# SKILLS that can get your engineering career Growing









This document is only for viewing purpose

# AutoCAD for Mechanical Engineers



**Duration** 80 Hours



**Courseware Issued** AutoCAD for Mechanical Engineers Reference Guide

- Introduction to engineering drawings and AutoCAD
- Drafting basic geometry shapes in AutoCAD
- Modifying drawings in AutoCAD
- Layer management
- Hatching and gradient technics
- Isometric drawings
- Dimensioning and Tolerancing
- Parametric drawing
- Blocks and attributes
- External reference (Xref) concepts
- Object linking and embedding (ole) concepts
- Plot and publish
- 3D modeling
- Advanced drafting using AutoCAD Mechanical
- Mechanical features drawing
- Drafting assemblies
- Tutorials and projects

# AutoCAD 2D for Mechanical Engineers



**Duration** 40 Hours



#### **Courseware Issued**

AutoCAD 2D for Mechanical Engineers Reference Guide

- Introduction to engineering drawings and AutoCAD
- Drafting basic geometry shapes in AutoCAD
- Modifying drawings in AutoCAD
- Layer management
- Hatching and gradient technics
- Dimensioning and Tolerancing
- Parametric drawing
- Blocks and attributes
- Xref, OLE concepts
- Plot and publish
- Tutorials and projects

### Geometric Dimensioning & Tolerancing



**Duration** 16 Hours



**Courseware Issued** GD & T Reference Guide

- Dimensions and drawings
- Tolerance dimensioning
- Ways of expressing tolerance
- IT grades
- Introduction to "ASME Y14.5M-1994"
- GD & T rules
- Maximum Material Condition of a feature of size
- Least Material Condition of a feature of size
- Concept of virtual condition
- Concept of bonus tolerance
- Planar datums
- Modifiers and symbols
- Tolerance types

### Creo / Parametric

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Duration 80 Hours



- Creo/Parametric concepts
- Creating sketcher geometry
- Creating extrudes, revolves, and ribs
- Selecting and editing
- Creating datum features
- Creating sweeps and blends
- Creating holes and shells
- Creating rounds, chamfers and drafts
- Variable section sweeps, helical sweeps and swept blends
- Layers, family tables & UDF
- Assembling with constraints
- Exploding assemblies
- Creating surface features
- Creating drawing views
- Creating drawing details

#### **Courseware Issued**

Creo/Parametric Reference Guide with Workbook

- Using advanced assembly constraints
- Creating and using component interfaces
- Creating and using flexible components
- Using assembly features and shrinkwrap
- Replacing components in an assembly
- Understanding simplified Reps
- Creating cross-sections display styles, and combined views
- Creating skeletons
- Sheet metal design

### **Creo Simulate**







Courseware Issued CREO Simulate Reference Guide

- Theoretical Fundamentals
- Preparing a CAD Model
- Pre-processing
- Meshing
- Structural Static Analysis
- Model Analysis
- Buckling Analysis
- Symmetry
- Thermal
- Assembly Analysis
- Dynamic analysis
- Optimization Study

### CATIA

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**Courseware Issued** CATIA Reference Guide with Workbook

- CATIA user interface
- Creating and editing sketches
- Creating sketch based features
- Creating transformation features
- Creating dress up features
- Creating advanced replication tools
- Assembly design
- Editing parts in assembly
- Creating surface features
- Generative sheet metal design
- Drawing view generation
- Bill of materials, balloons
- Finalizing the drawing and printing
- Dress up on 2D Views
- Real time rendering

### **CATIA Kinematics**







**Courseware Issued** CATIA Kinematics Reference Guide

- Kinematics Overview
- Graphic User Interface of CATIA Kinematics
- Basic mechanism process
- Creating Joints
- Motion Transfer Joints
- Rotating Joints
- Complex Joints
- Converting Constraints into Joints
- Generating Mechanisms
- Simulating Mechanisms
- Evaluating Mechanisms
- Swept Volume

### Reverse Engineering using CATIA



**Duration** 40 Hours



**Courseware Issued** Reverse Engineering Reference Guide

- Reverse Engineering (Using CATIA)
- Process in Reverse Engineering
- Reverse Engineering Hardware and Software
- Getting Started
- Processing the point cloud data
- Importing cloud data
- Creating and editing scans
- Curve creation
- Creating surfaces from curves (QSR)
- Completing the surfaces with GSD

