COURSE INFORMATION

Introduction to Non-Linear FEA

with MSC Apex and MSC Nastran

Objective:

- Do you want a great foundation to the theory and application of non-linear FEA?
- Are you confused by the terminology and concepts involved in non-linear FEA?
- Is your current FEA approach too simplistic to allow accurate response?
- Do you struggle with non-linear FEA, finding it too difficult to build and control models?
- Would you like to learn awesome software tools that help you achieve successful analysis?

To allow you to maximise your engagement with non-linear FEA, we've developed an online course, which covers both the theoretical background and practical application.

Focussed on the MSC Apex and MSC Nastran Advanced Non-Linear workflow, we'll show you how to build, verify and solve complex non-linear FEA models under a variety of scenarios.

All the taught and tutorial content is based around real-world examples, which, through the progression of eight discrete lessons, will advance your understanding of this complex area of FEA.

We'll also equip you with the knowledge to understand when analyses are going wrong, and what steps are required to ensure successful completion.

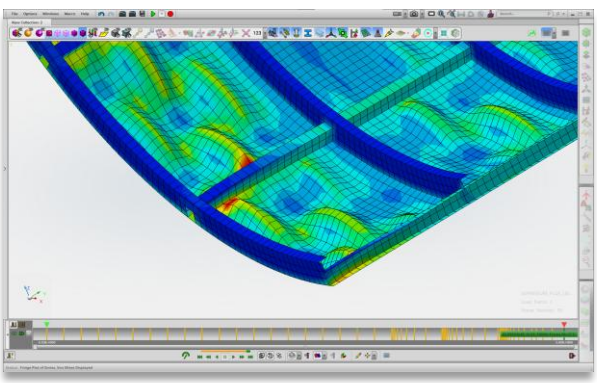
Content:

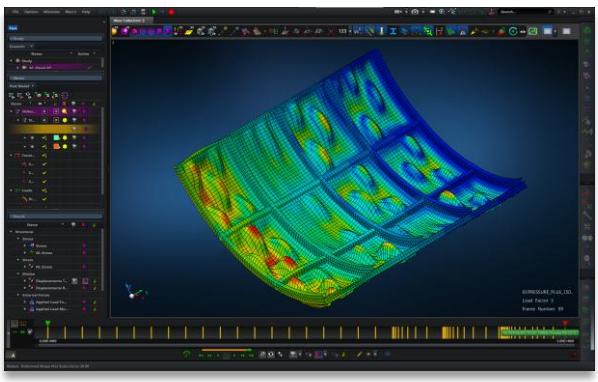
The learning experience is underpinned with a combination of instructor-led explanation and demonstration, in parallel with interactive user tutorials, which develop in involvement through the course.

The course is taught through eight discrete lessons, each ranging from 90 to 120 minutes long.

These include;

- 1.0 Introduction
- 2.0 Efficient Non-Linear FEA Modeling
- 3.0 Non-Linear FEA Solution and Control
- 4.0 Geometric Non-Linearity
- 5.0 Material Non-Linearity
- 6.0 Contact Non-Linearity
- 7.0 Dealing with Non-Linear Solution Failure
- 8.0 Further Topics

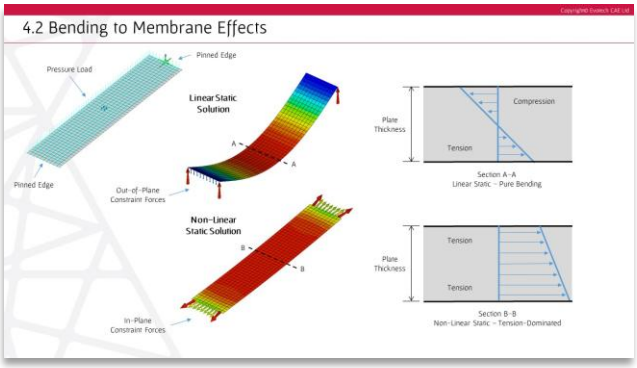


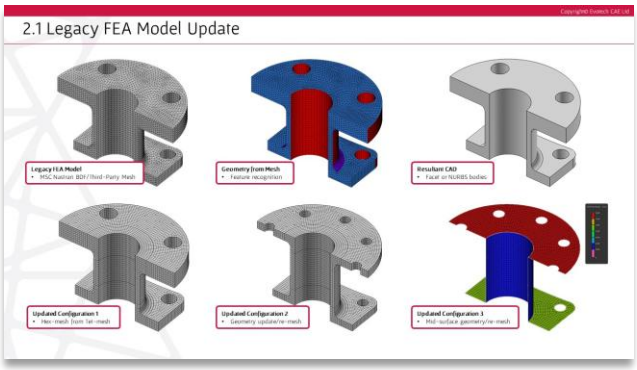


Lesson Structure :

01. Introduction
Covering an MSC Apex/MSC Nastran SOL400 software overview, an introduction to non-linear FEA, a typical workflow, analysis settings and a complete double lap shear joint worked example.

02. Efficient Non-Linear FEA Modeling
Covering model build for non-linear FEA, building confidence in non-linear FEA, automation for non-linear FEA and a complete spigot contact worked example.





03. Non-Linear FEA Solution and Control
Covering a load increment overview, load increment solution, guidelines for non-linear FEA analysis and a complete curved shell worked example.

