



Autodesk Inventor Nastran: Advanced FEA

Course Length: 1 Day

The Autodesk Inventor Nastran: Advanced FEA training course instructs you in the use of the Autodesk® Inventor® Nastran® software. This training course was written using the 2021.1.0.407 build of the software. The software is a finite element analysis (FEA) tool that is embedded directly in the Autodesk® Inventor® software as an Add-In. It is powered by the Autodesk Nastran solver and offers simulation capabilities specifically tailored for designers and analysts as a tool for predicting the physical behavior of parts or assemblies under various boundary conditions. Through a hands-on, practice-intensive curriculum, students acquire the knowledge required to work in the Autodesk Inventor Nastran environment to set up and conduct FEA on part and assembly models.

Topics Covered:

- Activate and navigate the Autodesk Inventor Nastran environment to conduct FEA.
- Create, edit, and assign idealizations and materials (linear, nonlinear, and composites).
- Manage the creation, setup, and modification of analyses and subcases that are used to analyze both static and dynamic models. Specific analyses types that are covered in this training course include:
 - Nonlinear Static
 - Nonlinear Transient Response
 - Normal Modes
 - Direct Frequency Response
 - Modal Frequency Response
 - Direct Transient Response
 - Modal Transient Response
 - Random Response
 - Shock/Response Spectrum

Course description shown for Autodesk Inventor 2021. Topics, curriculum, and/or prerequisites may change depending on software version.

- Create constraints with the required degrees of freedom and assign them to entities.
- Create loads that accurately represent the magnitude and location of the loads the model will experience in the working environment.
- Create Connector elements to simulate how a physical connector such as a rod, cable, spring, rigid body, or bolt will affect the model.
- Create Surface Contact elements to define contact between interacting components.
- Assign global and local mesh settings.
- Run an Autodesk Inventor Nastran analysis.
- Review and create result plots for analyzing the results.

Prerequisites:

- This training course assumes that you have Finite Element Analysis (FEA) knowledge, can interpret results, and in general, know how a model should be set up for an analysis.
- This training course was written using the 2021.1.0.407 build of the software. The user-interface and workflow may vary if older or newer versions of the software are being used.

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Learning Guide Contents

Chapter 1: Nonlinear Materials

- Lesson: Working with Nonlinear Materials
- Exercise: Flexural Test Fixture

Chapter 2: Nonlinear Transient Response Analysis

- Lesson: Creating a Nonlinear Transient Response Analysis
- Exercise: Ball Impact

Chapter 3: Normal Modes Analysis

- Lesson: Basics of a Dynamic Analysis
- Lesson: Creating a Normal Modes Analysis
- Exercise: Muffler I - Determining Natural Frequencies
- Exercise: Muffler II - Modal Avoidance

Chapter 4: Frequency Response Analysis

- Lesson: Creating a Frequency Response Analysis
- Exercise: Muffler III - Frequency Response

Chapter 5: Transient Response Analyzes

- Lesson: Creating Direct & Modal Transient Response Analysis
- Exercise: Wing

Chapter 6: Random Response Analysis

- Lesson: Creating a Random Response Analysis
- Exercise: Muffler IV - Random Response

Chapter 7: Shock/Response Spectrum Analysis

- Lesson: Creating a Shock/Response Spectrum Analysis
- Exercise: Multi-Story Building

Appendix A: Dynamic Analysis Theory

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