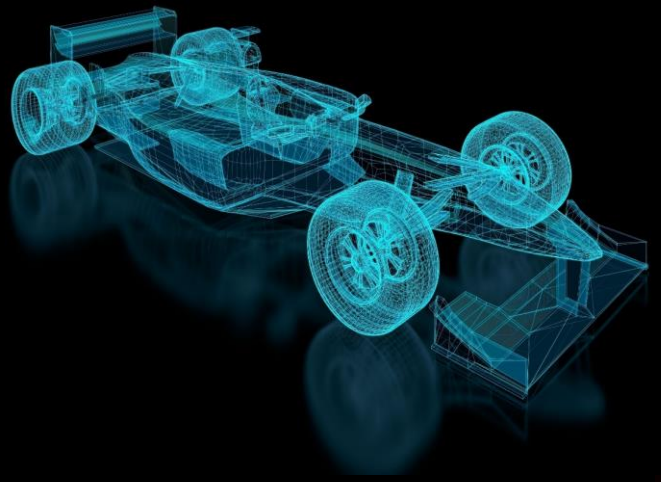
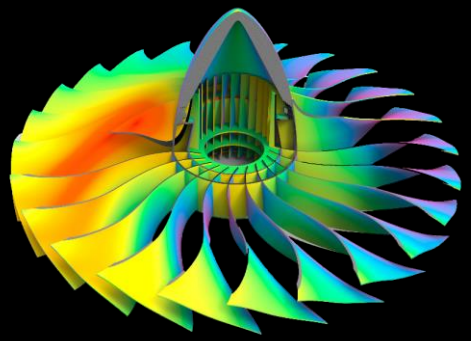
FEA ACADEMY
www.fea-academy.com

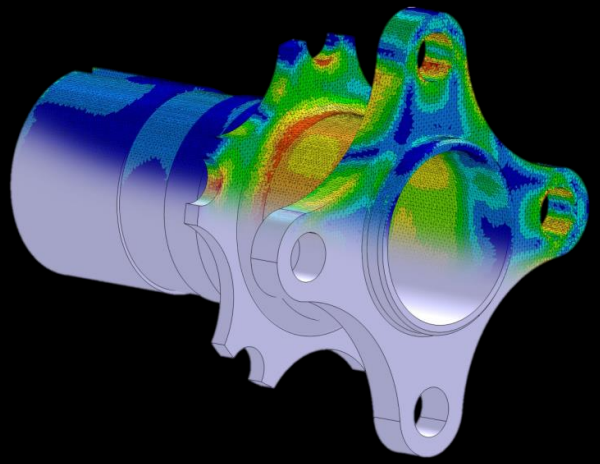
Basics of Finite Element Analysis in Electric Vehicle

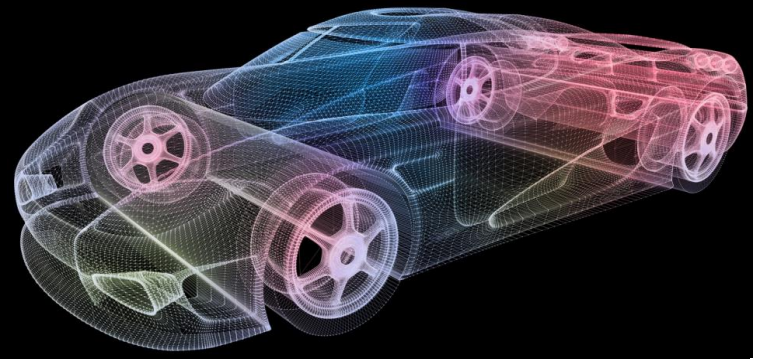
Course at 1000 Rs

TESLA EV ACADEMY®









Dominique Nadier
FEA Analyst

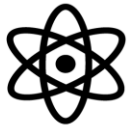
Practical Basic Finite Element Analysis

Course objectives:

- To offer *the best practical methods and guidelines* for the development and validation of finite element models in solid mechanics and structural analysis.
- To give mechanical structural engineers *the keys to developing* accurate and reliable finite element models by avoiding the most frequent errors.

FEA Academy will deliver you real and practical knowledge that you need day-to-day to solve solid mechanics and structural problems using Finite Element Analysis.

Practical Basic Finite Element Analysis



Because learning FEA is lot more than just learning a software

it is also about learning the good modeling practices and methods

Live Online Course on WebEx Training

- ✓ You can attend the live sessions, or watch the recordings at your convenience.
- ✓ Recordings available after each live session.
- ✓ Automatic email notification.

