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CAD/CAM TRAINING
An Overview of the Syllabus Coverage

MECHANICAL DRAUGHTMAN (10TH /12TH PASSED)

DURATION : 125 HRS

Need of Engineering Drawing : What is drawing, Use, Introduction to Engineering Drawing

Basic Units : Conversion of Units , Unit Systems - Metric, ANSI, IS, Degree

Orthographic Projections: Preparation of sketches , Line, circle, arcs, Ellipse etc. Types of Lines,line,weights, Dimensions, Projection of Solids, Introduction of Angle method, Standard views, Assembly drawing, Ballooning & BOM, Templates, Std. formats, Dimensions as per IS standards

Sections : What is section, Types of section, Use of section views, Convention in section views, Section of Solids

Isometric : Isometric concept, Need of isometric views, Isometric exercises, Dimension

Mechanical Features : Screw, fasteners Valves, Cotter, joints Welding, riveting Manufacturing Processes Piping symbols Limits & fits GD&T

Others: Introduction to mechanical and plumbing design , Introduction to AutoCAD & Pro-E (3D).

Theory
Practical Both are Conducted.

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AUTOCAD - (ELECTRICAL/ELECTRONICS/INSTRUMENTATION)

DURATION= 80 HRS

2D Drawings:

- Introduction of CAD
- preparations of Commands- Line,Circle,Arc etc.
- Using Basic Keys, Creating basic Objects.
- Working with Co-ordinate System.
- View Drawing (Zoom, Pan)
- Scaling objects, views.
- Drawing Orthographic objects.
- Duplication Using Mirror,Copy,Error,Trim
- Creating Block/Libraries
- Import/Export
- use of Xref
- Symbols for basic Electrical & Electronics Components
- Single line Diagram

3D Drawings:

- Introduction to 3D
- Extruding and revolving objects
- UCS concept and it's use
- Boolean using union, subtract and intersect
- Standard views
- shade Command
- Plotting

ISOMETRIC:

- Isometric snap
- Drawing Isometric objects
- Dimensioning

Others:

- Photo rendering
- Printing Documents
- Templates Insertion
- Motion path Animation

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AUTOCAD - (MECHANICAL/AUTOMOBILES/PRODUCTION)

DURATION :80 HRS

2D Drawings:

- Introduction of CAD
- preparations of Commands- Line,Circle,Arc etc.
- Using Basic Keys, Creating basic Objects.
- Working with Co-ordinate System.
- View Drawing (Zoom, Pan)
- Scaling objects, views.
- Drawing Orthographic objects.
- Duplication Using Mirror,Copy,Error,Trim
- Creating Block/Libraries
- Import/Export
- use of Xref
- Tolerance symbols, Datum, Finish, welding symbols etc.

3D Drawings:

- Introduction to 3D
- Extruding and revolving objects
- UCS concept and it's use
- Boolean using union, subtract and intersect
- Standard views
- shade Command
- Plotting

ISOMETRIC:

- Isometric concept
- Isometric snap
- Drawing Isometric objects
- Dimensioning

Others:

- Photo rendering
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- Motion path Animation

Theory & Practical both are conducted.

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CATIA

DURATION-120 HRS

Introduction to CATIA :Different work-benches in CATIA, CATIA interface

Fundamentals & Sketcher

- Introduction
- Sketcher User Interface
- Profile Sketcher
- Auto & Create Dimensions
- Selection Methods
- Modification by interactive
- Constraint (Geo-Metric,Dim)
-

Assembly Design

- Top Down & Bottom Assembly
- Assembly Constraints
- Degree of freedom in Assembly
- Move & Manipulate
- Bill of Material

Part modeling

- Part workbench concept
- Orientation & view
- Create feature with and without constraints
- Multipad
- Multipocket
- Shaft,slot,holes& groove
- Fillet & Chamfer
- Define & Edit patterns

Wireframe & Surface Design

- Concepts & Creation methods
- Wire frame creation
- Create & modify surface
- Sweep & blend surface
- Surface operation
- Shape Analysis
- Shape modification & operation

Drawing Details

- Introduction of drafting
- Template drawing sheet sizes

- Background, Working views
- Projection & section views
- Details, Clipping& Broken Views
- Bom& Balloons
- Modification in Drawing

EXTRA FEATURES

- File management
- Export and Import of CAD Files
- Design Changes
- Information from a model
- Rebuilding tools

Theory & Practical both are conducted.

