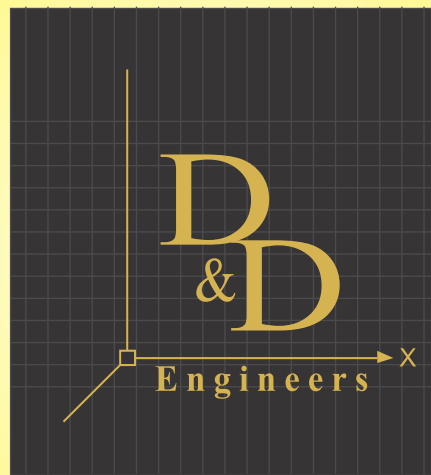
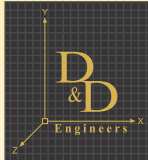


Mechanical Engineering Courses



Since-2015



ISO:9001-2015

DESIGN & DRAFT ENGINEERING INSTITUTE

AN MEP CENTER

Training | Placement Assistance | Mock Interviews | Site Visits

KnK Tower, Nr. Govt. Engineering College, Osmanpura, Aurangabad.



8698111134 / 8793637310



9730265601

 info@dndengineers.com, support@dndengineers.com  www.dndengineers.com

AUTOCAD

COURSE DURATION : 40HRS

SUMMARY:

AutoCAD is a commercial computer-aided design (CAD) and drafting software application. Developed and marketed by Autodesk, AutoCAD was first released in December 1982 as a desktop app running on microcomputers with internal graphics controllers

AutoCAD is used in industry, by architects, project managers, engineers, graphic designers, city planners and other professionals.

In support of both 2D and 3D design, AutoCAD features a range of commands that help with precision, such as centering lines and marks automatically calculated from your design size and placement, drawing dimensions that can be set to fixed proportions, and geometric arrays that help you more quickly replicate patterns.



COURSE CONTENTS

- Engineering drawing and AutoCAD
- Drafting basic shapes and geometries
- Modifying drawings in AutoCAD
- Layers, Block and attributes
- Hatching and gradients
- Isometric drawing
- Dimensioning and tolerances
- Parametric drawing
- External references concepts
- Object linking and embedding
- Plot and publish
- 3d modelling
- Advance drafting using AutoCAD mechanical
- Mechanical feature drawing
- Drafting assemblies

SOLIDWORKS

COURSE DURATION : 40HRS

SUMMARY:

Solidworks is a solid modeling computer-aided design (CAD) and computer-aided engineering (CAE) computer program published by Dassault Systemes, that runs primarily on Microsoft Windows. Solidworks is a solid modeler, and utilizes a parametric feature-based approach which was initially developed by PTC (Creo/Pro-Engineer) to create models and assemblies. The software is written on Parasolid-kernel. Parameters refer to constraints whose values determine the shape or geometry of the model or assemblies. At the initial stage, the software is used for planning, visual ideation, modeling, feasibility assessment, prototyping and project management. The software is then used for design and building of mechanical, electrical, and software elements. Over two million engineers and designers at more than 165,000 companies were using Solidworks as of 2013. Solidworks has developed also various complementary add-ins, including: PhotoWorks: 3D photorealistic rendering engine.



COURSE CONTENTS

Introduction to Solidworks

Sketch entities

Sketch modifying tools

Part modelling advance modelling tools

Introduction to assembly

Applying advance mates

Mechanical mates

Dimensioning

Tables

Surface modelling

Sheet metal design

Import/export cad files to other software

SOLIDWORKS MOTION

COURSE DURATION : 25HRS



SUMMARY:

Motion studies are graphical simulations of motion for assembly models. You can incorporate visual properties such as lighting and camera perspective into a motion study.

Motion studies do not change an assembly model or its properties. They simulate and animate the motion you prescribe for a model. You can use SOLIDWORKS mates to restrict the motion of components in an assembly when you model motion.

From a motion study, you can use Motion Manager, a timeline based interface.

