

CAD (Module-2) Course



OUTLINE:

- Understanding the curvature continuities
- Difference between solid and surface modeling
- Creating the wireframes
- Create and manage a surface model
- Dress up the surface model
- Modify the surface models
- Transform the surface model
- Bifurcate the surface model
- Constraint management
- Design parts in the context of an assembly
- Top-Down and Bottom-Up Assemblies
- Degrees of freedom
- GD&T for assembly
- Re-use existing data to complete assemblies
- Manage relationships between assembled parts
- Analyze and annotate your design
- Use of library and catalogues
- Rendering
- Tips & Tricks for advance users



LEARNING OUTCOMES:

After accomplishing this course, student will be able to understand:

- Surface modeling techniques
- Assembly of different parts

WHO SHOULD ATTEND?

Designers, Engineers, Diploma Holders, Automotive vendors, Anyone who wants to start the career as Tool Designer

PRE-REQUISITE:

CAD Module-I
Technical Background

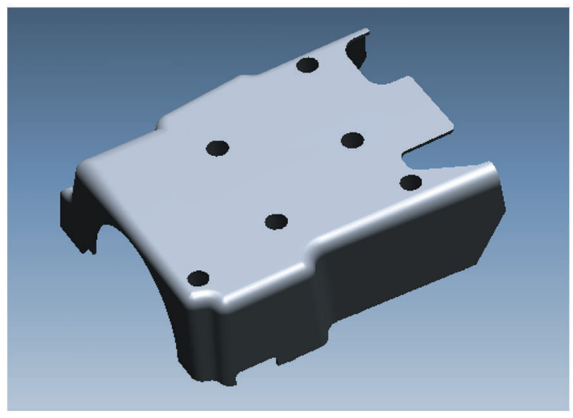
PROJECT:

Modeling of a part and assemble different components



OUTLINE:

- Elements of a perfect Design
- Getting familiar with user interface
- Introduction to Datum (Lines, Planes, points etc.)
- Coordinate systems
- Parametric modeling and Associativity
- Understand the basics of sketcher environment
- Create sketch geometry
- Analyze sketch geometry
- Edit existing profiles
- Dimensioning the sketched geometry and modify it with constraints
- Create and manage a solid model
- Modify the solid models
- Transform the solid model
- Dressing up the solid model
- Generate drawings from part model
- Ballooning and Bill of material generation
- Creating GD&T in drawing
- Manage sketches within a 3D environment



LEARNING OUTCOMES:

After accomplishing this course, student will be able to understand:

- Sketching
- 3D Solid Modeling
- Generation of part and assembly drawings

- Designers, Engineers, Diploma Holders, Automotive vendors, Anyone who wants to start the career as Tool Designer

PRE-REQUISITE:

- Able to understand Engineering Drawing

PROJECT:

- Sketch, model and draft the part using its drawing



CNC MACHINE OPERATION COURSE



OUTLINE:

- Introduction to CNC
- CNC Machine Operator Responsibilities & Deliverables
- Understanding the Controller
- Understanding G&M Codes
- Simulating G&M Codes
- Addresses & Commands
- Introduction to Tool Geometry
- Aligning the Job
- Clamping and Setting the Job
- Selecting the Proper Mode
- Practical Training on Machines with Fanuc Controller
- Understanding the Alarms



LEARNING OUTCOMES:

After accomplishing this course, student will be able to understand:

- Difference between CNC and conventional machines
- How to use right machine and the right tool for a specific operation
- The job order
- How to run, handle and manage the machine
- Basic trouble shooting and identification of alarm
- Use of coolant
- How to prepare for CAM programming

WHO SHOULD ATTEND?

- Designers, Engineers, Diploma Holders, Automotive vendors, Anyone who wants to start the career as Tool Designer

PRE-REQUISITE:

- No pre-requisite

PROJECT:

- Machine the 2D profiles on a block using manual programming on CNC machining centre

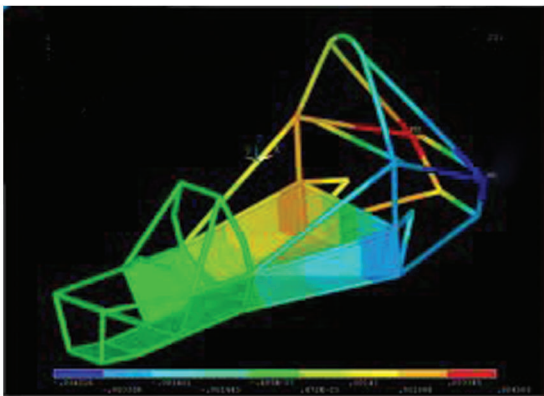
BASIC FEA COURSE

(ANSYS Parametric Design Language)



OUTLINE:

- Basics of FEM.
- Introduction to ANSYS.
- General Pre Processing.
- Solution Phases.
- Modeling (2D and 3D), Material, Meshing, Loading and Solution.
- Post Processing.
- Static Structural Analysis.
- Constraint Equations.
- Parameters.
- Macros.
- Modal Analysis.
- Linear Buckling Analysis.



