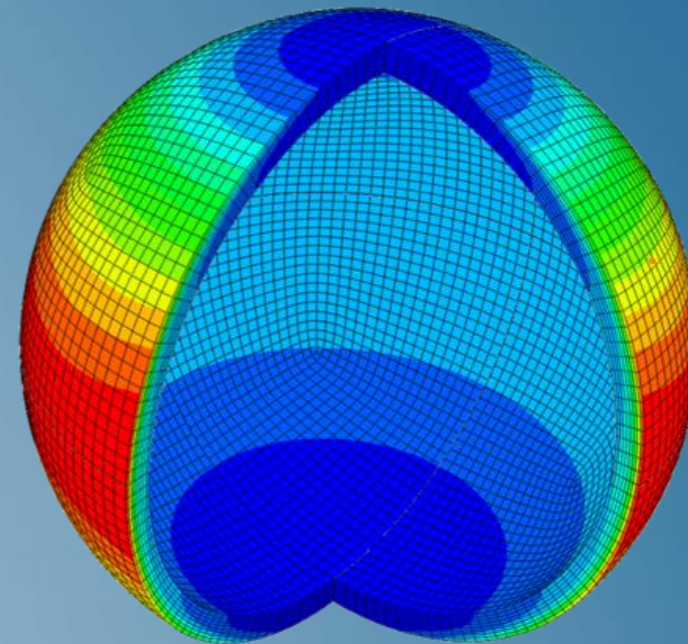


Electromagnetic Analysis with Abaqus

Abaqus 2022



3DEXPERIENCE[®]



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

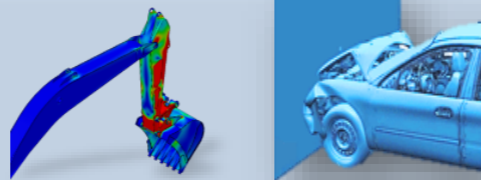
 - Workshop 3 Magnetostatic Analysis of a Solenoid Valve

 - Workshop 4 Magnetic Pulse Forming of a Metallic Tube

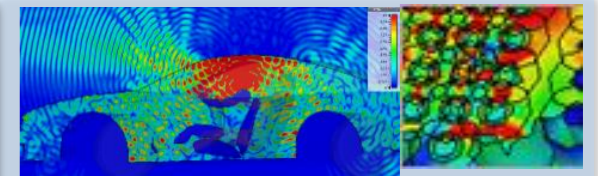
SIMULIA

- ▶ 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.

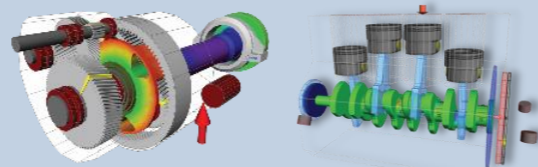
Structures



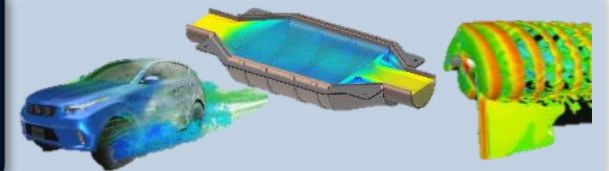
Electromagnetics



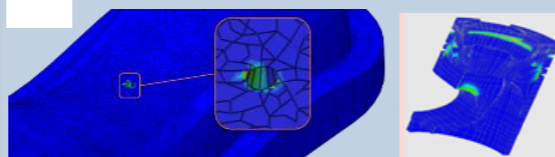
Multibody



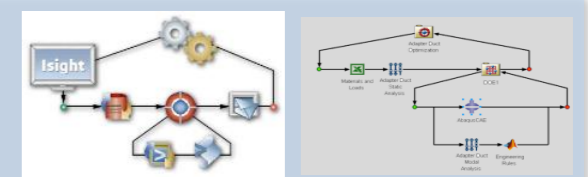
Fluids



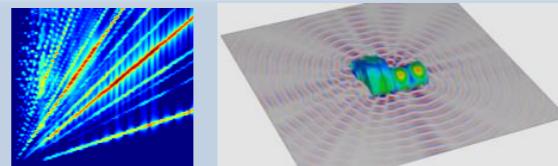
Durability



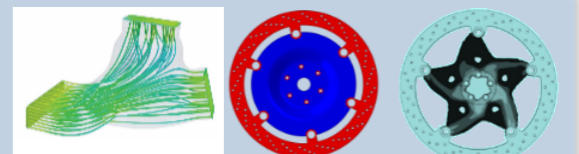
Automation



Vibro-acoustics



Optimization



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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