COURSE CONTENTS

- Types of motion studies
- Particle dynamics
- Solidworks motion entities
- Animation and basic motion
- Motion simulation
- Using solidworks motion for solving particle dynamics
- Using solidworks motion for solving multibody dynamics
- Result plots and verification

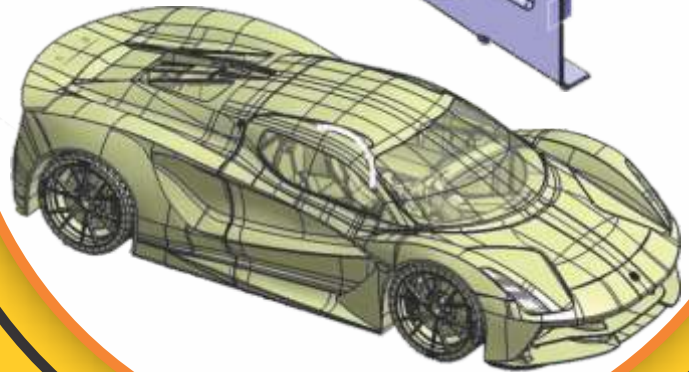
CATIA

COURSE DURATION : 40HRS

SUMMARY:

computer-aided three-dimensional interactive application) is a multi-platform software suite for computer-aided design (CAD), computer-aided manufacturing (CAM), computer-aided engineering (CAE), PLM and 3D, developed by the French company Dassault Systemes. it supports multiple stages of product development from conceptualization, design and engineering to manufacturing, Like most of its competition it facilitates collaborative engineering through an integrated cloud service and have support to be used across disciplines including surfacing & shape design, electrical, fluid and electronic systems design, mechanical engineering & systems engineering. CATIA saw wider adoption in the aviation and military industries with users such as Boeing & General Dynamics Electric Boat Corp.

CATIA is a solid modelling tool that unites the 3D parametric features with 2D tools and also addresses every design-to-manufacturing process.



COURSE CONTENTS

User interface of CATIA V5

Sketcher

Apply material

Reference elements

Transformation features

Boolean operations

Assembly

Constraints

Wireframe and surfaces

Generative sheet metal

Drafting

Annotations and dimensioning

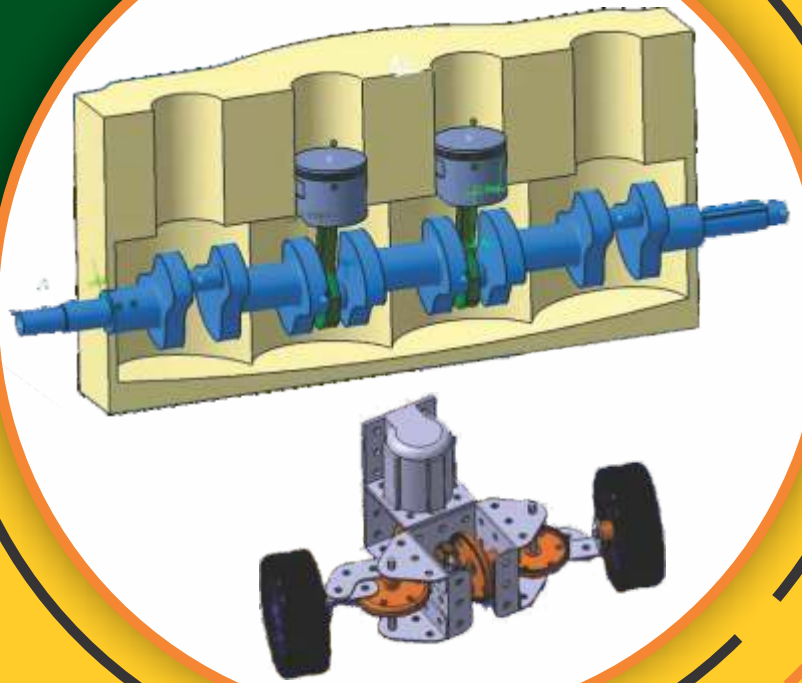
CATIA KINEMATICS

COURSE DURATION : 25HRS

SUMMARY:

CATIA enables the creation of 3D parts, right from 3D sketches, composites, metals, or tooling parts for the definition of mechanical assemblies. The software brings in advanced technologies for mechanical surfacing and BIW. It provides a tool for the completion of product definition that includes functional tolerances and kinematics definition. The course of CATIA Kinematics will teach you on how to execute designing with the use of the existing assembly. Students will also learn about ways to simulate and examine the methods of clashes and perform kinematics analysis.