ANSYS®

LEARNING OUTCOMES:

After accomplishing this course, student will be able to understand:

- Basic Concept of FEM
- Pre-processing, solution and post processing phases
- Steps involved in structural analysis

WHO SHOULD ATTEND?

- Designers, Engineers, Diploma Holders, Automotive vendors, Anyone who wants to start his career as Analyst

PRE-REQUISITE:

- CAD Module-I, Differential Equation, Matrices
- Technical Background

PROJECT:

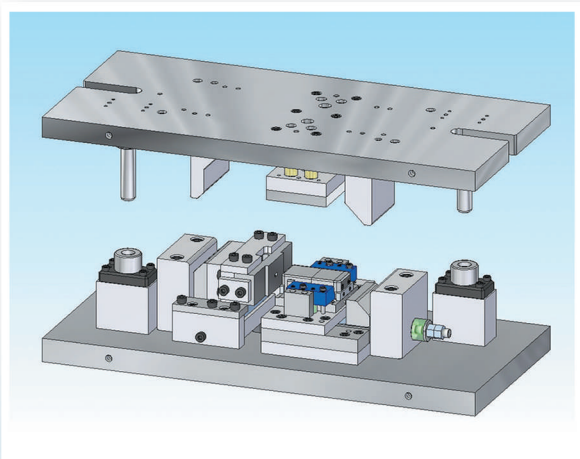
- Free Fall Motion or drop Test using ANSYS APDL

SHEET METAL DIE DESIGN COURSE



OUTLINE:

- Die Design Terminology
- Part design with sheet metal concepts
- CAD techniques for sheet metal
- Process part design
- Required input to Die Design
 - ✓ Presses
 - ✓ Materials
 - ✓ Tonnage
 - ✓ Tolerances
- Die design flow sequence
- Customizing the die design
- Sketching the die
- Spring back issues and its compensation
- Calculating the blank size
- Use of re-striking
- Machining Processes in sheetmetal
- Use of welding and insert for edges
- Modern techniques of Inspection
- Using and Accessing Die Standards
- Die Design Checklist
- Estimated Costing
- Thinning effect in part
- Draw die optimization



LEARNING OUTCOMES:

After accomplishing this course, student will be able to:

- Identify briefly the process layout of any sheet metal part
- Design the dies on CAD software
- Calculate the estimated cost

WHO SHOULD ATTEND?

- Engineers, Diploma holders, Automotive OEM and Vendors and those interested to start their career as Tool Designer

PRE-REQUISITE:

- CAD Module-II
- Technical background

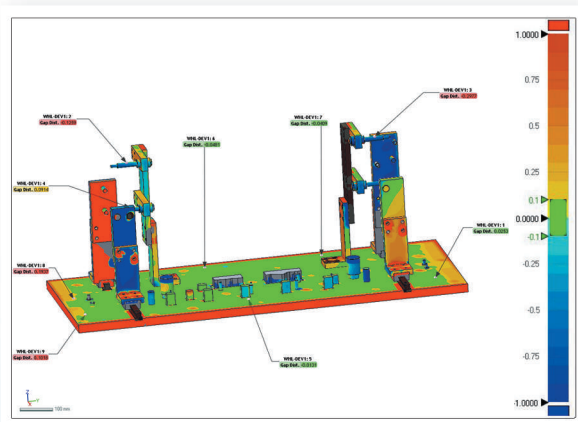
PROJECT:

- Designing the blanking, draw, & piercing die of sheetmetal part on CAD software



OUTLINE:

- Types of Jigs and fixtures
- Elements of Fixtures
- Locating Methods
- Locating Principles
- Form of locators and supports
- Clamping principles
- Type of clamps
- Materials used in Jig and fixture
- GD&T used in Jig and Fixture
- Machining Processes for Jig and Fixture
- Inspection
 - ✓ Alignment techniques
 - ✓ Position of Datum holes
 - ✓ Profile/trimming edges
 - ✓ cross-section analysis
 - ✓ Gap Analysis
- Calibration techniques of Jigs and Fixture:
 - ✓ Through CMM
 - ✓ Through Scanner
 - ~~✓ Through photo-grammetry~~



LEARNING OUTCOMES:

After accomplishing this course, student will be able to:

- Understand briefly the theoretical concepts of jigs and fixtures
- Design the checking fixture on CAD software
- Understand and practically perform the calibration of checking fixtures

WHO SHOULD ATTEND?

