SPEED LEARNING CENTRE

Industry Oriented Courses in

Product Design and CAD

Finite Element Analysis (FEA)

About Speed Engineering Solutions

- Speed Engineering is an **ISO 9001:2015** certified organization having offices in **India, UK and US.**
- Speed Engineering offers high-end engineering solutions and services in multiple domains including **Automotive, Aerospace, Industrial and Turbo-machinery products.**
- Speed Engineering's service portfolio includes **Product Design, Computer Aided Design and Drafting (CAD), Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD)** and niche services such as **Rotor Dynamics and Failure Investigations.**
- Speed Engineering also offers **Industry-oriented** intensive training courses for candidates aspiring to make a career in Design and FEA field.
- These comprehensive training courses are well structured to suit the needs of the industry and are imparted by **experienced professionals from the product design, development and simulation field.**

Product Design and CAD Courses

Course Code	Course Name	Software	Eligibility Criteria	Duration (Months)
SLC – 001	Product Design – Basic and Advance	Any two of (Creo, Inventor or NX)	• Graduation / Post- Graduation / Diploma	3.5
SLC – 002	Product Design – Advance	Any of (Creo, Inventor or NX)	• Student must qualify the basic CAD test • Graduation / Post- Graduation / Diploma	2.5
SLC – 003	Product Design and FEA	Any of (Creo, Inventor or NX) + ANSYS	• Graduation / Post- Graduation / Diploma	4

Product Design

- New Product Design and Development (NPD) Process
- Design for Manufacturing (DFM), Design for Assembly (DFA) and Design for Serviceability
- Design Failure Mode Effect Analysis (DFMEA)
- Reverse Engineering
- Application of Geometric Dimensioning and Tolerancing (GD&T)

Engineering Fundamentals

- Engineering Mechanics
- Strength of Materials
- Vibrations
- Fluid Mechanics
- Heat Transfer
- Thermodynamics

Domain Knowledge

- Casting & machining
- Plastic
- Sheetmetal
- Fabrication

Manufacturing

- Instruments and Measurements
- Sessions on manufacturing processes like Casting, Forging, Machining and Fabrication

Soft Skills

- Communication skills
- Group discussion
- Presentation skills
- Interview preparation

CAD

- 3D modelling and drafting of casting, machining, plastic, sheetmetal components
- Top-down & Bottom-up assembly modeling and detailing, creation of bill of materials (BoM)
- Geometric dimensioning and tolerancing (GD&T), welding, machining symbol
- Mechanical engineering drawing reading practices
- Industry standard drafting practices and drawing templates
- 3D rendering in mechanical products
- Animation study to visualize actual working mechanical products
- Exposure to advance user defined features such as family tables, relations

Exposure to Industry Projects
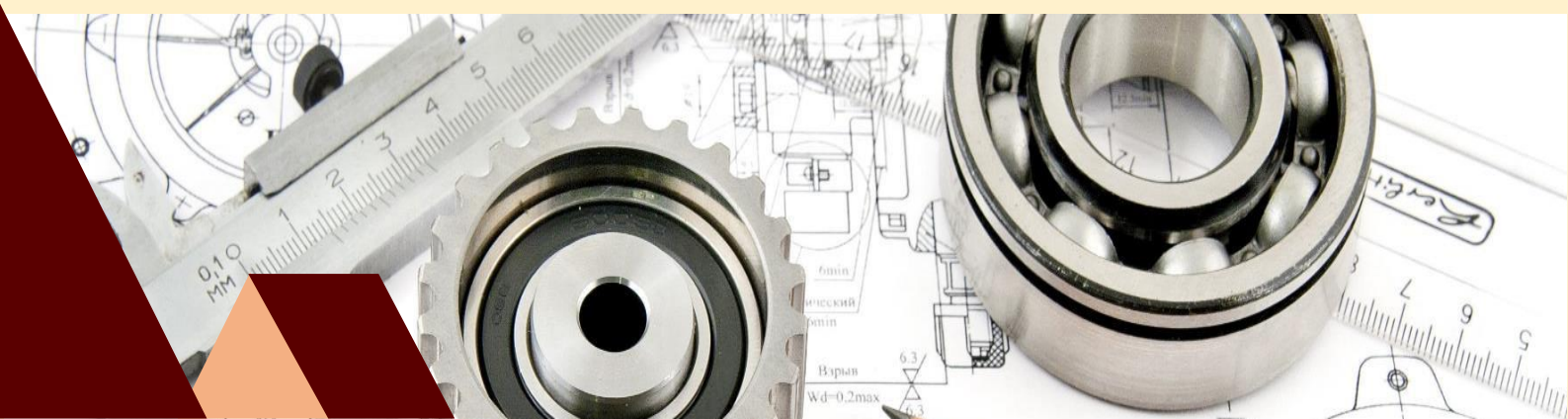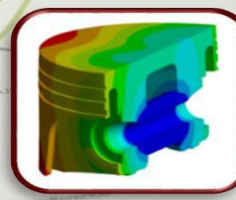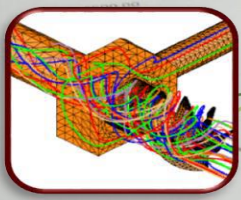
Finite Element Analysis (FEA) Course

