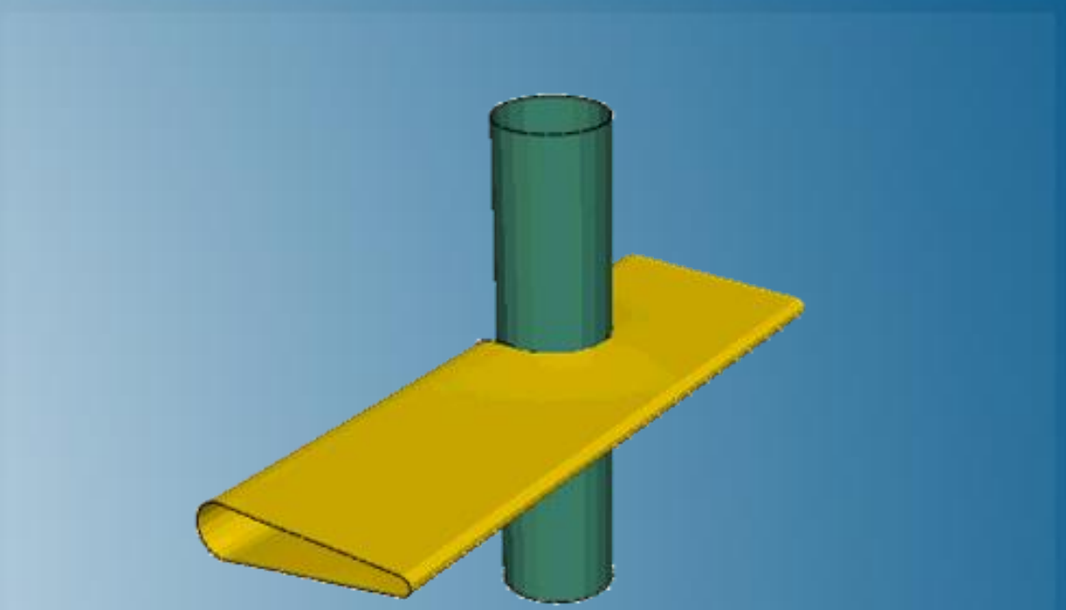
DASSAULT SYSTEMES

CZone for Abaqus

Abaqus 2018



3DEXPERIENCE®

About this Course

Course objectives

Upon completion of this course you will be able to:

- Include crushable composite structures in your impact simulations
- Understand guidelines for defining crushable composite materials based on composite coupon and component testing
- Incorporate crushable composite structures into your models and how to postprocess CZA analysis results

Targeted audience

Engineers with experience using Abaqus/Explicit

Prerequisites

The *Abaqus/Explicit: Advanced Topics* and *Analysis of Composite Materials with Abaqus* seminars are recommended as prerequisites

