COURSE

Introduction to Femap with NX Nastran

Level   Foundation
Duration   4 day
Language   English or Dutch
Location   Delft, or on-site

Description

This course provides the engineer who is new to Femap and the NX Nastran solver with a substantial introduction to the software, its structure, capabilities, and how to take advantage of its efficiency and strengths. Furthermore the course covers the details of the structural analysis process to define loads and boundary conditions, FEA model checking and solving, and interpreting the results.

Aim of training

After the training, the trainee is capable of performing a finite element analysis with Femap/ NX Nastran and to evaluate the results independently.

Topics

- Introduction to static finite element analysis
- Overview of Femap functions and workflows
- Femap user interface and online help
- Importing, creating and editing geometry for meshing
- Materials and properties
- Meshing creation and editing
- Constraints and loads types
- Model verification and checking
- Model display and organization
- Visualizing and documenting results
- Assembly modeling

Students receive a full set of lecture notes and a certificate on completion.

Who should attend?

The target audiences for this training course are structural/ FEM engineers, designers, and analysts wishing to understand how to perform linear static analysis using Femap with NX Nastran.

Interested? Sign up on www.femto.eu or send your training request to info@femto.nl.

About us

At Femto Engineering we help companies achieve their product innovation goals with FEA & CFD consulting, software, training, support, deployment and R&D. We are the CAE partner of Siemens PLM Software in the Benelux and an authorized distributor for Femap, NX Nastran, Simcenter 3D and SDC verifier.

Directions

Our address is: Oude Delft 137, Delft. By car: follow the parking signs to the Phoenixgarage (Phoenixstraat 29). Leave the "centrum" exit from the parking, it's one of the first building you see on the right. When you arrive by train, it's a 5 minute walk via the Westvest and the Binnenwatersloot to the Oude Delft.

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COURSE

Femap 11.4 Update

Level	Foundation
Duration	Half a day
Language	English or Dutch
Location	Delft, or on-site

Description

Siemens PLM Software introduces a full new version of Femap and NX Nastran with new features and capabilities every year. Femap 11.4 is the latest release of Femap containing many features and enhancements requested by Femap users worldwide. To maximize the value of the new functionalities, and to keep up with the latest technological developments of Femap, we recommend users of Femap to participate in the Femap 11.4 Update Training.

Aim of training

Our aim is to offer you a fast, practical and effective way to increase your skill level and productivity when you work with Femap 11.4.

Topics

Femap 11.4 has many significant enhancements. The following main features will be covered in detail:

- Automatic rigid element updates
- Draw/Erase workflow
- Automatic geometry splitting at intersections
- Updates in charting
- High performance data mapping
- Femap Tip & Tricks (Old and new)

Who should attend?

The target audiences for this training course are structural/ FEM engineers, designers, and analysts who want to learn the details of the new Femap v11.4 capabilities.

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COURSE

Femap with NX Nastran refresher course

Level Foundation
Duration 1 day
Language English or Dutch
Location Delft, or on-site

Description

This course is designed for those who are familiar with Femap and NX Nastran, but didn't work with the program for a while. Instead of following the whole introductory course, this shortened course is a 1 day intensive boot camp solution that will equip you with all the essential skills and knowledge again.

Aim of training

After the training, the trainee is capable of performing a finite element analysis with NX Nastran and to evaluate the results independently.

Topics

- Introduction to static finite element analysis
- Overview of Femap functions and workflows
- Femap user interface and online help
- Importing, creating and editing geometry for meshing
- Materials and properties
- Meshing creation and editing
- Constraints and loads types
- Model verification and checking
- Model display and organization
- Visualizing and documenting results
- Assembly modeling

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Femap with NX Nastran on the job training

Level   Foundation/advanced
Duration   Depends on request
Language   English or Dutch
Location   Delft, or on-site

Description

Sometimes you need an extra pair of eyes to verify your analysis process. Maybe you need help on how to interpret the results, or you want to use a software capability you never used before. Our trainers can help you with all these requests. The Femap with NX Nastran on the job training will be tailored around your or your team's needs to finish engineering projects successfully now and in the future.

Aim of training

Our aim is to offer you a fast, practical and effective way to increase your skill level and productivity when you work with Femap and NX Nastran on a project.

Topics

Topics will be decided on in collaboration with the customer, but can range from:
- Model checking and verification
- Convergence/ solver settings
- Contact analysis
- Nonlinear analysis
- Dynamic analysis
- Thermal analysis
- Material nonlinearity
- And more

Who should attend?

The target audiences for this training course are structural/ FEM engineers, designers, and analysts who want on the job training of Femap with NX Nastran.

