

ESRD LIVE WEB-BASED TRAINING OPTIONS – 2023

STRESSCHECK BASIC TRAINING PLUS LINEAR ELASTICITY

(UP TO 2 STUDENTS PER TRAINING SESSION)

The Web-based Basic Training plus Linear Elasticity class is a 5-day course designed to familiarize the student with the StressCheck graphical user interface and provide an introduction to the p-version finite element method (p-FEM). The student will obtain a basic knowledge of 2D and 3D model construction techniques, learn how to execute a linear solutions and perform a wide range of post-processing operations. Students will receive lectures and hands-on tutorials covering the fundamental concepts of the p-FEM that include meshing, applying boundary conditions and quality assurance procedures. **Basic training is a prerequisite to any advanced training workshops.**

NOTE: Training Manuals will be provided as PDF's. It is recommended that the manuals are printed for each student.

- Key Topics:
 - P-version FEA, convergence, errors of idealization and discretization
 - Basics of StressCheck, GUI layout, solver, pre- and post-processing
 - Parametric modeling guidelines, meshing and boundary conditions
 - Importing and modifying CAD files
 - Basics of multi-body contact setup, analysis and post-processing
 - Basics of global-local analysis and TLAP methods
- Daily Schedule:
 - Day 1 - Monday
 - 2 hours of Web-based Lectures/Discussions
 - ~1 hour of student/instructor working Exercises
 - ~1-2 hours of student working Exercises
 - Day 2 - Tuesday
 - 2 hours of Web-based Lectures/Discussions
 - ~1 hour of student/instructor working Exercises
 - ~1-2 hours of student working Exercises
 - Day 3 – Wednesday
 - 1 hour of Web-based Lectures
 - ~1 hour of student/instructor working Exercises
 - ~2-3 hours of student working Exercises
 - Day 4 – Thursday
 - 1 hour of Web-based Lectures
 - ~1 hour of student/instructor working Exercises
 - ~2-3 hours of student working Exercises
 - Day 5 – Friday
 - 1 hour of Web-based to review the week.

STRESSCHECK ADVANCED TRAINING IN FRACTURE MECHANICS (UP TO 2 STUDENTS PER TRAINING SESSION)

The 3-day Web-based Advanced Fracture Mechanics course has a lecture presenting an overview on capabilities and functionality in Fracture Mechanics. In this class the student will develop a comprehensive understanding of the Fracture Mechanics pre- and post-processing capabilities for performing detail analyses for cracked structures.

NOTE: Training Manuals will be provided as PDF's. It is recommended that the manuals are printed for each student.

- *Key Topics:*
 - *Linear elastic fracture mechanics (LEFM), contour integral method, J-integral*
 - *Modeling and meshing cracks in StressCheck, best practices in 2D/3D*
 - *Boundary layer meshing*
 - *Extracting stress intensity factors (SIFs)*
 - *Advanced fracture mechanics analysis*
- *Daily Schedule:*
 - *Day 1 - Monday*
 - *1 hour of Web-based Lectures*
 - *~1 hour of student/instructor working Exercises*
 - *~1-2 hours of student working Exercises*
 - *Day 2 - Tuesday*
 - *1 hour of Web-based Lectures*
 - *~1 hour of student/instructor working Exercises*
 - *~1-2 hours of student working Exercises*
 - *Day 3 – Wednesday*
 - *1 hour of Web-based Lectures*
 - *~1 hour of student/instructor working Exercises*
 - *~2-3 hours of student working Exercises*

STRESSCHECK ADVANCED TRAINING IN NONLINEAR ANALYSIS

(UP TO 2 STUDENTS PER TRAINING SESSION)

The 3-day Web-based Advanced Nonlinear Analysis course has a lecture presenting an overview on capabilities and functionality in Nonlinear Analysis. In this class the student will develop a comprehensive understanding of the Nonlinear Analysis pre-, solution and post-processing capabilities for performing detail analyses for structures undergoing plasticity and/or large deformation.

NOTE: *Training Manuals will be provided as PDF's. It is recommended that the manuals are printed for each student.*

- *Key Topics:*
 - *Deformation and incremental plasticity theories, geometric nonlinear theory*
 - *Elastic-plastic material definitions and assignments*
 - *Material and general nonlinear analyses*
 - *Fastener element, link element and fastened structural connections in 2D*
 - *Advanced nonlinear analysis*
- *Daily Schedule:*
 - *Day 1 - Monday*
 - *1 hour of Web-based Lectures*
 - *~1 hour of student/instructor working Exercises*
 - *~1-2 hours of student working Exercises*
 - *Day 2 - Tuesday*
 - *1 hour of Web-based Lectures*
 - *~1 hour of student/instructor working Exercises*
 - *~1-2 hours of student working Exercises*
 - *Day 3 – Wednesday*
 - *1 hour of Web-based Lectures*
 - *~1 hour of student/instructor working Exercises*
 - *~2-3 hours of student working Exercises*

STRESSCHECK ADVANCED TRAINING IN COMPOSITES ANALYSIS (UP TO 2 STUDENTS PER TRAINING SESSION)

The 3-day Web-based Advanced Composites course has a lecture presenting an overview on capabilities and functionality in StressCheck Composites. In this class the student will develop a comprehensive understanding of the StressCheck Composites GUI features and pre- and post-processing capabilities for performing detailed analyses of composite structures.

NOTE: *Training Manuals will be provided as PDF's. It is recommended that the manuals are printed for each student.*

- *Key Topics:*
 - *Meshing of laminated composite structures*
 - *Laminated composite material definition and assignment*
 - *Automatic lamination builder, ply by ply modeling*
 - *Post-processing of laminated composites*
 - *Advanced laminated composites analysis*
- *Daily Schedule:*
 - *Day 1 - Monday*
 - *1 hour of Web-based Lectures*
 - *~1 hour of student/instructor working Exercises*
 - *~1-2 hours of student working Exercises*
 - *Day 2 - Tuesday*
 - *1 hour of Web-based Lectures*
 - *~1 hour of student/instructor working Exercises*
 - *~1-2 hours of student working Exercises*
 - *Day 3 – Wednesday*
 - *1 hour of Web-based Lectures*
 - *~1 hour of student/instructor working Exercises*
 - *~2-3 hours of student working Exercises*

STRESSCHECK ADVANCED TRAINING IN RESIDUAL STRESSES (UP TO 2 STUDENTS PER TRAINING SESSION)

The 2-day Web-based Advanced Residual Stress course has a lecture presenting an overview on capabilities and functionality in StressCheck bulk residual stress (BRS) and subsurface residual stress (SRS) modules. In this class the student will develop a comprehensive understanding of StressCheck's GUI features and analysis capabilities for performing analysis with these modules.

NOTE: *Training Manuals will be provided as PDF's. It is recommended that the manuals are printed for each student.*

- *Key Topics:*
 - *Specification of subsurface stress and eigenstrain profiles.*
 - *Prediction of deformation due to surface treatments.*
 - *Importation and assignment of bulk residual stress.*
 - *Prediction of deformation and residual stress redistribution after machining.*
- *Daily Schedule:*
 - *Day 1 - Monday*
 - *1 hour of Web-based Lectures*
 - *~1 hour of student/instructor working Exercises*
 - *~1-2 hours of student working Exercises*
 - *Day 2 - Tuesday*
 - *1 hour of Web-based Lectures*
 - *~1 hour of student/instructor working Exercises*
 - *~1-2 hours of student working Exercises*