### SolidWorks



**Duration** 80 Hours



Courseware Issued SolidWorks Reference Guide

- Sketcher basics
- 3D sketching
- Part modeling
- Creating reference geometries
- Editing features
- Advanced modeling tools
- Configuration
- Design table/library features
- Import/export of files
- Surface modeling

- Bottom-up assembly design
- Top-down assembly design
- Exploding assemblies
- Simulation/ Detailing
- BOM, balloon tools
- Sheet metal design
- Weldment design

### SolidWorks Motion



**Duration** 40 Hours



**Courseware Issued** SolidWorks Motion Reference Guide

- Types of Motion Studies
- Particle dynamics
- SolidWorks Motion Capabilities
- SolidWorks Motion Entities
- Animation and Basic Motion
- Motion Simulation
- Using SolidWorks Motion for solving Particle Dynamics problems
- Using SolidWorks Motion for Solving Multi body Dynamics with examples
- Results Plots and Verification

### Autodesk Inventor



**Duration** 80 Hours



Courseware Issued Inventor Reference Guide

- Autodesk Inventor User Interface
- 2D sketching
- 3D sketching
- Parametric Part Modeling
- Editing Features
- Advanced Modeling Tools
- Creating I- Part, I- Features, I-Logic
- Assembly Design
- Bottom Up Assembly
- Top- Down Assembly
- Creating Adaptive, Flexible components
- Creating Presentation File
- Understanding Simplified Assemblies
- Using Shrinkwrap
- Creating Skeleton Modeling
- Sheet metal Design
- Surface Modeling
- Drafting & Detailing
- Freeform Modeling
- Inventor Studio

NX CAD

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Duration 80 Hours



Courseware Issued NX CAD Reference Guide

- User interface
- Sketcher essentials
- Constraining sketches
- Datums
- Creating part features
- Editing parts
- Creating fundamental curves
- Editing curves
- Editing freeform features
- Basic assembly concepts
- Creating assemblies
- Positioning assembly components
- Assembly revisions and component replacements

- Assembly sequencing
- Assemblies clearance and analysis
- Deformable components
- Part families
- Introduction to drafting
- Drawings and views
- Creating dimensions, notes and labels
- Plotting drawings

### NX CAM



**Duration** 40 Hours



Courseware Issued NX CAM Reference Guide

- •The operation navigator
- Manufacturing operations and post processing
- Wizards and shop documentation
- Planar milling -introduction and profiling
- Engrave text
- Face milling
- Cavity milling
- Z-level milling
- Thread milling
- Area milling.
- Radial cutting
- Surface area cutting
- Engraving
- Contour profiling
- Common parameters
- Rough and finish turning
- Centerline drilling
- Groove and thread operations
- Multiple spindles and IPW

### NX Nastran



**Duration** 80 Hours



**Courseware Issued** NX Nastran Reference Guide

- Finite element analysis
- NX Nastran overview
- Geometry abstraction
- Geometry idealization
- Specifying materials
- Meshing the geometry
- Model checking process
- Defining boundary conditions
- Solving the FE model
- Post-processing the solution
- Generating reports
- Import and export of model data
- Applying contact and gluing conditions
- Linear static analysis
- Modal analysis
- Buckling analysis
- Response analysis
- Thermal analysis
- Nonlinear static analysis
- Assembly FEM
- Optimization study

### Ansys Workbench



**Duration** 80 Hours



Courseware Issued ANSYS Workbench Reference Guide

- Introduction to CAE
- General Procedure involved in FEA
- GUI of ANSYS Workbench
- Working on a Project
- CAD modeling using ANSYS Workbench
- Defining and Assigning Materials
- Generating the mesh
- Optimizing the model to refine mesh

- Working with different boundary conditions
- Surface and Line Models
- Static Structural analysis
- Model analysis
- Buckling analysis
- Thermal analysis
- Coupled Field (Thermal Stress)
- Post Processing