- Designers, Engineers, Diploma Holders, Automotive vendors or Anyone who wants to start the career as Tool Designer

PRE-REQUISITE:

- CAD Module-II
- Technical Background (Preferably QC)

PROJECT:

- Designing and calibration of checking fixture by using CAD and Inspection software

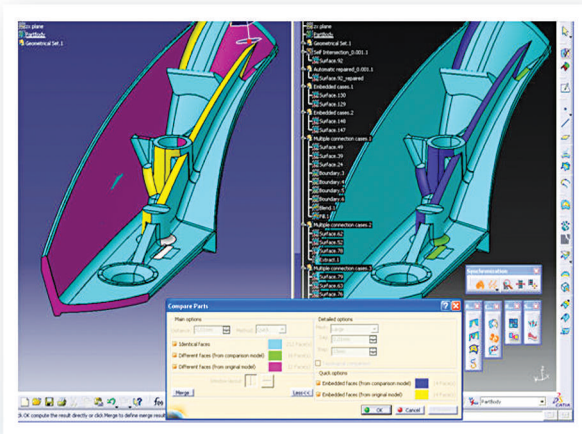


LEGACY DATA HANDLING COURSE



OUTLINE:

- Why do we need healing?
- Methodology for healing
- Analyzing the model
- Face checking
- Surface connection checker
- Checking for free sides
- Fixing for free sides
- Repairing invalid surfaces
- Understanding joining process
- How to choose the merging distance
- Local join
- Local healing
- Closing the joined surface
- Comparing the parts



LEARNING OUTCOMES:

After accomplishing this course, student will be able to understand:

- Analyse the imported data
- Repair the imported data
- Compare two versions of a part

WHO SHOULD ATTEND?

- Designers, Engineers, Diploma Holders, Automotive vendors, Anyone who wants to start his career as Tool Designer

PRE-REQUISITE:

- CAD Module-II
- Technical Background

PROJECT:

- Convert .iges data in Solid Model

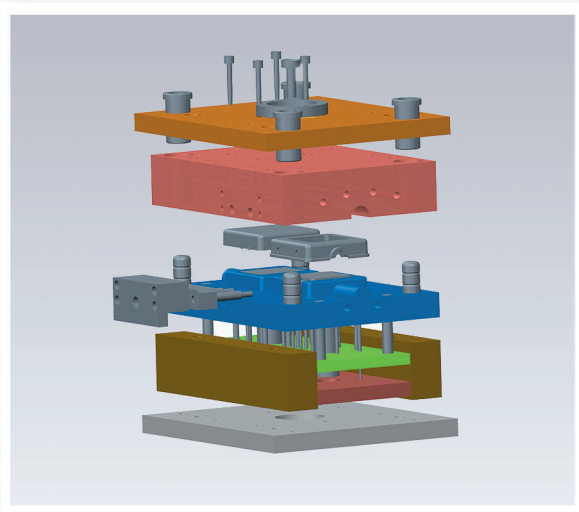


PLASTIC INJECTION MOULD DESIGN COURSE



OUTLINE:

- Theory of mould design
- Understanding the moulding process
- Types of plastic / shrinkage
- Flow behaviour of plastics
- Materials used in mould
- Components of moulds
- Theory of runner, sprue bush, gates etc
- Sliders and lifters mechanisms and extraction on CAD
- Selection and creation of Mould Base
- Designing of Ejection System
- Designing of Cooling System
- Drafting and Assembly of Mould
- Polishing
- Estimated Costing



COURSE OBJECTIVE:

After accomplishing this course, student will be able to understand:

- Plastic injection mould and materials
- Injection, ejection and cooling systems
- How to select proper mould base
- Assembly and drafting of the mould components
- Polishing techniques
- How to calculate the cost of mould

WHO SHOULD ATTEND?