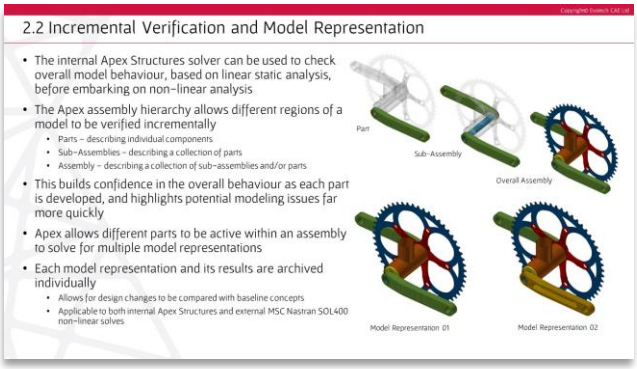
04. Geometric Non-Linearity
Covering a geometric non-linearity overview, large displacement analysis, non-linear buckling analysis and a complete fuselage skin buckling worked example.

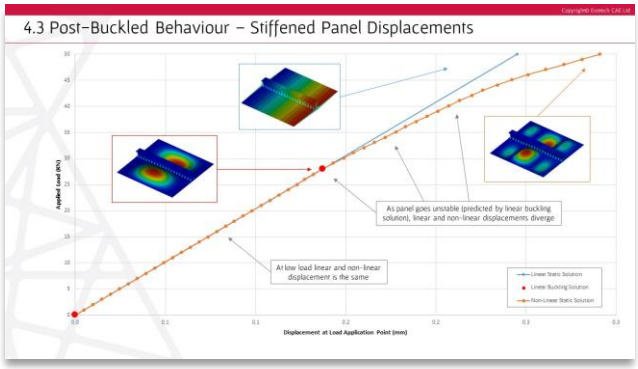
05. Material Non-Linearity
Covering a material non-linearity overview, material plasticity, permanent deformation and a complete hydroforming/spring-back worked example.

06. Contact Non-Linearity
Covering a contact non-linearity overview, general/self-contact, contact set-up and a complete gear contact worked example.

07. Dealing with Non-Linear Solution Failure
Covering non-linear solution failure, non-linear solution strategy, influence of advanced solution controls and non-linear contact assembly verification.

08. Further Topics
Covering initial conditions and multi-step analysis, plus additional MSC Nastran SOL400 functionality, as it becomes available.





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Topic Format:

Each lesson follows a consistent teaching format, which includes;

1., 2. & 3. Key Theory and Concepts
Introduce the key aspects of the lesson, both through a theoretical background and practical application in the Apex environment, all taught through explainer slides and application demonstrations.

4.Worked Tutorial
Your turn to put these concepts into practice.

5.Tutorial Review
We review the lesson and key learning outcomes.

Evotech CAE Background :

This course is developed and delivered by Evotech CAE Ltd, a Cadence business partner. As Director and Lead FEA Engineer of UK-based Evotech CAE Ltd, Dr Steffan Evans has over 25 years' experience of the practical usage of advanced FEA techniques in diverse industrial settings.

This has included the development and delivery of many training courses and programs covering FEA fundamentals, industry application of the technology, alongside direct teaching in how to get the most from your commercial FEA software.

"This course was enjoyable to take. The presentation is excellent, and it was great to tie up theory with well-thought-out practical examples. Highly-recommended for users at all levels wanting to develop their capabilities with non-linear analysis."
Senior Technical Consultant, Cadence

"Non-Linear FEA is a subject area I've struggled with in the past, due to inexperience with the basics, vague documentation, and difficult software. This course gave me a very clear insight into the fundamentals, and a great means of putting this into practice through Apex and Nastran."
Senior FEA Analyst, Aerospace Industry

"We've used several tools to run NL simulation in the past, often with mixed results. Taking this course was a breath of fresh air – great teaching in the 'mechanics' behind NL FEA, coupled with excellent examples and tutorials. I can absolutely see Apex becoming our FEA 'work horse' for NL now!"
Principal Stress Engineer, Oil and Gas Industry

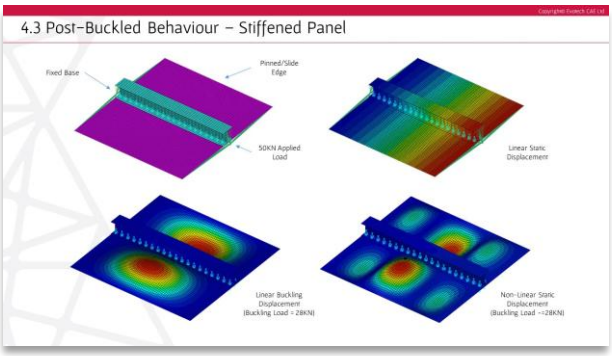
Pre-Requisites:

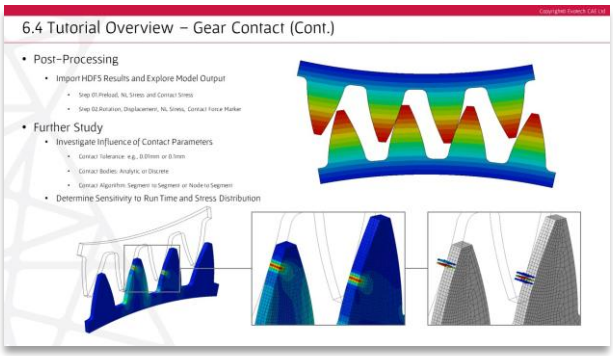
A basic knowledge of strength of materials, CAD modeling is highly recommended.

Some exposure to MSC Apex and MSC Nastran would be beneficial.

Duration: 12-16hrs (online)

Pricing: See evotechcae.com/learn





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