### Ansys Fluent







**Courseware Issued** ANSYS Fluent Reference Guide

- Basics of CFD
- CFD simulation setup
- CFD meshing
- Flow mixing
- Heat Transfer
- Transonic Flow Airfoil
- Multiple Species
- Turbulence Modeling
- Radiation and convection models
- Plane frame design
- Geo technical module
- Siphoning

# HyperMesh



**Duration** 40 Hours



**Courseware Issued** HyperMesh Reference Guide

- Introduction to FEM
- Brief on Meshing
- Basic interaction with HyperMesh
- Preparing geometry for meshing
- Shell meshing
- Tetra meshing
- Mesh quality check
- Shrinkwrap mesh
- Assemblies: welding and swapping parts
- Analysis Setup
- HyperMesh Solver Interfaces
- Post process setup
- Review, Test and Project Discussion

### **3D** Printing

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**Duration** 24 Hours



Courseware Issued 3D Printing Reference Guide

- Introduction of 3D Printing
- Evolution of 3D Printing
- About Additive Manufacturing
- CAD File formats for 3D print
- Stereo lithography files
- Various Printing technologies (SLA, SLS, FDM, Poly jet printing, Color jet Printing, SHS, SLM,LOM, Multi jet Printing,DLP)
- FDM in detail
- Preparation of print ready file using Plasto 200
- Operating Plasto 200 Live Demonstration
- STL principles
- Object Placement
- Print Settings
- Material Properties
- Manual Controls
- Supports
- Project

# NDT (QA/QC)



**Duration** 96 Hours



**Courseware Issued** Non Destructive Testing (NDT) Reference Guide

#### **Radiographic testing**

- Basic principle, Radiographic testing technique.
- Radiation safety

#### Magnetic particle testing

- Basic principles
- Codes, standards, specifications and procedures

#### (mt)

• Presentation and recording of results (mt)

#### Ultrasonic testing

- Basic principles
- Characteristics of wave propagation
- Measurement and calibration techniques

#### Liquid penetrant testing

- General description
- Steps of liquid penetrant testing
- Flaws under tensile or no loading than flaws under compression loading

#### Visual testing

- Visually inspecting a weld
- Examination requirements
- Weld discontinuities

# Piping and Welding (QA/QC)



**Duration** 24 Hours



**Courseware Issued** Piping and Welding Reference Guide

#### **Piping & Standards**

- Types of pipes based on manufacturing process
- Valve selection& Standards
- Piping drawings
- Process and instrumentation drawing
- Pipe support
- Loads on piping system

#### Welding

- Classification
- Welding with or without filler material
- Source of energy for welding
- Types of joints
- Weld symbols , Weld defects

#### ASME ix brief introduction

- Introduction
- WPS, PQR, SWPS, WPQR
- Acceptance standards
- PQR/ WPQR testing
- Weld inspection and testing

### **HVAC** Design







Courseware Issued HVAC Reference Guide

- Introduction to Heating ventilation and Air conditioning, Psychrometric Chart
- Refrigeration Cycle, Types of AC system
- Cooling and Heating load calculation
- General heat load calculation, Duct Designing
- Air Terminals, Toilet Ventilation
- Kitchen hood ventilation, Car parking ventilation
- Tunnel Ventilation, Stairwell Pressurization
- Chillers/DX system
- Cooling towers, Coil selection, VRF system, District cooling
- Air Curtains, ESP, Heating system
- Drafting using AutoCAD
- Kitchen Hood, Toilet ducting, AHU, examples on car parking plans, Duct sizing in AutoCAD.

# **AEC CADD - Modeling**

# AutoCAD for Architects and Civil Engineers



**Duration** 80 Hours



**Courseware Issued** AutoCAD for Architects and Civil Engineers Reference Guide

- Drafting basic geometry
- Layer management
- Hatching and gradient technics
- Isometric drawings
- Dimensioning
- Parametric drawing
- Blocks and attributes
- Modifying drawings in AutoCAD
- External reference (Xref) concepts
- Object linking and embedding (OLE) concepts
- Layout management
- Plot and publish
- 3D modeling concepts in AutoCAD
- Introduction to AutoCAD Architecture
- Advanced drafting using AutoCAD Architecture
- AEC objects
- Tutorials and projects