- Designers, Engineers, Diploma Holders, Automotive vendors, Anyone who wants to start the career as Tool Designer

PRE-REQUISITE:

CAD Module-II
Technical background

PROJECT:

Designing of plastic injection mould on CAD software



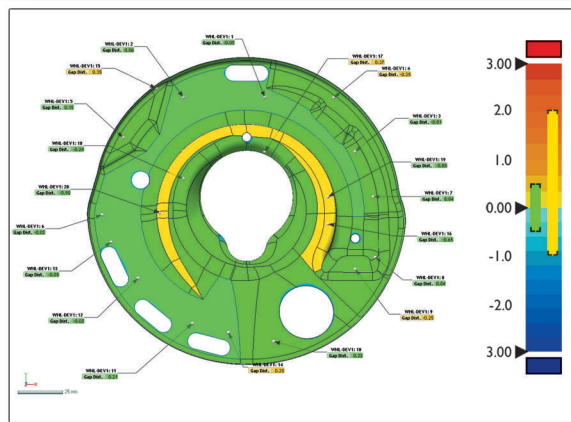


QUALITY CONTROL & INSPECTION COURSE



OUTLINE:

- Understanding Quality Control
- Difference between QC & QA
- Seven quality tools
- Inspection of Features with respect to GD&T
- How to control
 - ✓ Shape of a part
 - ✓ Size of a part
 - ✓ Functionalities of mating part
- Understanding drawings with respect to inspection
- Equipment used for Quality & Inspection
- Building the quality stations
- GOM Inspect software for Inspection
 - ✓ Understanding the interface
 - ✓ Data Import
 - ✓ Optimizing the Mesh
 - ✓ Creating the datums
 - ✓ Aligning the Job
 - ✓ Inspection Planning
 - ✓ Inspection Techniques
 - through CAD Model
 - through Drawing
 - ✓ GD&T Application
 - ✓ Creating the inspection report



LEARNING OUTCOMES:

After accomplishing this course, student will be able to understand:

- Understand the basic concepts of quality and inspection.
- Tools utilization with geometry of part
- Understand the use of latest technologies and equipments used in Inspection
- Inspection strategies with respect to drawing
- Build individual quality stations of manufacturing process

WHO SHOULD ATTEND?

- Designers, Engineers, Diploma Holders, Automotive vendors or Anyone who wants to start the career as Tool Designer

PRE-REQUISITE:

- CAD Module-I
- Technical Background (Preferably QC)

PROJECT:

- Inspecting a part using 3D scanned data





REVERSE ENGINEERING COURSE



OUTLINE:

- Getting familiar with User interface
- Understanding the methodologies of reverse engineering
- 3d scanning techniques and its effects on reverse engineering
- Understanding different strategies to develop a part
- Maintaining the accuracies during the process
- Modeling without mesh
- Understanding the point cloud data and mesh
- Region Editing
- Mesh Sketch
- Mesh Editing
- Auto-surfacing
- Freeform Surfacing
- Comparing the final part with mesh
- Live transfer capabilities to other software



LEARNING OUTCOMES:

After accomplishing this course, student will be able to understand:

- 3D scanning and reverse engineering techniques
- How to handle cloud data to develop a part
- How to compare the part with original data
- How to live transfer the final part to Pro-E and CATIA

WHO SHOULD ATTEND?

- Designers, Engineers, Diploma Holders, Automotive vendors or Anyone who wants to start the career as Tool Designer

PRE-REQUISITE:

- Basic knowledge of CAD and Reverse Engineering

PROJECT:

- End to End modeling of Brake handle

RAPIDFORM™

CNC TOOL PATH GENERATION COURSE



OUTLINE:

- Preparing the part for machining
- Defining machine
- Defining the coordinate system
- Creating the stock
- Types of Tools
- Selecting the proper tools for specific operations
- Selecting the feed rate and spindle speed with catalogue
- Selecting the proper operation for specific task
- Roughing operations
- Semi-finishing operations
- Finishing operations
- Optimizing the non-machining time
- Selecting the check surfaces
- Parameters control like depth of cut, step over etc
- Generating the output
- Analyzing the tool path
- Simulating the G & M codes/posted NC file.

LEARNING OUTCOMES:

After accomplishing this course, student will be able to understand:

- Different operations used in CAM
- How to use right tool for specific operation
- Selecting the feed and speed from catalogue
- Analyze the tool path and simulate its posted NC file

WHO SHOULD ATTEND?

- Designers, Engineers, Diploma Holders, Automotive vendors, Anyone who wants to start the career as Tool Designer

PRE-REQUISITE:

- CNC Machine operation course
- CAD Module-I course

PROJECT:

- Machine the cavity of connecting rod