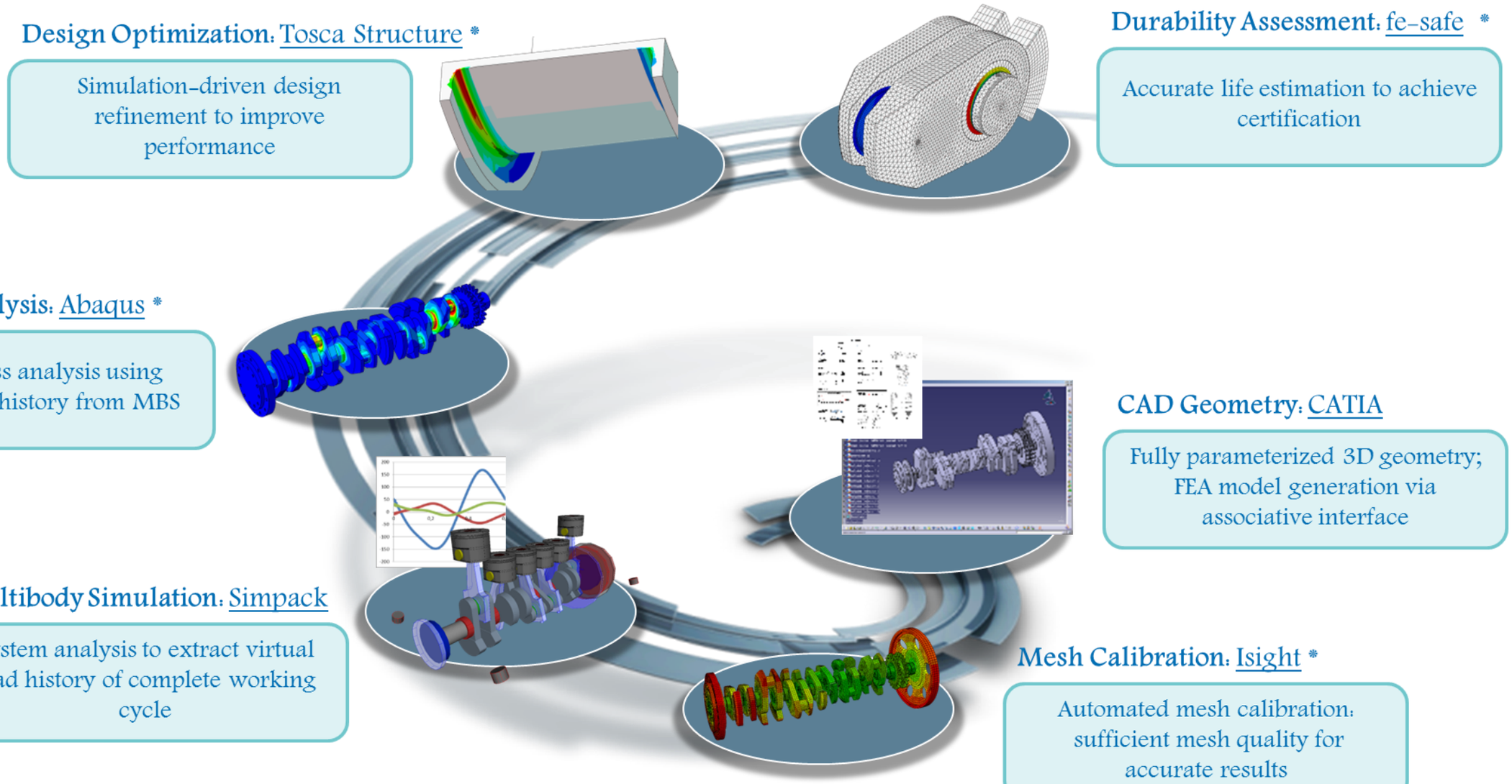
4 hours

Day 1

- Lecture 1 — Modeling Crushable Composite Materials
- Lecture 2 — Creating a CZA Model
  - Workshop 1 — Race car wing impact: Model Setup
- Lecture 3 — Postprocessing
  - Workshop 2 — Race car wing impact: Postprocessing

SIMULIA

- SIMULIA is the Dassault Systèmes brand for Realistic Simulation solutions
- Portfolio of established, best-in-class products
  - Abaqus, Isight, Tosca, fe-safe, Simpack



Design Optimization: Tosca Structure *

Simulation-driven design refinement to improve performance

Durability Assessment: fe-safe *

Accurate life estimation to achieve certification

FEA Stress Analysis: Abaqus *

Detailed stress analysis using extracted load history from MBS

CAD Geometry: CATIA

Fully parameterized 3D geometry; FEA model generation via associative interface

Multibody Simulation: Simpack

System analysis to extract virtual load history of complete working cycle

Mesh Calibration: Isight *

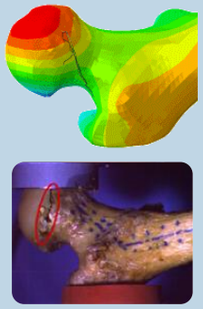
Automated mesh calibration: sufficient mesh quality for accurate results