### AutoCAD 2D for Architects and Civil Engineers



**Duration** 40 Hours



#### Courseware Issued

AutoCAD 2D for Architects and Civil Engineers Reference Guide

- Introduction to engineering drawings and AutoCAD
- Drafting basic geometry shapes in AutoCAD
- Modifying drawings in AutoCAD
- Layer management
- Hatching and gradient technics
- Dimensioning and Tolerancing
- Parametric drawing
- Blocks and attributes
- Xref, OLE concepts
- Plot and publish
- Tutorials and projects

### Microstation



**Duration** 64 Hours



**Courseware Issued** MicroStation Reference Guide

- Introduction
- Understating the interface
- MicroStation workflow
- Working with views
- Creating and modifying elements
- Annotation tools
- Dimensioning
- Working with levels
- Working with references
- Printing methods

### **ARES** Commander



Duration 24 Hours



**Courseware Issued** ARES Commander Reference Guide

- User Interface
- Drafting Options
- File Management
- Draw Entities
- Modify Entities
- Annotation & Dimensions
- Reference Manager
- Sheet, model work space
- Model workspace
- Page Layout manager
- Attach Image, PDF
- Attach Drawing
- Export, Pack and Go

# SketchUp







**Courseware Issued** SketchUp Reference Guide

- Templates
- Inference: Concept, Inference Locking
- Pushing and Pulling Shapes into 3D
- Building models as a Block
- Building models using Components
- Building models from DWG
- Building models using Match Photo
- Modeling with accuracy tools
- Modeling with static & dynamic components
- Component attributes
- Presenting your model
- Camera, section, scenes, styles, layers, materials
- SketchUp layout

### **Revit Architecture**



Duration 120 Hours



**Courseware Issued** Revit Architecture Reference Guide

- Introduction to BIM & Revit Architecture
- Place and modify Walls & Complex Walls
- Add and modify Wall Profiles
- Place Doors, Windows & Components
- Dimensions and Constraints
- Create Floors and Ceilings
- Curtain Walls & Stairs
- Conceptual Models
- Annotation & Schedules
- Sheets and Title Blocks
- Views, Camera, Walk-through, Render & Solar Study
- In-Place Families
- Family Creation
- Site Design
- Link Projects & Collaboration
- Design Phase
- Realistic Presentations
- Import & Export

# Bentley AECOsim Building Designer



Duration 80 Hours



Courseware Issued AECOsim Building Designer Reference Guide

- AECOsim User Interface
- Different Modules in AECOsim Building Designer
- Working with AECOsim Architectural Building Designer
- Federated Models of the Project
- Creating UCF and PCF
- Configuring grids and floors
- Drafting and Modifying Tools
- Creating an Architecture Model
- Creating dynamic views of the model
- Part & Families
- Drawing templates
- Working with content libraries
- Importing and exporting models
- Rendering

# Max for Engineers / Architects



Duration 80 Hours



#### Max for Engineers / Architects

Courseware Issued

Reference Guide

- Introduction to 3ds Max
- Modeling using basic primitives
- Transforming objects
- Customizing working units
- Arranging objects using utility tools
- Modeling using parametric modifiers
- Editing Poly Models using Caddy Interface
- Spline modeling

- Landscaping and modeling using Compound Objects
- Construct using Architectural objects
- Views Lights and Cameras
- Textures Basic & Advance
- Particle Systems & Forces
- Importing other formats
- Basics of Animation
- Walk-through
- Advanced Rendering

# Design Visualization.Pro



**Duration** 40 Hours



#### **Courseware Issued** Design Visualization.Pro Reference Guide

- Introduction to 3ds Max Design
- Understanding about primitives and selection methods
- Modeling using parametric modifiers and shapes
- Interoperability with AutoCAD and Revit Architecture models
- Handling Slate Material Editor using libraries
- Understanding about the lighting concepts
- Working with Particle Systems and Environmental Effects
- Handling daylight effects
- Working with latest Rendering Engines
- Understanding the Animation Concepts
- Working in Track views for animating the Revit models
- Video post for Animations