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Solid works

DURATION - 125 HRS

Part Design:

- IntroductIon
- Sketcher mode
- Dimensioning
- Sketch planes
- Extruding, Revolving, Sweep features
- Parametric Modeling
- Adding Fillet, Chamfer, Shell and Draft
- Creating Patterns

Assembly Design:

- Creating Assembly Model
- Managing Assembly Models
- Defining Assembly constrains
- Adding Components

Drafting:

- Plotting various views
- Exploded Views and BOM
- Dimensioning
- Section, Detail and Auxiliary views

Advance Surfacing:

- Creating lofted features
- Creating advance sweep features
- Creating Tweak features
- Modifying features
- Advanced surface modeling

Sheet Metal:

- Introduction to Sheet Metal
- Bend, Jog, Dimple and Flange features
- Hole cut, Lofted Flange features
- Creating Flat Pattern

Photo Rendering:

- Introduction to Rendering
- Adding Lights
- Applying Colours, Textures, Materials etc.
- Applying user defined image on object

Extra Features:

- Import, Export using Solid works
- Solid works File Management
- Blue Print Reading.
- Design Changes
- information from a model
- How to apply Tolerances using IS Standards.

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PRO-E

DURATION- 120 HRS

Solid Modelling-Introduction, Creating Parts, Sketcher mode Dimensioning, Extruding, Revolving, Sweep features, Parametric Modelling, Modifying parts using History Adding Fillet, Chamfer, Shell and Draft Creating Patterns

Assembly- Creating Assembly, Model Managing, Assembly Models, Interface checking, Defining Assembly constraint

Drafting/Datum-Generative Drafting, Plotting various views, Exploded Views and BOM,Dimensioning Adding sectional, Detail and Auxiliary views, Annotations, Symbols and Datum features

Advance Surfacing-Creating lofted features, Creating advance sweep features , Creating Tweak features, Modifying features , Advanced surface modelling

Sheet Metal-Introduction to Sheet Metal, Bend, Jog, Dimple and Flange features , Hole cut, Lofted Flange features, Creating Development

Core Cavity-Introduction to core cavity Parting Line Extraction of Core & cavity Draft requirements

Mechanism Design (Animation)-Introduction to Animation, Defining of various, Joints Animation

Rendering-Introduction to Rendering, Adding Lights, Applying Colours, Textures etc., Applying user defined image on object

TIPS & Tricks-File Management Export and Import of CAD Files Concept of Version Files MANAGING PRO-E Environment

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UG - NX (PLM Software Siemens)

Duration - 120 Hrs

Solid Modeling -Introduction, Creating Parts, Getting parts geometric information, Sketcher mode, Dimensioning, Sketch planes extruding, Revolving, Sweep features, Parametric Modelling, Modifying parts using History Adding Fillet, Chamfer, Shell and Draft, Creating Patterns

Assembly Models - Creating Assembly Model, Managing Assembly Models, Defining Assembly constrains

Generative Drafting - Generative Drafting, Plotting various views, Exploded Views and BOM, Dimensioning Section, Detail and Auxiliary views Annotations, Symbols and Datum

Advance Surfacing -Creating lofted features, Creating advance sweep features, Creating Tweak features, Modifying features, Advanced surface modeling

Sheet Metal -Introduction to Sheet Metal, Bend, Jog, Dimple and Flange features, Hole cut, Lofted Flange features, Creating Flat Pattern

Machining -Fundamentals of CAM, Cutter Selection, Selection of speed, feed and operations, Tool paths for 2 and 1/2, 3 axis, Loops, Testing

Theory & Practical Both are Conducted.

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ANSYS WORKBENCH

Duration : 70 Hrs

Introduction of ANSYS

Pre-Processing:

- Introduction to FEA
- Starting ANSYS Workbench
- Exploring the GUI
- Graphics & Picking
- The Database and Files
- 2D Modelling
- Solid Modelling
- How to Import Geometry
- Material Properties
- Real Constants
- Multiple Load Cases
- Meshing - Multiple Element Attributes, Controlling Mesh Density
- Mapped Meshing, Hex-to-Tetra Meshing, Mesh Extrusion & Sweep Meshing
- Loads and Boundary conditions

Post-Processing :

- Introduction to Solvers
- Read, Write and Plot the Results
- Report Generation
- Animating Result
- File Handling
- Exporting Results to other Post-Processor

Types of Analysis:

- Structural Linear Static, Transient
- Structural Non Linear = Time, Material, Contact and Geometric
- Beam Modeling, Beam Meshing, Beam Properties & Loading
- Symmetric boundary conditions
- Buckling Analysis
- Modal Analysis Procedure
- Harmonic Response Analysis
- Vibration
- Thermal Analysis – Steady State & Transient
- Conduction, convection.
- Structural Thermal Analysis (Couple Field).
- Goal Driven Optimization

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REVIT MEP

Duration- 100hrs

Introduction-

- Building Information Modelling (BIM)
- Overview of the Revit MEP Interface
- Opening a Revit MEP Project
- Viewing Commands

