

StressCheck 10.1 Training Outline

Advanced Training in StressCheck Scripting (COM API)

Objectives:

- 1) Review Object Oriented Programming (OOP) concepts:
 - a. Terminology, Definitions and Standards (Class Hierarchy).
- 2) Learn how to access objects, properties, and methods in StressCheck's COM API:
 - a. Application, Document, and Model classes.
 - b. Assigning object references and methods.
- 3) Tips and Tricks for getting started with StressCheck COM API scripting:
 - a. Fundamental commands for opening, solving and post-processing models.
- 4) "On-the-fly" model construction and analysis via the StressCheck COM API:
 - a. Identify 1:1 correlations between COM API and GUI.
- 5) Modular VBA and use of functions and subroutines with StressCheck's COM API:
 - a. Efficient and standardized scripts for repetitive tasks and analysis.

Session I (4 hrs) Intro to the StressCheck COM API, COM API Scripting Fundamentals, Interactive vs. COM API, Modular VBA

- ❑ **Lecture:** Intro to the StressCheck COM API.
- ❑ **Exercise:** Intro to COM API Scripting with StressCheck v10.1 – Exercise 1. Fundamental OOP concepts. Basic scripting to open a new StressCheck session, open a Handbook file, change a parameter, solve and extract solution information.
- ❑ **Exercise:** Interactive vs. COM API – Part 1. Compare the pre-processing of a countersink plate between the StressCheck GUI and the StressCheck COM API.
- ❑ **Discussion/Exercise:** Designing and testing a StressCheck VBA "Wrapper" Module. Reusable module for common and repetitive scripting tasks.

Session II (4 hrs) Modular Code Design, Building Application Templates, Advanced StressCheck COM API Methods

- ❑ **Exercise:** Intro to COM API Scripting with StressCheck v10.1 – Exercise 2. Using a pre-existing Excel GUI and incorporating modular scripting components to solve a bulkhead attach lug beta factor analysis.
- ❑ **Exercise:** Interactive vs. COM API – Part 2. Complete the analysis of the countersink plate of Part 1, and compare the StressCheck GUI and the StressCheck COM API.
- ❑ **Discussion/Demo:** Advanced Excel VBA Scripting for StressCheck Applications.
 - 1) 3D Crack Driver: An extension of Exercise 2 above with a 3D Handbook model.
 - 2) Laminated Test Specimen: Explore different ply layups and orientations.
 - 3) Cracked Plate Driver: 3D part thru cracks with arbitrary orientations.
- ❑ **Discussion:** StressCheck 3.1 Object Library.