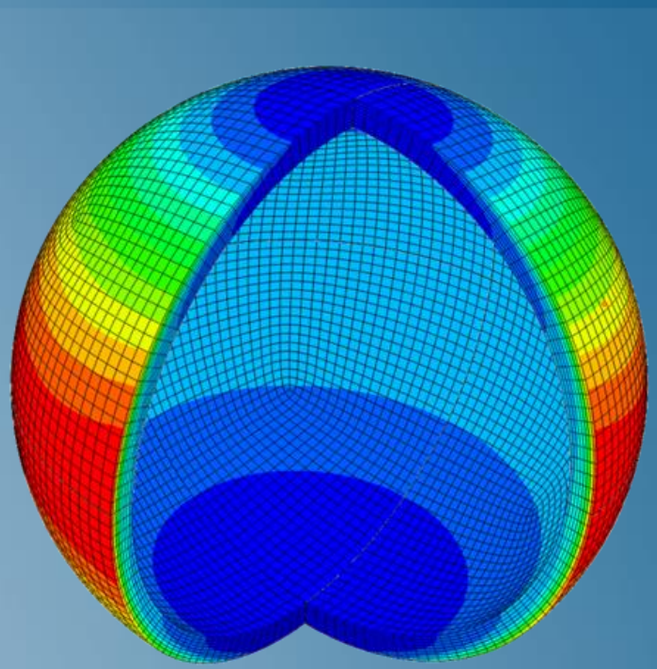
Electromagnetic Analysis with Abaqus

Abaqus 2022



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About this Course

Course objectives

Upon completion of this course you will be able to:

- Set up and create electromagnetic models with Abaqus
- Perform low frequency eddy current analyses with Abaqus
- Perform transient eddy current analyses with Abaqus
- Perform magnetostatic analyses with Abaqus

Targeted audience

Simulation Analysts

Prerequisites

This course is recommended for engineers with experience using Abaqus

1 day

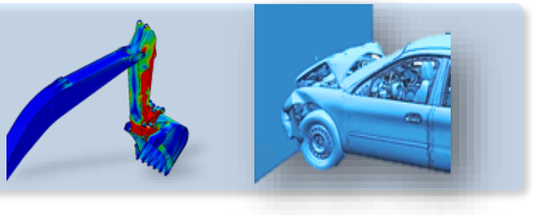
Day 1

- Lesson 1 — Introduction to Computational Electromagnetics
- Lesson 2 — Geometry, Material Properties, Elements and Meshing
  - Workshop 1 — Heating of a Rod: Problem setup
  - Workshop 2 — Sphere in a Magnetic Field: Problem setup
- Lesson 3 — Loads and Boundary Conditions
- Lesson 4 — Output and Transfer of Results
  - Workshop 1 (cont'd) — Heating of a Rod: Thermal Response
  - Workshop 2 (cont'd) — Sphere in a Magnetic Field: Electromagnetic Response
  - Workshop 3 — Magnetostatic Analysis of a Solenoid Valve
  - Workshop 4 — Magnetic Pulse Forming of a Metallic Tube

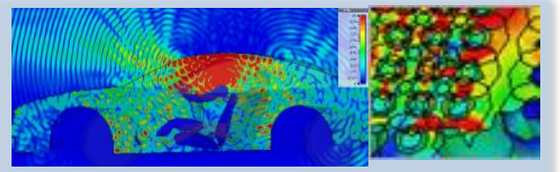
SIMULIA

- SIMULIA is the Dassault Systèmes brand for realistic simulation solutions.
- Advanced simulation portfolio covering simulation disciplines such as structural mechanics, computational fluid dynamics and electromagnetic field simulation, for a true multiphysics simulation approach.

