



MATT RUDAS *MIEAust NER RPEQ CPEng*

- Chartered mechanical engineer with over 25 years of experience
- Owner principal at Mechsafe Engineering
- Specialist FEA and BEA analyst of stress, fatigue and fatigue crack growth in structures and heavy machinery

Live streamed via



WORKSHOP SUMMARY

This workshop is designed to give an introduction to engineering analysis using the Finite Element Method (FEM). Finite Element Analysis (FEA) is now widely used in industry, with most mechanical and structural engineers relying on commercially available FEA software on a daily basis to carry out engineering calculations. From structural analysis to harmonic response analysis, stress analysis, fatigue crack propagation studies, impact analysis and post-buckling analysis, FEA is a powerful tool, saving time and providing accurate solutions to engineering problems.

However, although users of FEA have often attended courses on the use of a particular software package, not many are familiar with the underlying theory or many software/code independent practical aspects of working with FEA such as model and element type selection, using analysis checklists, working to codes and standards, FEA report writing and, most importantly, error checking and verification of results. This workshop covers all of these topics and thus provides an in-depth introduction to working with FEA.

A practical demonstration session is also included as part of the workshop to present tips and tricks, CAD model simplification and defeaturing techniques, meshing techniques, error sources and how to minimize errors, and model verification strategies.

PROGRAMME (8.30 - 9.00 Zoom invite link will be emailed)

9.00 - 11.00 Session 1

- INTRODUCTION TO FINITE ELEMENT METHOD

- History of the Finite Element Method
- What is finite element analysis (FEA) – and what is it not?
- Why do we carry out FEA?
- Commercially available packages
- Approximation of physical systems
- Applications of FEA
- General procedure for FEA – preprocessing & postprocessing

11.00 - 11.15 Morning Break

11.15 - 1.00 Session 2

- FINITE ELEMENT STIFFNESS MATRIX

- Characteristics of finite elements
- Linear spring as a finite element – one dimensional elements
- Local and global element coordinate systems
- Element stiffness matrix
- System assembly in global coordinates
- Elastic bar elements
- Element shape functions
- Tutorial questions

1.00 - 1.30 Lunch Break

1.30 - 3.00 Session 3

- USING FEA IN YOUR ENGINEERING WORK

- FEA checklists
- Using standards with FEA
- Modelling techniques
- Working CAD geometry
- Validation of results
- Error checking
- Preparation of FEA reports
- Tutorial questions



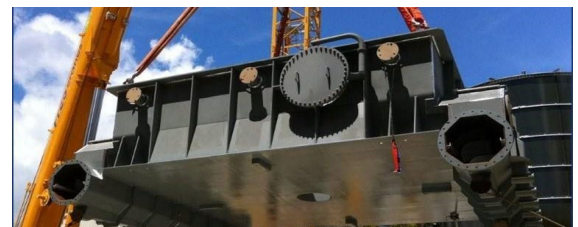
3.00 - 3.15 Afternoon Break

3.15 - 5.00 Session 4

- PRACTICAL DEMONSTRATIONS USING FEA SOFTWARE

- Preprocessing – solution – postprocessing
- CAD defeaturing
- Element selection
- Mesh quality checks
- Solution quality checks
- Interrogation of model
- Linear versus non-linear solver
- Buckling, plasticity and impact analysis

Certificate of Attendance will be emailed



CALCULATORS REQUIRED

COURSE COST

- 1 day course – **\$785 pp**

DATES, VENUES & REGISTRATION

- Registration form (back of catalogue)
- Visit our website www.etia.net.au

FURTHER INFORMATION

- Office (02) 9899 7447
- Mobile 0413 998 031
- Email registrations@etia.net.au