* Included in extended licensing pool

SIMULIA's Power of the Portfolio

Abaqus

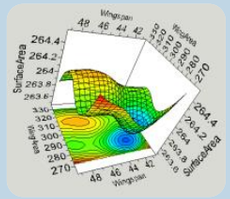
- Routine and Advanced Simulation
- Linear and Nonlinear, Static and Dynamic
- Thermal, Electrical, Acoustics
- Extended Physics through Co-simulation
- Model Preparation and Visualization



Realistic Human Simulation
High Speed Crash & Impact
Noise & Vibration

Isight

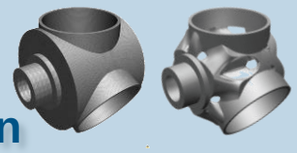
- Process Integration
- Design Optimization
- Parametric Optimization
- Six Sigma and Design of Experiments



Material Calibration
Workflow Automation
Design Exploration

Tosca

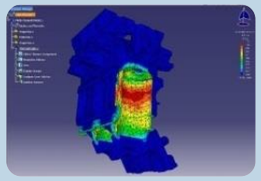
- Non-Parametric Optimization
- Structural and Fluid Flow Optimization
- Topology, Sizing, Shape, Bead Optimization



Conceptual/Detailed Design
Weight, Stiffness, Stress
Pressure Loss Reduction

fe-safe

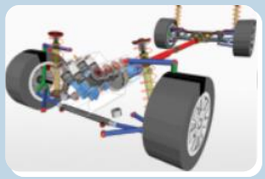
- Durability Simulation
- Low Cycle and High Cycle Fatigue
- Weld, High Temperature, Non-metallics



Safety Factors
Creep-Fatigue Interaction
Weld Fatigue

Simpack

- 3D Multibody Dynamics Simulation
- Mechanical or Mechatronic Systems
- Detailed Transient Simulation (Offline and Realtime)



Complete System Analyses
(Quasi-)Static, Dynamics, NVH
Flex Bodies, Advanced Contact

Join the Community!

How can you maximize the robust technology of the SIMULIA Portfolio ?

Connect with peers to share knowledge and get technical insights

Go to www.3ds.com/slc
to log in or join!

SIMULIA

Let the SIMULIA Learning Community be *Your* Portal to 21st Century Innovation

Discover new ways to explore how to leverage realistic simulation to drive product innovation. Join the thousands of Abaqus and Isight users who are already gaining valuable knowledge from the SIMULIA Learning Community.

For more information and registration, visit **3ds.com/simulia-learning**.
Connect. Share. Spark Innovation.

