, Plot Styles, Sheet Sets & Interoperability

Model space vs. paper space layouts, creating and scaling viewports, page setup manager, title blocks & borders, CTB/STB plot styles, organizing multi-sheet drawing packages with Sheet Set Manager, batch PDF/DWF plotting, eTransmit bundling with Xrefs/fonts/plot styles, and DWG exchange with Revit, SketchUp, 3ds Max & SolidWorks.

Module 8: Smart CAD Assistants, Cleanup, Auditing & Automation Workflows

Smart assistants for command lookup, specifications, checklists, and design review vs. human engineering judgment, converting scanned plans/sketches/PDFs into editable CAD geometry, cleaning duplicate objects (OVERKILL), auditing and recovering files (AUDIT, RECOVER, PURGE), smart layer/block/schedule auditing, script files (.scr), batch plotting, and introductory AutoLISP routines.

Learning outcomes

Model 3D solids and architectural/mechanical assemblies, set up materials, lighting, and renders, publish Sheet Sets and eTransmit packages, and apply smart CAD cleanup and automation workflows.

Program Summary

- **Structure:** 8 structured modules across 2 parts covering 2D drafting, domain drawings, 3D modeling, sheet sets, and smart CAD automation.
- **Career & Practical Readiness:** Hands-on drafting and modeling practice, standardized plotting/interoperability, and job-ready CAD deliverables.

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