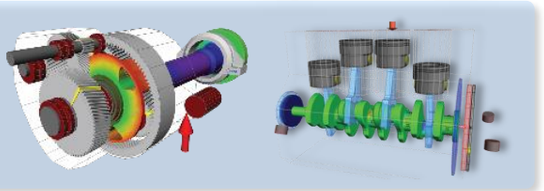
Structures



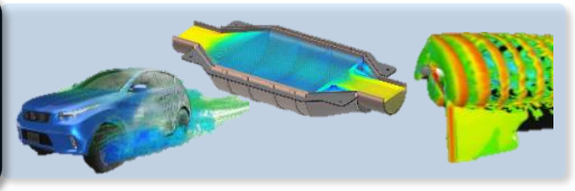
Electromagnetics



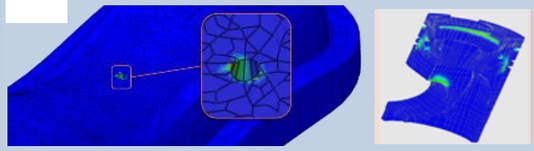
Multibody



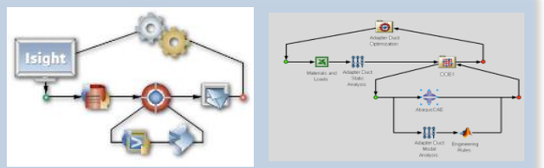
Fluids



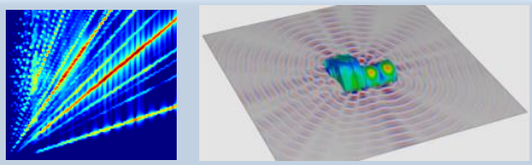
Durability



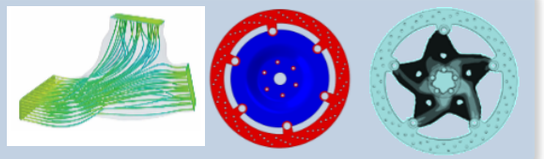
Automation



Vibro-acoustics



Optimization



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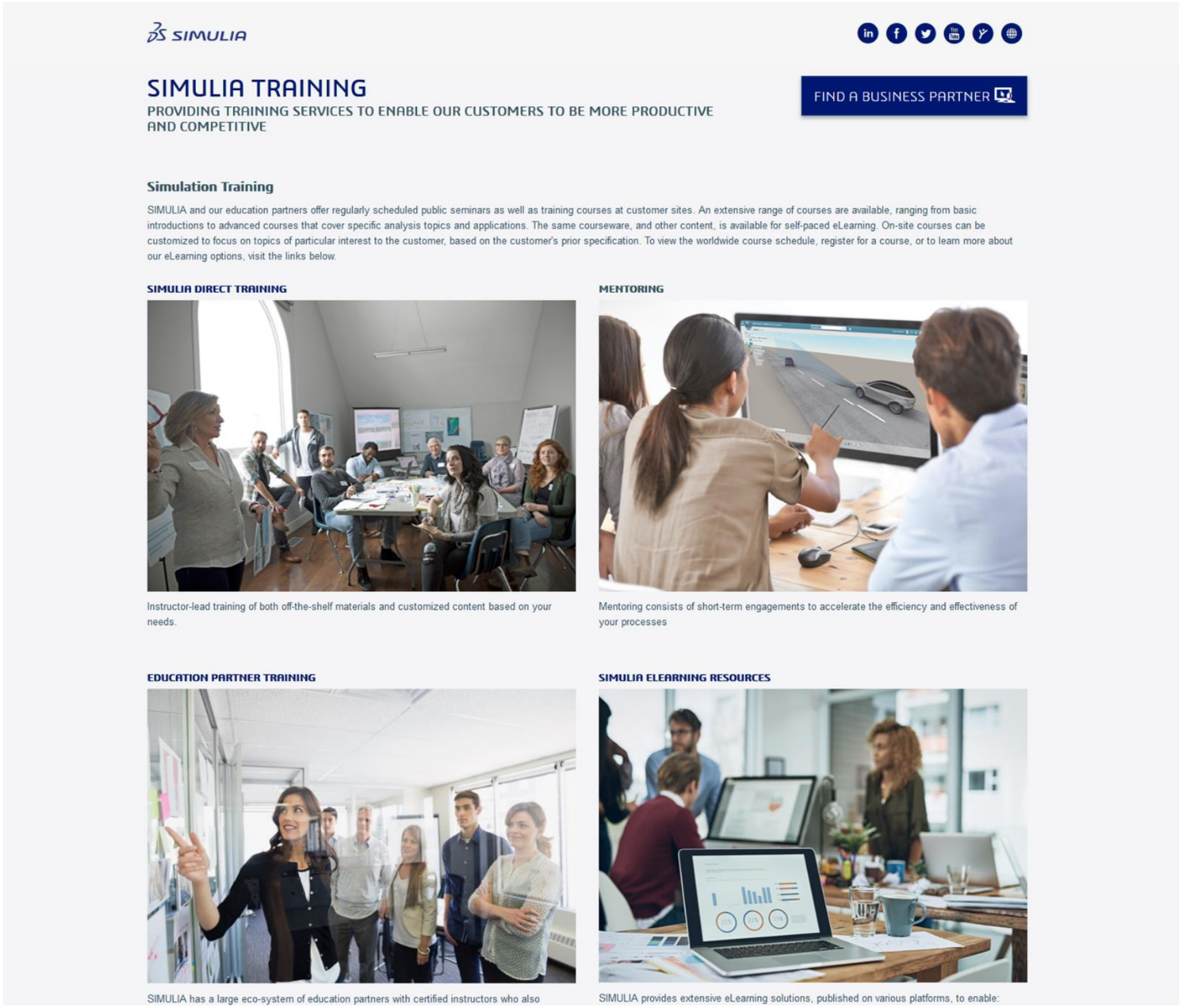

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Revision Status

Lesson 1	11/21	Updated for Abaqus 2022
Lesson 2	11/21	Updated for Abaqus 2022
Lesson 3	11/21	Updated for Abaqus 2022
Lesson 4	11/21	Updated for Abaqus 2022
Workshop 1	11/21	Updated for Abaqus 2022
Workshop 2	11/21	Updated for Abaqus 2022
Workshop 3	11/21	Updated for Abaqus 2022
Workshop 4	11/21	Updated for Abaqus 2022

Lesson 1: Introduction to Computational Electromagnetics

Lesson content:

- Motivation
- Basics of Electromagnetism
- Computational Electromagnetics in Abaqus
- Workflow of an Electromagnetic Analysis
- Examples

45 minutes

Lesson 2: Geometry, Material Properties, Elements and Meshing

Lesson content:

- Geometry Creation
- Material Properties
- Element Technology
- Meshing
- Workshop Preliminaries
- Workshop 1: Heating of a Rod: Problem setup
- Workshop 2: Sphere in a Magnetic Field: Problem setup

2 hours

Lesson 3: Loads and Boundary Conditions

Lesson content:

- Introduction
- Loads
- Boundary Conditions
- Symmetry
- Motion

1 hour

Lesson 4: Output and Transfer of Results

Lesson content:

- Analysis Procedures
- Co-simulation
- Sequential Mapping
- Output
- Workshop 1 (cont'd): Heating of a Rod: Thermal Response
- Workshop 2 (cont'd): Sphere in a Magnetic Field: Electromagnetic Response
- Workshop 3: Magnetostatic Analysis of a Solenoid Valve
- Workshop 4: Magnetic Pulse Forming of a Metallic Tube

3 hours