CATIA Kinematics will allow the user to simulate the operation and analyze results of the mechanism. It will help engineering staff in manufacturing industries to evaluate movement of complex mechanism. The tool is famous for its feasibility, flexibility, functionality, and performance. Detection of newly automated collisions and CATIA can help in defining command laws on the mechanism and compute velocity and accelerations.



COURSE CONTENTS

- Kinematic overview
- Graphic user interface of CATIA kinematics
- Basic mechanism process
- Creating joints
- Motion transfer joints
- Rotating joints
- Complex joints
- Converting constraints into joints
- Generating mechanism
- Simulating mechanisms
- Evaluating mechanism
- Swept volume

CREO PARAMETRIC

COURSE DURATION : 40HRS

SUMMARY:

Creo is a family or suite of Computer-aided design (CAD) apps supporting product design for discrete manufacturers and is developed by PTC. The suite consists of apps, each delivering a distinct set of capabilities for a user role within product development.

IT provides apps for 3D CAD parametric feature solid modeling, 3D direct modeling, 2D orthographic views, Finite Element Analysis and simulation, schematic design, technical illustrations, and viewing and visualization. Creo also provides an unprecedented level of interoperability — data moves seamlessly between apps and modeling modes while retaining design intent — such that companies can share data more easily with internal and external parties. By delivering new apps with seamless interoperability, Creo enables companies to make dramatic improvements in their engineering, manufacturing and service processes.



COURSE CONTENTS

Interface of Creo.

Sketch.

Part.

Assembly.

Sheet metal.

Surface.

Rotational bends.

Drafting.

Geometric tolerance. eBOM.

Generating balloons.

CREO SIMULATE

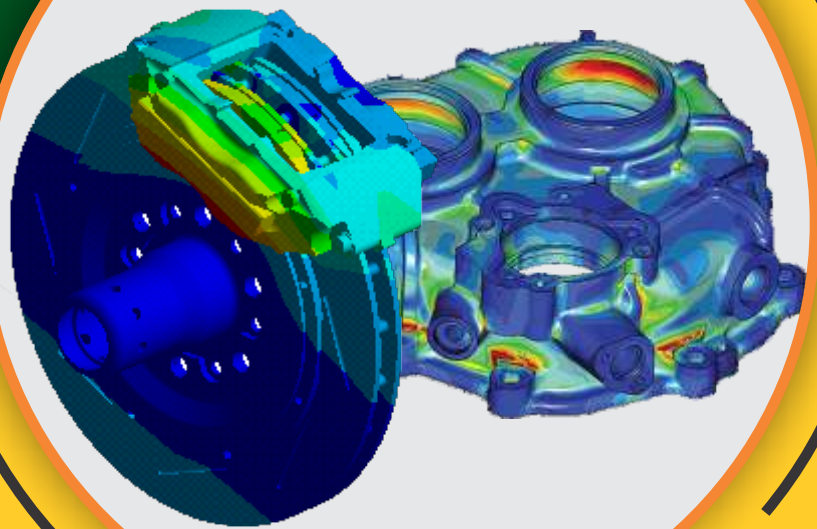
COURSE DURATION : 30HRS

SUMMARY:

Creo Simulate is a multi-discipline CAE (Computer Aided Engineering) tool with which you can simulate the physical behavior of a model and understand and improve the mechanical performance of your design. You can directly calculate stresses, deflections, frequencies, heat transfer paths, and other factors, showing you how your model will behave in a test lab or in the real world.

The product line features two modules- Structure and Thermal-each of which solves for a different family of mechanical behaviors. Structure focuses on the structural integrity of your model, while Thermal evaluates heat-transfer characteristics.