# 5D BIM using Navisworks



**Duration** 24 Hours



- Introduction About Autodesk Navisworks Manage
- Review the Model
- Object Attributes
- Create and use set of Objects
- Manipulate Object Attributes
- Transform Objects
- Measure tools
- Links
- Navigate the scene
- Clash Detection
- Timeliner

**Courseware Issued** Navisworks Reference Guide

- Timeliner Costs
- Animator
- Use Animator for Soft Clashing
- Scripter
- Quantification Tool
- Perform Model Takeoff
- Update and Analyze data
- Adding Materials to a Model
- Material Mapping
- Lighting
- Sun and Sky Lights
- Photorealistic Rendering

# **Building Estimation and Costing**



Duration 24 Hours



**Courseware Issued** Building Estimation and Costing Reference Guide

- Introduction
- Customizing Currencies & Catalog Creation
- Work Breakdown Structure
- Manual Takeoff Tools: Area, Backout, Linear, Count
- Automatic Takeoff Tools: Model, Search, Single Click
- Assembly & Validate Takeoff Data
- Compare & Display
- Report Generation & Export

# AEC –Analysis/Design

### STAAD.Pro



Duration 80 Hours



- Model Generation and Editing
- Assigning loads
- Automatic load generations:
  Slab, Wind and Moving loads
- Concrete Design
  - Column and Beam design
- Seismology
  - Seismic Analysis and Design
  - Dynamic Analysis
    - Response Spectrum
    - Time History Analysis

- **Courseware Issued** STAAD.Pro Reference Guide
  - FEM / FEA
    - Water Tank Design
    - Slab Design
    - Staircase Design
    - Shear wall Design
    - Bridge Deck design
  - Steel Design
    - Steel Frame Structure Design
    - Overhead Transmission
    - Line Towers Design
    - Steel Structure design with Pushover Analysis
  - Foundation Designs
    - Isolate, Combined, Strip, Mat and Pile Cap
  - Report Generation and Plotting

### ETABS



**Duration** 80 Hours



Courseware Issued ETABS Reference Guide

- Introduction
- Plane Frame Modelling
- Space Frame Modelling
- Load Pattern and Definition
- Analysis and Analysis Reports
- Concrete Frame Design and Detailing
- Shear wall design
- Steel frame design
- Steel connection design

- Steel joist design
- Flat slab design
- Waffle slab design
- Seismic analysis
- Detailing
- Steel Design and Detailing
- Composite Beam Design
- Introduction to Dynamic Analysis

# Ansys Civil



**Duration** 40 Hours



**Courseware Issued** Ansys Civil Reference Guide

- Introduction Structural Engineering
- FEM
- Civil FEM Setup
- Modelling in ANSYS
- Loads
- Solve
- Civil Post processing
- LS Files
- Load Combination

- Concrete Design
- Modelling
- Slab Design
- Pre-stressed Concrete Design
- Bridge Design
- Geotechnical Module
- Seismic Design
- Steel Design

### ProSteel



**Duration** 64 Hours



**Courseware Issued** ProSteel Reference Guide

- Creating and working with Workframes
- Working with Display and Area Classes
- Inserting Steel Shapes
- Shapes Manipulation
- Working with Plates
- Creating Connections
  - End Plate
  - Base Plate
  - Bracing
  - Purlin
  - Web Angle
  - Shear Plate
- Working with Structural Elements
  - Handrail
  - Stair
  - Ladder
- User created shapes
- Part Family
- Detailing
  - Symbol creation
  - Grouping
  - Material Takeoff
  - Dimension

# **RCC** Detailing



**Duration** 40 Hours



Courseware Issued RCC Detailing Reference Guide

- Introduction
  - RCC Detailing
  - AutoCAD Structural Detailing
- Effective usage of Country Specific Templates and Standards
- Element Creation
  - Automatic
  - Manual
- Slab Creation with Surfacedistribution
- RCC Detailing of
  - Foundation
  - Column
  - Beam
  - Slab
  - Staircase
  - Retaining Wall
- Drawing Preparation
- Bar Bending Schedule
- Export
- Print

