



*Hands On, Measurable
Training Programs*

Introduction to Tosca Structure

Course Code	SIM-en-TOSCST-F-V30R2021
Brand & Release	SIMULIA 2021
Duration	2 days
Level	Fundamentals
Prerequisites	None

Objectives:

This course is a comprehensive introduction to the structural optimization capabilities of Tosca Structure. Tosca Structure provides topology, shape, sizing, and bead optimization for mechanical structures based on simulation results from industry standard FEA packages. Optimization can significantly reduce the required number of expensive improvement loops or prototypes.

Class Structure:

Upon completion of this course, you will be able to:

- Create optimal design concepts or improve existing designs of mechanical structures
- Solve fundamental topology, shape, sizing, and bead optimization problems
- Optimize parts regarding weight, stiffness, and durability
- Visualize, evaluate, and transfer optimization results

Class Lessons:

Lesson 1: Introduction to Optimization
Lesson 2: Workflow with Tosca Structure
Lesson 3: Typology Optimization Basics
Lesson 4: Geometric Restrictions for Topology Optimization
Lesson 5: Postprocessing and Validation of Optimization Results
Lesson 6: Sensitivity-based Topology Optimization
Lesson 7: Shape Optimization Basics
Lesson 8: Geometric Restrictions for Shape Optimization
Lesson 9: Sensitivity-based Shape Optimization
Lesson 10: Sizing Optimization
Lesson 11: Bead Optimization
Lesson 12: Configuration and Solver Interface

Workshop 1: Stiffness Optimization of a Brake Booster
Workshop 2: Stiffness Optimization of a Control Arm
Workshop 3: Topology Optimization of a Crane Hook
Workshop 4: Shape Optimization of a Plate with a Hole
Workshop 5: Shape Optimization of a Connecting Rod
Workshop 6: Sensitivity-based Optimization of a Crane Hook
Workshop 7: Sizing Optimization of a Holder
Workshop 8: Bead Optimization of an Oil Pan
Workshop 9: Bead Optimization of a Hood (optional)