There are two basic modes, integrated mode and standalone mode. In integrated mode, you perform all Creo Simulate functions within Creo Parametric. This version of the product offers the convenience and power of Creo Parametric's parametric feature-creation technology coupled with the full range of Creo Simulate's solution software.



COURSE CONTENTS

Fundamentals of Creo simulate

Preparing a CAD model

Pre-processing

Meshing

Structural static analysis

Model analysis

Symmetry

Thermal

Assembly analysis

Optimization study

SOLID EDGE

COURSE DURATION : 40HRS

SUMMARY:

Solid Edge is a 3D CAD, parametric feature (history based) and synchronous technology solid modeling software. It runs on Microsoft Windows & provides solid modeling, assembly modelling & 2D orthographic view functionality for mechanical designers. Through third party applications it has links to many other Product Lifecycle Management (PLM) technologies Solid Edge is a direct competitor to Solidworks, Creo, Inventor, IRONCAD, etc.

Solid Edge integrates with Windows Indexing, Share Point or Teamcenter to provide product lifecycle management. Solid Edge also integrates with PLM products from third parties. Solid Edge ST9 brought a new data management capability that leverages the Windows file indexing service to add basic data management functionality without the need for an additional server or set-up.

Solid Edge provides support for Finite Element Analysis (FEA) starting with Solid Edge ST2 version released in 2009. This functionality is based on Siemens PLM's existing Femap & NX Nastran technologies. From Solid Edge 2019 there was also Computational Fluid Dynamics functionality added from Mentor's FloEFD, and with Solid Edge 2020 Rigid Body Motion, Transient Dynamic analysis was added.



COURSE CONTENTS

Introduction to solid edge

Sketch

Advance sketch tools

Part modelling

Difference between ordered & synchronous modelling

Advance modelling tools

Introduction to assembly

Advance assembly relationships

Drafting

Title block, tables and sheets

Sheet metal design import/export cad files to another format

NX CAD

COURSE DURATION : 40HRS

SUMMARY:

NX CAD software package originally developed by Unigraphics, But since 2007 managed by Siemens PLM software. NX enables you to freely use any modeling approach that fits your design challenge. With the industry's most powerful and versatile CAD modeling tools, you can create and edit geometry with greater speed and flexibility.

Unlike CAD-only solutions and closed enterprise solutions, NX delivers the highest integration between development disciplines in an open, collaborative environment. You can work faster and more efficiently in the full range of design tasks, from 2D layout through 3D modeling, assembly design, drafting and documentation.

NX design tools are superior in power, versatility and productivity. You can work faster and more efficiently in the full range of design tasks, from 2D layout through 3D modeling, assembly design, drafting and documentation. NX assembly design tools are ready for the most complex assemblies, even those with thousands of parts. You can create full multi-CAD digital mockups with NX to quickly identify issues and resolve problems.



COURSE CONTENTS

User Interface of NXCAD

Sketch

Modify curves

Part modelling

Design feature

Assembly

Sheet metal

Drafting

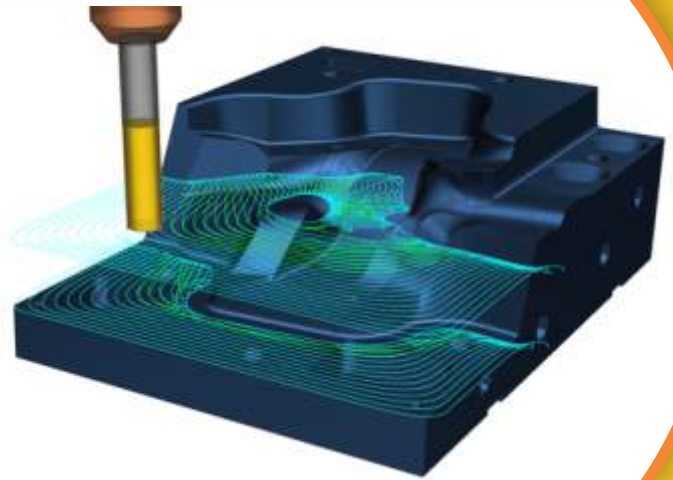
View creation wizard

Custom symbol

Drawing format

NX CAM

COURSE DURATION : 40HRS



SUMMARY:

NX CAM provides comprehensive and integrated NC programming capabilities in a single system. This enables the use of consistent 3D models, data and processes to seamlessly connect planning and shop floor operations with a digital thread.