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Basic nonlinear analysis with NX Nastran

Level Advanced
Duration 1 Day
Language English or Dutch
Location Delft, or on-site

Description

NX Nastran has a nonlinear solver that is capable of solving simple nonlinear problems. This course is designed to teach you to recognize nonlinear situations and properly act on them with the NX Nastran nonlinear solver. The students receive a full set of lecture notes and a certificate on completion.

Aim of training

After the training, the trainee is capable of recognizing situations in which nonlinear calculations are required, knows how to properly adjust those calculations in NX Nastran (with Femap) and interpret the measured results independently.

Topics

- The difference between linear and nonlinear calculations
- Geometric non-linear calculations
- Material non-linear calculations
- Difference between linear and nonlinear contact
- Non-linear contact model using gap elements
- Computation of buckling problems
- Setting the right parameters
- interprets the measured results
- Plotting the results

Who should attend?

This course is intended for NX Nastran users who are experienced in the use of linear finite element calculations and want to expand their knowledge of nonlinear calculations.

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Advanced nonlinear analysis with NX Nastran

Level   Advanced
Duration   2 days
Language   English or Dutch
Location   Delft, or on-site

Description

The **Advanced nonlinear** course is a comprehensive presentation of the nonlinear capabilities available in NX Nastran's Advanced Nonlinear solver. Nonlinear topics include large displacement, large strain, nonlinear materials (plasticity, hyperelastic), and contact. The supported elements, materials, and boundary conditions are presented along with the formulations and solution schemes. Tips on solving convergence difficulties are also presented. The hands-on activities and case studies are presented using Simcenter for the pre- and post- processor (Femap).

Aim of training

After the training, the trainee is capable of setting up nonlinear calculations in NX Nastran Advanced Nonlinear solver and is able to interpret the measured results independently.

Topics

- Overview of the NX Nastran Advanced Nonlinear solver
- Model definition elements, materials, boundary conditions, contact
- Formulations and solution schemes for SOL 601 & SOL 701
- Element formulations
- Modeling contact problems
- Resolving convergence difficulties
- Case studies and hands-on activities

Who should attend?

This course is intended for users who will be using NX Nastran Advanced Nonlinear solver to perform nonlinear analyses to predict structural behavior under steady state and transient conditions.

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COURSE

Dynamic analysis in NX Nastran

Level	Advanced
Duration	1 day
Language	English or Dutch
Location	Delft, or on-site

Description

The **Dynamic Analysis** course introduces the dynamic capabilities available in NX Nastran. It covers the fundamental methods for solving for dynamic response, focusing on modal analysis. There is an emphasis on practical applications and enhancing the students' engineering judgment with respect to dynamic response. The fundamentals of structural dynamics theory are reviewed and the numerical methods used to solve them are presented.

The course covers the linear dynamic response capabilities of NX Nastran, including normal modes analysis, transient and frequency response, residual vectors, and enforced motion. A variety of hands-on workshop exercises supplement the lecture content. The class is focused on NX Nastran and most of the material applies independently of pre- or postprocessor. However, additional material is available for demonstration of use with Femap.

Aim of training

After the training, the trainee is capable of performing a dynamic analysis with NX Nastran and to evaluate the results independently.

Topics

- Normal Modes Analysis
- Model Mass
- Damping
- Transient Analysis
- Frequency Response Analysis
- Residual Vectors
- Enforced Motion

Who should attend?

This course is intended for designers, engineers and finite element analysts who will be using NX Nastran to perform dynamic analyses to predict structural behavior under steady state and transient conditions.

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Thermal analysis in NX Nastran

Level   Advanced
Duration   1 day
Language   English or Dutch
Location   Delft, or on-site

Description

The Thermal analysis course introduces product simulation and analysis in NX Nastran (with Femap) for thermal applications. This course is intended users who want to learn how to analyze specific cases of thermal models in NX Nastran. This course covers thermal topics such as duct flow, parallel processing, advanced radiation, and others.

Aim of training

After the training, the trainee is capable of performing thermal analysis with NX Nastran and to evaluate the results independently.

Topics

- Meshing and material properties
- Heat transfer introduction
- Thermal couplings
- Material transformation
- Axisymmetric analysis
- Thermal initial and boundary conditions
- Radiation
- Duct flow
- Thermal mapping
- Parallel processing

Who should attend?

This course is intended for designers, engineers and finite element analysts who will be using NX Nastran to perform thermal analyses.

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Contact analysis in NX Nastran

Level Advanced
Duration 1 day
Language English or Dutch
Location Delft, or on-site

Description

Many mechanical simulations involve parts coming into contact under load. Linear contact can be difficult to get a grasp on, but when you learn to break it down into simple components it can be a very useful technique to master. Basically it is about element faces intersecting other element faces. Advanced contact capabilities In NX Nastran (with Femap) allow you to simulate surface contact using either shell or solid elements.

Aim of workshop

After the training, the trainee is capable of correctly specifying the contact regions and the initial contact conditions for a successful contact analysis.