What is the prerequisite to attend the course?

- ✓ The prerequisite to attend this course is a robust general physics background.
- ✓ A review of university-level in solid mechanics, statics & strength of materials is recommended.

6 Sessions - 3.5/4 Hours per Session (with Q&A) Once a week during 6 weeks

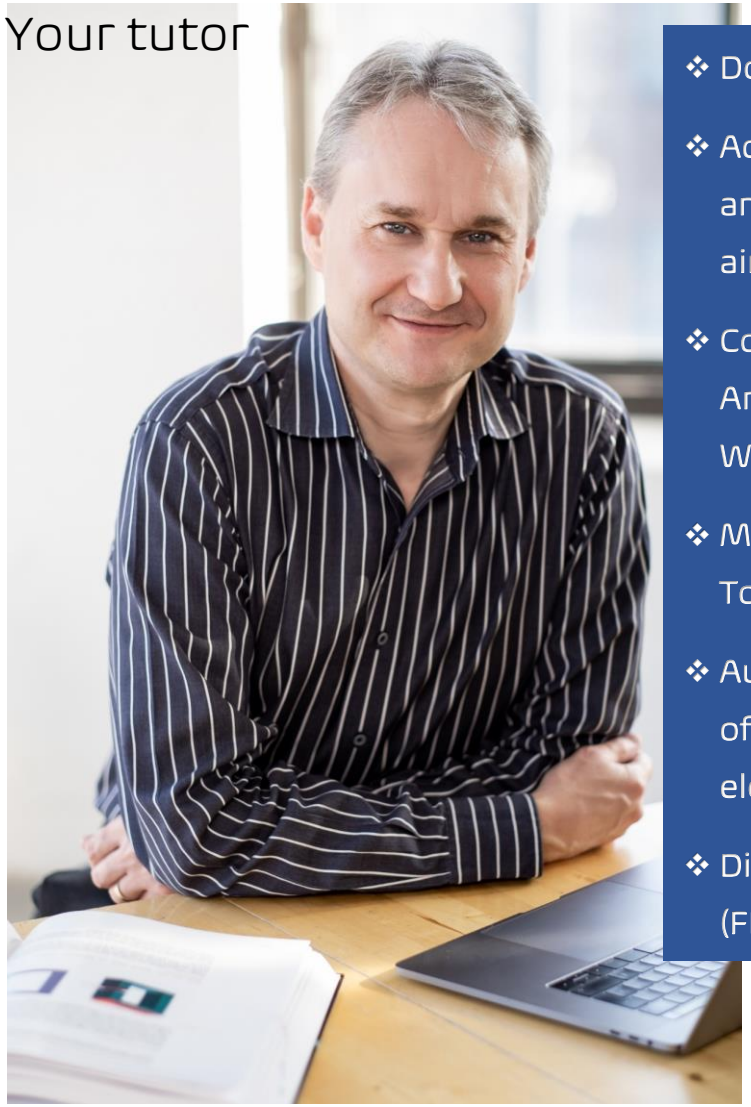
- ✓ The course is completely software independent.
- ✓ All the FEA concepts will be illustrated with examples.
- ✓ FEA Academy will issue a certificate to each registered attendee at the end of the course.

Who Should Attend?

- ✓ Engineers who want to move into the domain of FEA.
- ✓ Engineers who need a refresher to brush-up their knowledge.
- ✓ New graduates who want to learn how FEA is applied in the real life to solve solid mechanics and structural problems.

Practical Basic Finite Element Analysis

Your tutor



- Dominique Madier is a senior aerospace consultant with more than 20 years' experience.
- Advanced expertise in Finite Element Analysis (FEA) of static and dynamic problems for linear and nonlinear structural behaviors on aerospace metallic and composite structures such as aircraft fuselage, wings, nacelle, engine pylon, helicopter airframe, and systems.
- Conducted detailed finite element analyses for aerospace companies in Europe and in North America: Airbus, Dassault Aviation, Safran, Bell Helicopter, Bombardier Aerospace, Pratt & Whitney Canada, and their subcontractors.
- Master's degree in Mechanical and Aerospace Engineering from Paul Sabatier University, Toulouse, France.
- Author of the book "Practical Finite Element Analysis for Mechanical Engineer". 650+ pages offering the best practical methods and guidelines for the development and validation of finite element models.
- Director of FEA Academy, Montreal, Canada.
  (FEA Consulting & FEA Training).

Dominique Madier
FEA Analyst

Agenda of the Course

Session #1

Presentation & Introduction

What is Finite Element Analysis (FEA)?