You can streamline and automate NC programming, while reducing cycle time, using powerful, application-specific tools. From 2.5-axis machining and mold manufacturing, to simultaneous 5-axis milling and high-volume production, NX allows you to use one CAM software to make better parts faster.

COURSE CONTENTS

- Operation navigator
- Manufacturing operations & post processing
- Wizard and shop documentations
- Planar milling
- Engrave text
- Face milling cavity milling
- Z - milling
- Thread milling and grooves
- Area milling
- Radial cutting surface area cutting
- Contour profiling
- Rough and finish turning
- Center line drilling
- Multi spindles and IPW

HYPERMESH

COURSE DURATION : 40HRS

SUMMARY:

HyperMesh is the market-leading, multi-disciplinary finite element pre-processor which manages the generation of the largest, most complex models, starting with the import of a CAD geometry to exporting a ready-to-run solver file.

HyperMesh supports a wide variety of CAD and solver interfaces, making it a perfect solution for most industry verticals and domains. With its advanced geometry and meshing capabilities, HyperMesh provides an environment for rapid model generation. Generating high-quality mesh quickly is just one of HyperMesh's core competencies.



COURSE CONTENTS

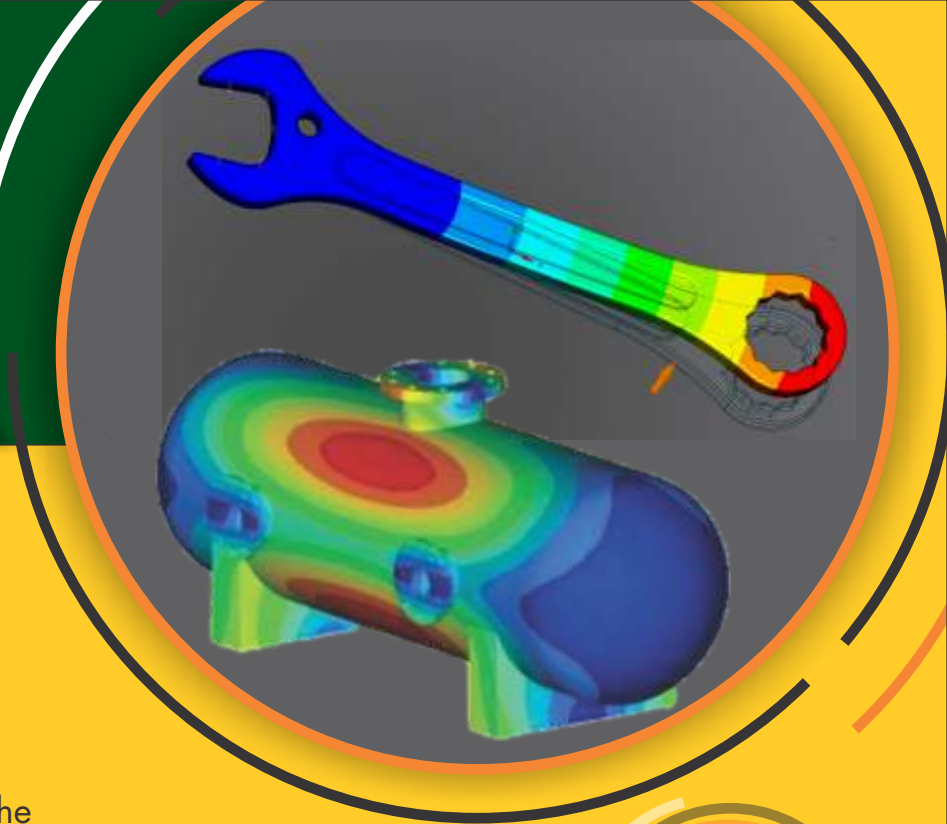
- Introduction to meshing and FEA
- Hypermesh user interface
- Preparing model for hypermesh
- Shell meshing
- Tetra meshing
- Mesh quality check
- Shrinkwrap mesh
- Assemblies: welding and swapping parts
- Analysis setup
- Hypermesh Solver interfaces
- Post processing
- Review, test and project discussion