Topics

- Linear vs nonlinear
- Definition (Source/Target, gap elements)
- Commonly used parameters (Friction, Initial penetration)
- Other parameters (rigid, offset, compliance)
- Troubleshooting

Who should attend?

This workshop is intended for designers, engineers and finite element analysts who will be using NX Nastran to perform contact analyses.

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WORKSHOP

Material nonlinearity with NX Nastran

Level   Advanced
Duration   1 day
Language   English or Dutch
Location   Delft, or on-site

Description

Material nonlinear effects should be modeled when the material properties cannot be considered linear for the loading conditions considered. This workshop will cover the various causes for material nonlinearities, how you select an analysis model to predict the behavior and how forces and displacements translate into stress and strain distributions within the material. Examples are drawn for analyzing hyperelastic (rubber) materials or analyzing metals that exhibit plastic behavior because they are stressed beyond yield limits.

Aim of workshop

Knowing early in the design cycle when materials show nonlinear behavior leads to better design and reduced product failure later on. After the training, the trainee is able to act on nonlinear material behavior in NX Nastran (with Femap).

Topics

- Commonly used types (Isotropic, Plastic, Nonlinear elastic)
- Stress and strain evaluation (large strain, true stress)
- Rupture
- Hyperelasticity, Creep, Laminates
- Solver support

Who should attend?

This workshop is intended for designers, engineers and finite element analysts who need to understand the NX Nastran solver settings with regards to materials with nonlinear behavior.

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Convergence solutions in NX Nastran

Level Advanced
Duration 1 day
Language English or Dutch
Location Delft, or on-site

Description

Expected different results from an analysis or came across an analysis that did not converge? Many of such problems can be resolved with correct solver settings. Depending on the kind of simulation, different strategies can be chosen. Is it a static or a dynamic analysis? Is it force driven or displacement driven? Does it mainly involve plasticity, are there large displacements? Does it involve buckling to analyze the stability of the structure? Different solver parameters can be tuned to get better performance. With real-word examples we guide you through the convergence solution methods from scratch.

Aim of workshop

After the training, the trainee is capable of selecting the right solution methods in case of no convergence in NX Nastran.

Topics

- Theory and methods
- Analysis control (ATS, LDC)
- Analysis parameters (line search, matrix stabilization)
- Modelling influence (contact, element types, boundary conditions)
- Troubleshooting

Who should attend?

This workshop is intended for structural engineers and finite element analysts who want to learn correct solver settings to troubleshoot convergence in NX Nastran (with Femap).

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COURSE

Femap API Programming

Level   Advanced
Duration   2 or 3 days
Language   English or Dutch
Location   Delft, or on-site

Description

API stands for Application Program Interface. The API allows the user to customize Femap to extend the functionality to suit specific needs. Femap includes built-in Visual Basic Integrated Development Environment (IDE) functionality, so you can start programing with the Femap API without any extra programs or optional modules. What can you accomplish with the API?

- Create programs that automate repetitive tasks.
- Enhance the functionality of Femap by creating add-in applications.
- Create programs that provide "canned" analysis routines, which ensure consistency in analysis methods between engineers.
- Use Femap functionality to develop your own programs.
- Automate generation of analysis reports.
- Move data generated in other programs like Excel or Matlab into Femap or vice versa.

Aim of training

In this course the API possibilities of Femap are explained. After the training, the trainee is able to automate tasks trough API programming in Femap.

Topics

- Automation of results processing via Excel
- Introduction to Femap's macro capability
- Introduction to Femap's API via Custom Tools
- Programming Femap's API

Who should attend?

This course is intended for Femap users who want to customize Femap to extend its functionalities. Basic experience in programming is recommended for this course.

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COURSE

SDC Verifier training

Level   Advanced
Duration   1 day
Language   English or Dutch

Description

SDC Verifier is an engineering analysis program fully integrated within Femap and is used to verify structures in accordance with self-defined or required safety standards. The software enables automatic recognition of joints, beam member length, plates with dimensions and welds and, automates report generation.

This course provides the engineer who is new to SDC Verifier with a substantial introduction to the user interface, the structure and the calculation capabilities of SDC Verifier.

Aim of training

Our aim is to offer you a fast, practical and effective way to increase your skill level and productivity when you work with SDC Verifier.

Topics

- The user interface and structure
- Specifying individual loads with load cases and load groups
- Producing adjustable calculation report models
- Complete beam model check
- Recognition of panels and simple plate buckling
- Weld recognition & fatigue checks for plates and beams
- Creating your own checks
- Report generation, creating your own template

Who should attend?

The target audiences for this training course are structural/ FEM engineers, designers, and analysts wishing to strengthen their knowledge of SDC Verifier.

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Location

Depending on the location of the training we provide you with the exact address and directions.

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