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SIMULIA Training

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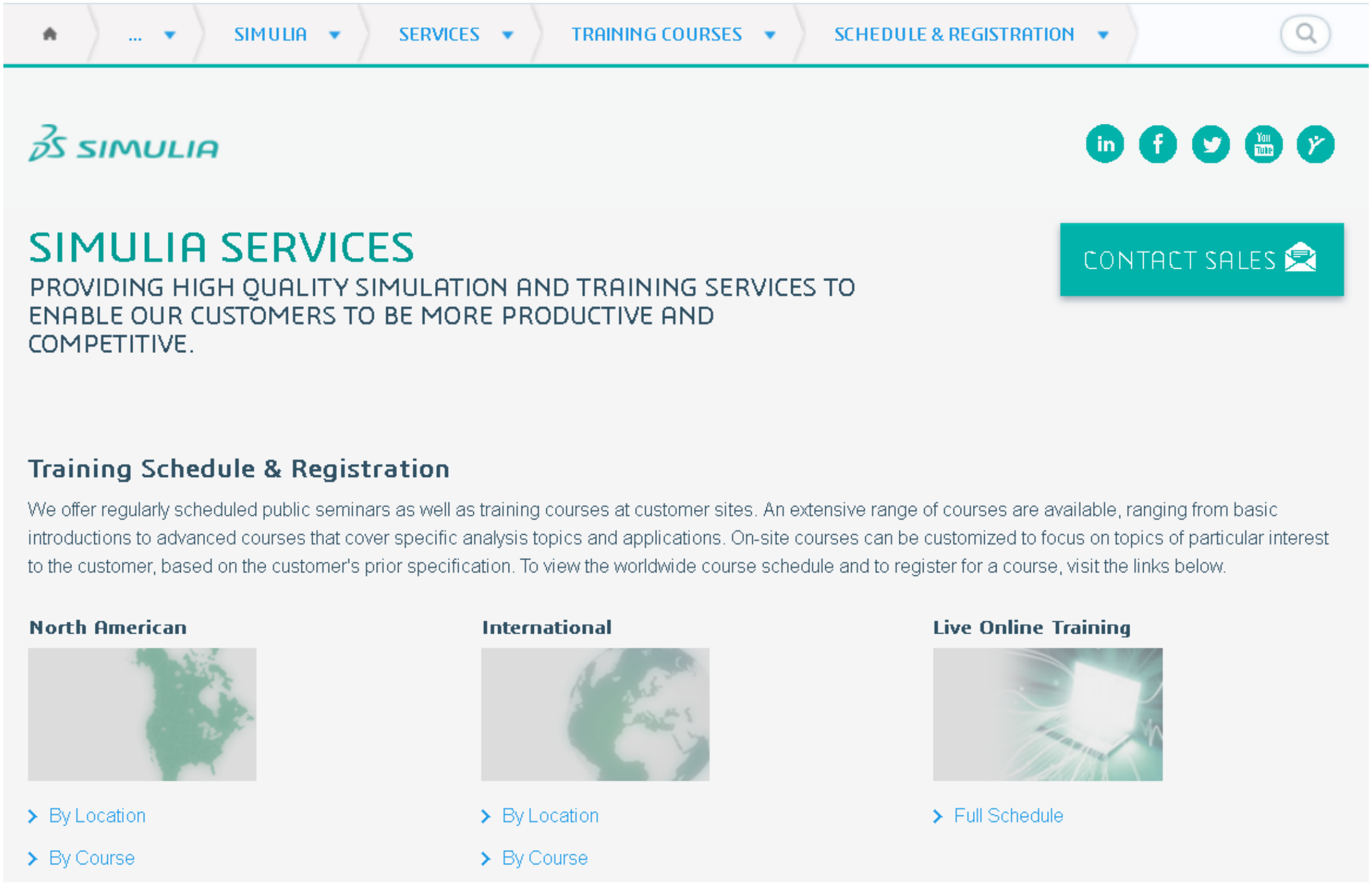

Legal Notices

Revision Status

Lecture 1	11/17	Updated for Abaqus 2018
Lecture 2	11/17	Updated for Abaqus 2018
Lecture 3	11/17	Updated for Abaqus 2018
Workshop 1	11/17	Updated for Abaqus 2018
Workshop 2	11/17	Updated for Abaqus 2018

Lesson 1: Modeling Crushable Composite Materials

Lesson content:

- What is CZone?
- Why do we need CZone?
- CZone applications and examples
- CZone crush stress
- Other CZA material properties
- More on Damping and Viscoelasticity
- Summary

1.5 hours

Lesson 2: Creating a CZA Model

Lesson content:

- Modeling crushable structures
- Composite layups
- CZone contact
- Output
- CZA plug-in for Abaqus/CAE
- CZA modeling checklist
- Workshop Preliminaries
- Workshop 1: Race car wing impact: Model Setup

2 hours

Lesson 3: CZA Postprocessing

Lesson content:

- Introduction
- Identifying failure
- Viewing a composite layup
- *X*-*Y* plots
- Workshop 2: Race car wing impact: Postprocessing

1 hour