ANSYS WORKBENCH

COURSE DURATION : 40HRS

SUMMARY:

The ANSYS Workbench platform is the backbone for delivering a comprehensive and integrated simulation system. Using Workbench for your product development simulations will result in higher productivity from integrated applications and access to multiphysics and systems level capabilities. The platform is based around an innovative project schematic view which ties together the entire simulation process. You are guided through even complex multiphysics analyses with a drag-and-drop approach to selecting the modules and capabilities required for each simulation task.



COURSE CONTENTS

- Introduction to CAE and graphical user interface of ANSYS
- General procedure involved
- FEA
- Working on model
- Cad modelling using NX
- Workbench
- Defining and assigning
- Materials
- Meshing
- Optimizing to refine mesh
- Boundary conditions
- Surface and line model
- Static structural analysis

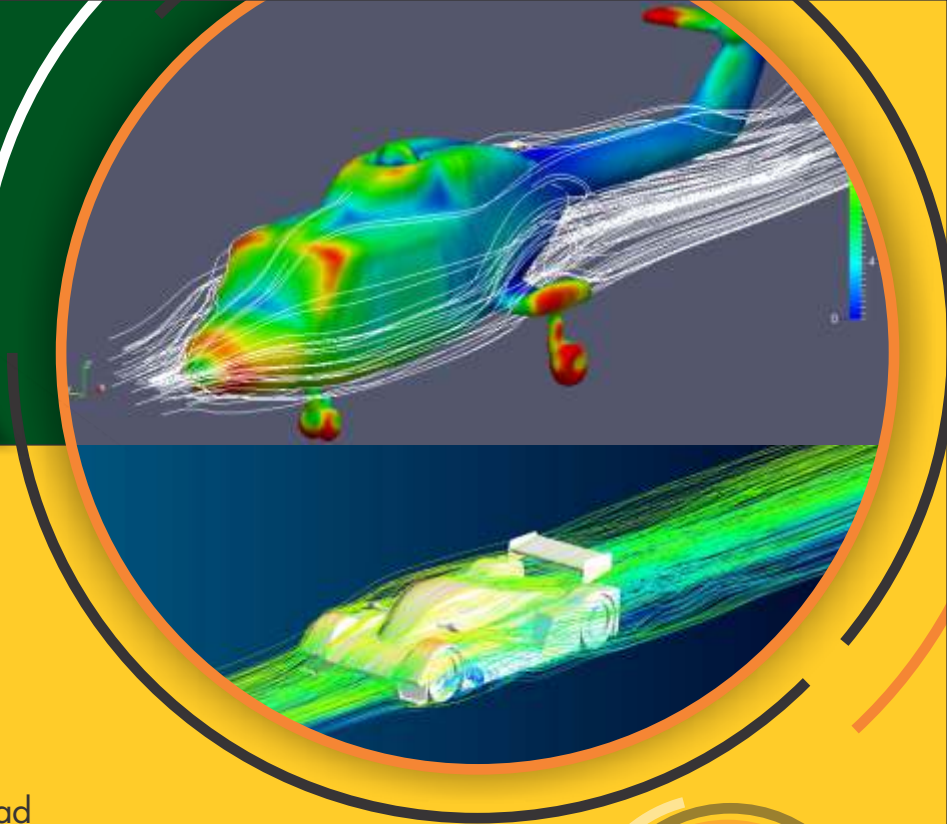
ANSYS FLUENT

COURSE DURATION : 40HRS

SUMMARY:

Ansys FLUENT software contains the broad physical modeling capabilities needed to model flow, turbulence, heat transfer, and reactions for industrial applications ranging from air flow over an aircraft wing to combustion in a furnace, from bubble columns to oil platforms, from blood flow to semiconductor manufacturing and from clean room design to wastewater treatment plants. Special models that give the software the ability to model in-cylinder combustion, aeroacoustics, turbomachinery and multiphase systems have served to broaden its reach.

