NAFEMS Practical Introduction to Finite Element Analysis
Singapore: 26th to 28th February 2018

An opportunity to ensure that your organization gets maximum benefit using FEA

Register now to secure your early bird registration fee

"Exceeded my initial expectations", "I learnt a lot more than I thought I would and it was genuinely interesting.", "The practical advice given by the lecturer about FEA was very useful", "Confident to return to work and actually know what I'm talking about!"

Motivation.

FEA has become widely used and universally accepted in many industry sectors. FEA is a powerful technique, able to produce solutions to challenging structural analysis problems. The technology and computational efficiency of the method, together with the rapid increases in computer processing power means that today the scope and size of simulations far exceeds the capabilities of even a few years ago.

However, for those engineers embarking on FEA, or companies adopting the technique to improve designs or achieve certification of new products, there is a steep learning curve to overcome.

There are a bewildering array of element types, solution types, meshing methods and pre-post processing options that have to be faced. This is before engineers get down to the engineering physics behind the problem, with the associated classic traps and errors. What is needed is guidance via a thorough but practical assessment of the method and how to use it in the real world.

NAFEMS, the only vendor neutral, not-for-profit organization with the aim of promoting the effective and reliable use of FEA, addresses this requirement by providing this three-day example-driven, practical course.

Attendees are shown the background to the FEA methodology, via simple real examples with a minimum of theory. The strength and weaknesses of various FEA techniques are shown and discussed and practical considerations of loadings, boundary conditions and structural details are shown via examples.

The assessment, validation and interpretation of FEA results are vital for delivering safe, effective products are discussed to provide confidence in the results obtained aiming to provide conservative, reliable and qualified results. The attendees join in the activity of building this process themselves and come away with an embryo Procedural Check List. Report writing is also addressed as a class workshop.

The course offers excellent guidance on how to assess and plan the task of carrying out a FE analysis. A clear understanding of the objectives of each analysis is vital and a road map for achieving this is presented. A review of the trade-off between available resource and analysis methodology is given.

Interaction is encouraged throughout the course. Real world examples are given at every stage, drawn from the Tutors wide
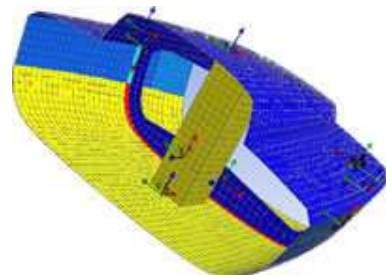
practical experience. Questions and class participation are encouraged, as this is one of the key aspects of making this a unique experience for each attendee. Attendee project examples can often be incorporated into the class if time permits, to benefit all.

The course is completely software independent and attendees are welcome to bring laptops to take notes, but they are not required.

A full set of printed and bound notes will be issued to every attendee.

Who Should Attend?

This course is aimed at practicing engineers who wish to learn more about how to apply finite element techniques to their particular problems in the most effective manner. This course is also very useful for managers (in many cases needing to refresh their knowledge) who review FEA reports and contract suppliers.

The material that is presented is independent of any particular software package, making it ideally suited to current and potential users of all commercial finite element software systems. This course is a must for all engineers aiming to use FEA as a reliable predictive tool for thermal, stiffness and stress analysis.

Companies moving into FEA technology to improve product designs or assess prototype failures or speed the design process will benefit from sending key engineers to this course

The course is open to both members and non-members of NAFEMS.

Course Programme

Day 1

- Introductions
- History and Background
- FEA Process – Linear Static Analysis
- Element Stiffness matrices
- Other Analysis types
- Avoiding Free Motion
- Degrees of Freedom
- Shape Functions
- Element Types
- Beam Structure example
- Controlling DOF
- Quiz 1

Day 2

- Special Elements and Methods
- Element stress inaccuracies
- Convergence Checking
- Stress Singularities
- Local Stress Raisers
- Real World Boundary Conditions
- Minimum Constraint Method
- Real World loading
- Making Life Simpler
- Cylinder Example
- FEA Verification
- FEA Reporting
- Quiz 2

Day 3

- Understanding Analysis Objectives
- Looking at CAD Geometry for FEA
- Why not use 20m Elements?
- Free Body Diagrams
- Types of stresses
- Assessing stresses
- Checking results
- Quiz 3
- Building FEA process sheet
- Conclusions

Registration will be held on Monday morning between 8.30am and 9:00am, with the course starting immediately afterwards. The tutor will aim to commence the course at 9.00am on Tuesday and Wednesday and finish by 5pm each evening. Each day there will be short morning, lunchtime and afternoon breaks.

Course Tutor

Tony Abbey has created and taught a wealth of FEA training material over the past 20 years. Thousands of engineers across the world have benefited from his live and e-learning based classes. He has developed a reputation for providing the student with an experience that is full of insight gained from his extensive experience, but which also challenges and motivates. Tony has been working with FEA for nearly 40 years, both in Industry and for leading FEA software providers in the UK and the US.

His informal and interactive presentation style allows the key concepts to be taught in a manner which involves participants fully in the course material. Tony presents papers at NAFEMS and other conferences on a regular basis and has been involved with NAFEMS since its formation. He has written a series of very popular articles on FEA for Desktop Engineering magazine.

Venue

Grand Copthorne Waterfront Hotel
392 Havelock Road
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Web: Website

Situated just 22 kilometres (12 miles) away from Changi International Airport, the 30-story Grand Copthorne Waterfront Hotel is located along the Singapore waterfront near Boat Quay, Clarke Quay and Robertson Quay. Easily accessible by taxi to various business and entertainment districts, such as Raffles Place, the Marina Bay Financial Centre, Orchard Road, Chinatown, Sentosa and Universal Studios, the hotel presents itself as the ideal place to stay and explore Singapore.

Accommodation

We have negotiated a small number of rooms at the Grand Copthorne Waterfront Hotel. The NAFEMS Training course accommodation rate is SGD 230++ inclusive of one complimentary daily breakfast. The rate is available up to 1 month before the course, subject to availability. To book please quote "NAFEMS Training" and email: rsvns.gcw@millenniumhotels.com.

About NAFEMS

NAFEMS is the International Association for the Engineering Modelling, Analysis and Simulation Community. We focus on the practical application of numerical engineering simulation techniques such as the Finite Element Method for Structural Analysis, Computational Fluid Dynamics, and Multibody Simulation, website: www.nafems.org

About C4D Pte. Ltd.

C4D is the ASEAN Region representative for NAFEMS and works to grow NAFEMS membership within the region. C4D has engaged with many leading organisations to help bring the benefits of NAFEMS membership and Professional Simulation Engineer (PSE) certification.
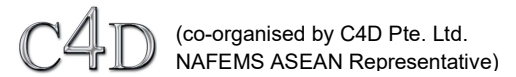
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