Course Code	Course Name	Software	Content	Criteria	Duration (Months)
SLC-005	FEA - Professional	ANSYS Workbench + Spaceclaim	• Finite Element Analysis • Pre-Processor • Post Processing • Industrial Case Studies	• Graduation / Post-graduation with good academic record.	2

Finite Element Analysis

- Discretization and approximation
- Linear and quadratic shape function
- Beam, plane and shell element theories
- Introduction to the finite element method
- General steps of the finite element method
- Explanation of 1D, 2D and 3D elements with examples of ANSYS elements

Engineering Fundamentals

- Engineering mechanics
- Finite element analysis (Introduction)
- Strength of materials
- Mechanical vibrations

ANSYS – Pre-Processor

- Geometry preparation: geometry creation and clean-up, mid-surface extraction, imprints with simple case studies
- Assigning material properties
- Meshing techniques: auto, manual, global meshing controls, local meshing controls, share topology
- Contacts: linear and non-linear contacts, formulation, interface treatment etc.
- Quality check and improvement techniques

Soft Skills

- Communication skills
- Group discussion
- Presentation skills
- Interview preparation

ANSYS – Post Processing

- Animation and contour of deformation, strains and stresses, contact status etc.
- Sanity checks
- Validation of results depending on types of analysis
- Technical report preparation

Industrial Case Studies

- Plane stress, plane strain, axi-symmetric analysis
- Static structural analysis: linear and non-linear analysis
- Dynamic analysis: modal/pre-stressed modal, harmonic analysis
- Thermal analysis: steady state thermal analysis
- Transient thermo-mechanical analysis

Placement

- All courses have **Placement Assistance.**
- Placement is based on the performance of the student.

Courses Eligibility

- Diploma / BE / B. Tech / ME / M. Tech (Mechanical / Production /Automotive / Aerospace / Chemical / Petrochemical)
- Final year students undergoing Diploma / BE / ME / M. Tech in above streams
- Working professionals interested in a design, development and simulation field.

Why Speed Learning Centre

- **Speed Learning Centre is Autodesk Authorized Training Centre (ATC).**
- Comprehensive portfolio of courses that make you industry ready.
- Strong emphasis on hands-on learning for CAD & FEA tools and not just classroom trainings.
- Opportunity to interact and learn directly from accomplished industry professionals
- Syllabus designed to give exposure to real-life parts and systems.
- Learn design features by inspecting and handling physical parts.
- Get deep insights into the product design processes used in the industry.
- Exposure to live projects and industry standard modelling, drafting and simulation practices.
- Refresher on engineering fundamentals and its application to design and development process.
- More than 100+ engineers trained till date are advancing in their professional careers using the strong skillsets acquired through our training courses.