Basic Drawing and Editing Tools-

- General drawing tools
- Editing Revit elements
- Basic modifying tools
- Additional editing tools

Starting Revit MEP Projects-

- Starting Revit projects
- Linking Revit models
- Copying and monitoring linked files
- Setting up levels

Views-

- Duplicating views
- Adding callout views
- Setting the view display
- Creating elevations
- Creating sections
- Working with ceilings

Revit MEP Systems-

- About Revit MEP Systems
- Working with Components
- Creating Systems - Overview
- System Graphics
- Connecting Components
- Analyzing Systems

Spaces and Zones-

- Creating spaces
- Creating zones
- Creating colour schemes

Performance Analysis-

- Introduction to energy analysis
- Preparing energy analysis
- Analyzing the heating and cooling loads

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- Exporting for secondary analysis

HVAC Systems-

- About HVAC systems
- Adding terminals and mechanical equipment
- Adding ductwork
- Creating duct systems
- Automatic ductwork layouts

Piping Systems-

- About piping systems (Rectangular/Round)
- Adding mechanical equipment
- Drawing piping
- Automatic piping layouts
- Analyzing piping systems
- Fire protection systems
- Sprinklers

Plumbing Systems-

- About plumbing systems
- Adding plumbing fixtures
- Drawing piping for plumbing systems
- Working with plumbing systems

Electrical Systems-

- About electrical systems
- Placing electrical components
- Creating electrical circuits
- Cable trays and conduit
- Electrical panel schedules

Construction Documents -

- Setting up sheets
- Placing and modifying views on sheets
- Printing sheets

Annotating Construction Documents -

- Working with dimensions
- Working with text
- Adding detail lines and symbols
- Creating legends

Tags and Schedules -

- Adding tags
- Working with schedules
- Creating schedules

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REVIT ARCHITECTURE

Duration - 120 HRS

Building Information Modeling
Building Information Modeling , About Building Information Modeling

Revit Architecture Basics : Exploring the User Interface, Working with Revit Elements and Families, Starting a Project

Starting a Design : Creating and Modifying Levels, Creating and Modifying Grids

The Basics of the Building Model : Creating a Basic Floor Plan, Adding and Modifying Walls, Working with Compound Walls, Using Editing, modification Tools

Loading Additional Building Components : Working with Component Families

Viewing the Building Model : Managing Views, Controlling Object Visibility, Working with Section and Elevation Views, Creating and Modifying 3D Views

Using Dimensions and Constraints : Working with Dimensions, Applying and Removing Constraints

Developing the Building Model: Creating and Modifying Floors, Working with Ceilings, Adding and Modifying Roofs, stairs, railings, curtain walls

Detailing and Drafting : Creating Callout Views, Working with Text and Tags, Working with Detail Views
Working with Drafting Views

Construction Documentation : Creating and Modifying Schedules, Creating Rooms and Room Schedules
Creating Legends and Keynotes

Presenting the Building Model: Working with Drawing Sheets, Working with Title blocks, Revisions, Creating, Renderings, Using Walkthroughs Using Sun and Shadow Settings

Others
Link Projects & collaboration
Import Export

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Creo-Parametric

Duration- 120 HRS

PRO/E :

- Pro/E Environment. File Management
- Menu, User Interface
- Working with menus & Dialog Boxes
- Sketch Mode Creating Geometry

PART MODE:

- Section User Interface
- Extruded Solid Protrusion
- Depth Option,Datum,Thin Protrusion, Extruded Cut
- Revolved Solid, Offset Feature,Chamfer,Variable Draft.
- Rib, Shell Sweep,Threading,Helical Sweep, Swept Blend
- Advanced Modeling, Variable Section Sweep, Boundary Blend Relations, Family Table,Udf & Group

Assembly Mode :

- Bottom Up Approach, Placing Component
- Assembly Operations
- Component Operations
- Subassemblies, Exploding
- Subtractive Assembly
- Model Analysis, Clearance Checking

Detailing :

- Drawing Fundamentals
- Formatting Basic View
- Specialized View, Sectional View
- Auto Dimensioning
- Showing & Erasing , Cross Hatching
- B.O.M Creating Balloons

MECHANISM :

- Conversion of Assembly mode to Mechanism mode.
- Constraining the parts in Mechanism
- Applying Motion to the Assembled Feature
- Animating the Feature.

BASIC SHEETMETAL :

- Wall Creation. Advanced Surfaces
- Advanced Walls, Rip Creation Bending/Unbending

BASIC MOLD DESIGN:

- Creating Reference Model
- Mold Component, Mold Volume
- Mold Opening , Mold Cavity

Extra Features :

- Surface Creation, Advanced Surfaces
- Surface Editing, Trimming Quilt Style Environment

Theory & practical Both are Conducted.

Industrial Projects.