- Methods for Solving an Engineering Problem
- The Different Numerical Methods
- Introduction to Partial Differential Equations
- So, What is FEA?

Working with FEA in Mechanical and Structural Analysis

- How FEA Can Help You?
- The FEA Process
- Capabilities of FEA Software
- How Accurate is FEA?
- Why Do FEA?
- What is Needed to Perform an FEA Simulation?

Q&A

How to Learn FEA

- The Three Stages of the FEA Learning Process
- The Main Rule of FEA Learning
- What is the Main Danger of FEA
- What Do You Need to Learn in the FEA Field?
- My 10 Guidelines for FEA Learning
- The Five Advantages of Learning FEA

Q&A

Defining Your FEA Strategy

- The 10 Steps to follow to Build an FEA Strategy
- The 14 Questions to Ask Before to Start Modeling

Q&A

Agenda of the Course

Session #2

THE BASIS OF FEM THEORY

- The Equilibrium Equation
- The Displacement Method
- What is a Degree of Freedom?
- What is a Shape Function?
- What is the Stiffness Matrix?
- Elements Stiffness Matrix for Various Topologies
  i. 1D Truss Element
  ii. 1D Beam Element
  iii. 2D Elements
  iv. 3D Solid Elements
- How the Global Stiffness Matrix of the Complete Problem is Assembled?
- How the FEM Equations are Solved ?

Q&A

THE LIBRARY OF ELEMENTS

- Type of Elements Used in FEA (1D, 2D & 3D)
- Element Selection Criteria
- Linear and Quadratic Elements
- How to Choose the Right Element
- Integration Schemes
- Shear Locking, What is it and How to Prevent it?

Q&A

Agenda of the Course

Session #3

Meshing

- Plan the Meshing
- Define the Elements Size
- Mesh Refinement (Why & How)
- 1D Meshing Rules
- 2D Meshing Rules
- 3D Meshing Rules
- Physical Interfaces and Mesh Transition
- How to Check Your Mesh?
- Various Recommendations for Meshing

Q&A

Defining Loads and Boundary Conditions

- What is a Boundary Condition?
- Why Do You Need Boundary Conditions?
- The Different Types of Boundary Conditions
- Constrain a Model
- Strategy to Define Boundary Conditions
- How to Create Isostatic Restraints
- Over-Stiffening and Under-Stiffening Problems
- About Singularities
- Type of Loadings

Q&A

Agenda of the Course

Session #4

Rigid Body Elements & Multi-Point Constraint

- Terminology
- Why to Use Rigid Elements
- Rigid Body Elements (RBE's)
- Constraint Element (MPC)

Q&A

Modeling Bolted Joints

- Bolt Behaviors
- Do you Really Need to Model the Bolts?
- Fasteners modeled with Rigid Elements
- Fasteners modeled with 1D Spring Elements
- Fasteners modeled with Beam Elements
- Fasteners Stiffness Calculation
- How to Connect the Fasteners to the Surrounding Mesh?
- How to Capture the Prying Effect with 1D Spring Elements?
- Modeling the Bolt Preload

Q&A

Agenda of the Course

Session #5

Submodeling

- What is Submodeling?
- Why Do Submodeling?
- How to Do Submodeling
  i. Submodel a Global FEM
  ii. Extract a Part of the Global FEM
- Tips and Hints for Submodeling

Q&A

Verify & Validate Your FEA

- Accuracy Checks
- Mathematical Validity Checks
- Correlation

Q&A

Understanding FEM Outputs

- Standard Outputs
  i. Deformations
  ii. Element Force
  iii. Freebody Diagram
  iv. Stresses
- The Basic Rules of Post-Processing
- How to Deal with Singularities in Stress Models

Q&A

Agenda of the Course

Session #6

Overview of the Basic FEA Solutions in Solid Mechanics

Linear Static Analysis

- What is Linear Static Analysis?
- How to Solve a Linear Static Analysis
- Characteristics of a Linear Static Analysis
- Outcomes

Linear Buckling Analysis

- What is Linear Buckling Analysis?
- Assumptions and Limitations of LBA
- Outcomes

Q&A

Normal Mode Analysis

- What a Mode is and What a Mode is Not
- Why Compute Modal Analysis?
- Outcomes

Introduction to Nonlinear Analysis

Q&A

Practical Basic Finite Element Analysis

Agenda of the Course

Session #7

OVERVIEW OF FEA IN ELECTRIC VEHICLE

Q&A

Make Payment by Google Pay/PhonePe

UPI ID - easypay1058@icici