AEC –Survey/Transportation

### AutoCAD Civil 3D



**Duration** 80 Hours



- Computer Aided Land Survey
  - Working with point data
  - Surface creation
  - Surface analysis
  - Parcels
- Transportation Design
  - Design Criteria
  - Alignment Creation
  - Corridor Creation
  - Intersection Design

Courseware Issued AutoCAD Civil 3DReference Guide

- Roundabout Design
- Custom Assembly Creation
- Report Generation
  - Earthwork Calculation
  - Quantity Takeoff
- Pipe Layout
  - Design Rules
  - BOM
- Plotting

### MX ROAD







- View controls
- Survey inputs and validation
- String names and Drawing styles
- Point Selection Methods
- Surface checker
- String creation and editing
- Surface analysis
- Earthwork calculation
- Alignment creation
  - Horizontal
  - Vertical
  - Best fit

Carriageway design

MXROAD Reference Guide

Junction design

**Courseware Issued** 

- Shoulder design
- Pavement design
- Dynamic reports
- Road redesign
- Overlay design
- Section views
- Final drawings

# Computer Aided Land Survey Using AutoCAD Civil 3D

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**Duration** 24 Hours



Courseware Issued Computer Aided Land Survey using AutoCAD Civil 3D Reference Guide

- Introduction to Land Survey and AutoCAD Civil 3D
- Surface creation based on the survey data from
  - Theodolite
  - Total Station
  - Lidar
  - Google Earth
  - DEM files
- Surface Styles
- Surface Analysis
- Earthwork Calculation
  - Cut and Fill Volume
  - Grading
  - Profile View Generation
- Site Layout

# AutoCAD for Electrical and Electronics Engineers



**Duration** 80 Hours



#### Introduction to engineering drawings

- Drafting basic geometry shapes in AutoCAD
- Layer management
- Hatching and gradient technics
- Isometric drawings
- Dimensioning
- Blocks and attributes
- External reference (Xref) concepts
- Object linking and embedding (OLE) concepts
- Layout management

#### **Courseware Issued**

AutoCAD for for Electrical and Electronics Engineers Reference Guide

- Plot and publish
- Introduction to AutoCAD Electrical
- Symbol builder and circuit builder
- Schematic components
- Wires and wire numbers
- Programmable Logic controller
- Connectors
- Panel layout
- Reports and conversion tools
- Tutorials and projects

### **REVIT MEP**



Duration 80 Hours



**Courseware Issued** Revit MEP Reference Guide

- Introduction
  - MEP Design
  - Revit MEP
- Work sharing
- Family Creation
  - Solid Modeling
  - Equipment
  - Light Fixture
  - Devices
- HVAC Design
  - Heating and Cooling Load Analysis
  - Logical Systems
  - Mechanical System and Duct Work
  - Mechanical Piping System
  - Inspect System
  - Electrical Design
  - Lighting Analysis
  - Power and Communication Design
- Plumbing Design
- Fire Protection System
- Schedules
- Documentation
- Sheet Setting
- Printing

# **Microsoft Project**

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**Duration** 64 Hours



#### Courseware Issued Microsoft Project Reference Guide with Workbook (Mechanical/Civil/Electrical)

- PPM Concepts
- Calendar
- Task / Relationships
- Work Breakdown Structure
- Constraints and Recurring Task
- Define and Assign Resource
- Resource Analysis and Leveling
- Baseline
- Update Project Progress
- Tracking
- Earned Value Analysis
- Customization and Formatting
- Generate Reports

# Your advantage



Flexible batch timings



Equips with industry specific CAD skills



Instructors certified by Internal Training Academy (ITA)



World class up - to - date curriculum



Tie up with International organizations



Globally valid Certification

Choose a level and course that best suits your needs.

### And get job-ready!

Note: The training for select courses will be conducted only at the client's site (Educational Institution / Corporate). The client must ensure the lab is equipped with the required software and hardware specifications for CADD Centre to conduct the associated course training. For further details please visit your nearest centre.



CADD Centre Training Services,

No. 91, Dr. Radhakrishnan Salai, 8th Floor, GEE GEE Crystal, office No.8C & 8D, Mylapore, Chennai 600 004.

😰 91 44 4596 6100 🙍 info@caddcentre.com 🕔 1800 425 0405