Today, thousands of companies throughout the world benefit from the use of Ansys FLUENT software as an integral part of their design and optimization phases of product development.



COURSE CONTENTS

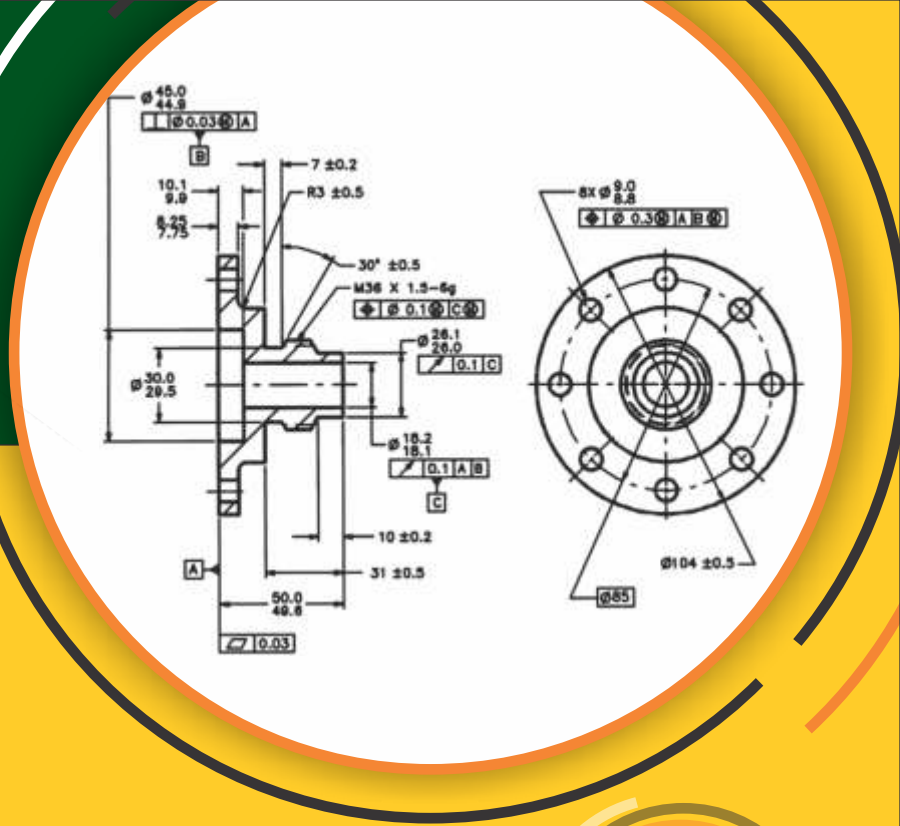
- Basic concepts of CFD
- CFD simulation
- CFD meshing
- Flow mixing
- Heat transfer
- Transonic flow Airfoil
- Multiple species
- Turbulence modeling
- Radiation and convection
- Plane frame design
- Geo technical module
- Siphoning

GD & T

COURSE DURATION : 18HRS

SUMMARY:

Geometric Dimensioning and Tolerancing (GD&T) is a system for defining and communicating engineering tolerances. It uses a symbolic language on engineering drawings and computer-generated three-dimensional solid models that explicitly describe nominal geometry and its allowable variation. It tells the manufacturing staff and machines what degree of accuracy and precision is needed on each controlled feature of the part. GD&T is used to define the nominal (theoretically perfect) geometry of parts and assemblies, to define the allowable variation in form and possible size of individual features, and to define the allowable variation between features.



COURSE CONTENTS

- Dimensions and drawings
- Tolerance dimensioning
- Ways of expressing tolerances
- 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 bonus tolerance
- Planar datums
- Modifiers and symbols
- Tolerance types
- Feature control frame