

# ESRD LIVE WEB-BASED TRAINING OPTIONS - 2017

## STRESSCHECK BASIC TRAINING PLUS LINEAR ELASTICITY

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 and post-processing
  - CAE Handbook
- Daily Schedule:
  - Day 1 – Monday (TOTAL: ~5 hours)
    - 2 hours of Web-based Lectures/Discussions
    - ~1 hour of student/instructor working Exercises
    - ~1-2 hours of student working Exercises
  - Day 2 – Tuesday (TOTAL: ~5 hours)
    - 2 hours of Web-based Lectures/Discussions
    - ~1 hour of student/instructor working Exercises
    - ~1-2 hours of student working Exercises
  - Day 3 – Wednesday (TOTAL: ~4 hours)
    - 1 hour of Web-based Lectures
    - ~1 hour of student/instructor working Exercises
    - ~2-3 hours of student working Exercises
  - Day 4 – Thursday (TOTAL: ~4 hours)
    - 1 hour of Web-based Lectures
    - ~1 hour of student/instructor working Exercises
    - ~2-3 hours of student working Exercises
  - Day 5 – Friday (TOTAL: 1 hour)
    - 1 hour of Web-based to review the week.

## STRESSCHECK ADVANCED TRAINING IN COMPOSITES ANALYSIS

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 (TOTAL: ~3 hours)*
    - *1 hour of Web-based Lectures*
    - *~1 hour of student/instructor working Exercises*
    - *~1-2 hours of student working Exercises*
  - *Day 2 – Tuesday (TOTAL: ~3 hours)*
    - *1 hour of Web-based Lectures*
    - *~1 hour of student/instructor working Exercises*
    - *~1-2 hours of student working Exercises*
  - *Day 3 – Wednesday (TOTAL: ~4 hours)*
    - *1 hour of Web-based Lectures*
    - *~1 hour of student/instructor working Exercises*
    - *~2-3 hours of student working Exercises*

## STRESSCHECK ADVANCED TRAINING IN FRACTURE MECHANICS

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 (TOTAL: ~3 hours)
    - 1 hour of Web-based Lectures
    - ~1 hour of student/instructor working Exercises
    - ~1-2 hours of student working Exercises
  - Day 2 – Tuesday (TOTAL: ~3 hours)
    - 1 hour of Web-based Lectures
    - ~1 hour of student/instructor working Exercises
    - ~1-2 hours of student working Exercises
  - Day 3 – Wednesday (TOTAL: ~4 hours)
    - 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

*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 (TOTAL: ~3 hours)*
    - *1 hour of Web-based Lectures*
    - *~1 hour of student/instructor working Exercises*
    - *~1-2 hours of student working Exercises*
  - *Day 2 – Tuesday (TOTAL: ~3 hours)*
    - *1 hour of Web-based Lectures*
    - *~1 hour of student/instructor working Exercises*
    - *~1-2 hours of student working Exercises*
  - *Day 3 – Wednesday (TOTAL: ~4 hours)*
    - *1 hour of Web-based Lectures*
    - *~1 hour of student/instructor working Exercises*
    - *~2-3 hours of student working Exercises*