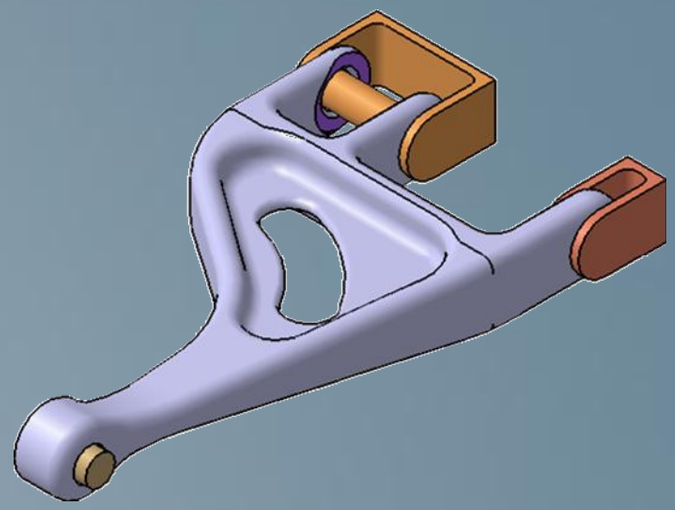
Introduction to Abaqus for CATIA V5

V5-6R2013GA



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About this Course

Course objectives

This course covers:

- Integration of AFC with CATIA V5
- Analysis Cases and Analysis Steps
- Loads, Boundary Conditions and Fields
- Model, Assembly and Part Properties
- Geometric Nonlinearity
- Contact
- Static and Thermal Analysis
- Results Evaluation

Targeted audience

This course is recommended for engineers with experience using Abaqus and CATIA V5, especially the Generative Structural Analysis workbench.

Prerequisites

None

2 days

Day 1

- Lecture 1 — Abaqus for CATIA V5 Overview
- Lecture 2 — Integration of AFC into CATIA V5
- Workshop 1 — Introduction to the AFC Interface
- Lecture 3 — Analysis Cases and Analysis Steps
- Lecture 4 — Defining Model and Part Properties
- Lecture 5 — Defining Loads, Boundary Conditions, and Fields
- Workshop 2 — Defining Loads, Boundary Conditions, and Fields
- Workshop 3 — Defining a Parametric Study and an Analysis Template
- Workshop 4 — Analysis Assembly
- Workshop 5 — Optimization of an I-beam

Day 2

- Lecture 6 — Assembly Properties
- Lecture 7 — Obtaining and Evaluating Results
- Lecture 8 — Best Practices

- Workshop 6 — Linear vs. Nonlinear - Analysis of a Skew Plate
- Workshop 7 — Structural Analysis of an Automotive Control Arm
- Workshop 8 — Working with Composite Shells Including Spot Welds and Contact
- Workshop 9 — Contact Pair vs. General Contact - Lap Joint Analysis
- Workshop 10 — Understanding Contact using an Analysis of a Syringe
- Workshop 11 — Explicit Dynamics Analysis of a Crushable Tube
- Workshop 12 — Thermal-Stress Analysis of a Disk Brake
- Workshop 13 — Defining Assembly Constraints and Bolt Tightening Connections
- Workshop 14 — Introduction to Composite Analysis
- Workshop 15 — Steady State Dynamic Analysis of a Hood
- Workshop 16 — Submitting a Job using the Analysis Batch Utility
- Workshop 17 — Building and Executing a CAA Workspace

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Revision Status

Lecture 1	3/14	Updated for V5-6R2013GA
Lecture 2	3/14	Updated for V5-6R2013GA
Lecture 3	3/14	Updated for V5-6R2013GA
Lecture 4	3/14	Updated for V5-6R2013GA
Lecture 5	3/14	Updated for V5-6R2013GA
Lecture 6	3/14	Updated for V5-6R2013GA
Lecture 7	3/14	Updated for V5-6R2013GA
Lecture 8	3/14	Updated for V5-6R2013GA
Demonstration 1	3/14	Updated for V5-6R2013GA

Workshop 1	3/14	Updated for V5-6R2013GA
Workshop 2	3/14	Updated for V5-6R2013GA
Workshop 3	3/14	Updated for V5-6R2013GA
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Workshop 7	3/14	Updated for V5-6R2013GA
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Workshop 12	3/14	Updated for V5-6R2013GA
Workshop 13	3/14	Updated for V5-6R2013GA
Workshop 14	3/14	New for V5-6R2013GA
Workshop 15	3/14	New for V5-6R2013GA
Workshop 16	3/14	New for V5-6R2013GA
Workshop 17	3/14	New for V5-6R2013GA

Lesson 1: Abaqus for CATIA V5 Overview

Lesson content:

- Abaqus FEA and AFC
- Abaqus for CATIA V5 Features
- AFC-GPS Features Comparison
- AFC Licensing
- Linear vs. Nonlinear Analysis

30 minutes

Lesson 2: Integration of AFC into CATIA V5

Lesson content:

- AFC Prerequisites and Co-requisites
- Units
- Material Properties
- Assembly Constraints
- Knowledgeware
- Templates and Publications
- Automation
- Job Submission
- Results Visualization
- Assembly of Analysis
- Product Engineering Optimizer (PEO)
- Specification Tree Design
- Workshop Preliminaries
- Workshop 1: Introduction to the AFC Interface

2 hours

Lesson 3: Analysis Cases and Analysis Steps

Lesson content:

- What is an Analysis Case?
- Structure of an Analysis Case
- Defining an Analysis Case
- What is an Analysis Step?
- Structural Static Analysis Steps
- Structural Dynamic Analysis Step
- Thermal Analysis Step
- Step Succession Rules
- Step Succession Example
- Current Analysis Case and Step
- Demonstration 1

30 minutes

Lesson 4: Defining Model and Part Properties (1/2)

Lesson content:

- Properties Overview
- Mesh and Model Properties
- Mesh Parts
- Material Properties
- Mesh Properties
- Global Element Assignment
- Local Element Assignment
- Modeling Techniques
- Composites
- Importing Composite Properties from the Composite Design Workbench
- XML Mapping Files for Composite Properties

45 minutes

Lesson 5: Defining Loads, Boundary Conditions, and Fields

Lesson content:

- Propagation and Activation Status
- Amplitudes
- Tabular / Smooth Step Amplitude
- Local Axis Systems
- User Subroutines
- Groups
- Selection Sets
- Nonlinear Structural Analysis Workbench
  - Boundary Conditions, Loads, and Fields
- Thermal Analysis Workbench
  - Boundary Conditions, Loads, and Fields
- Workshop 2: Defining Loads, Boundary Conditions, and Fields
- Workshop 3: Defining a Parametric Study and an Analysis Template
- Workshop 4: Analysis Assembly
- Workshop 5: Optimization of an I-beam

5 hours

Lesson 6: Assembly Properties (1/2)

Lesson content:

- Assembly Properties
- Assembly Constraints
- Analysis Connections
- Surface Specifications
- Contact Pairs
- Mechanical Connection Behavior
- Thermal Connection Behavior
- More on Contact Pairs
- General Contact
- Fastened Pair
- Cyclic Symmetry
- Interaction Wizard

75 minutes

Lesson 7: Obtaining and Evaluating Results (1/2)

Lesson content:

- Tools Options
- Abaqus Files
- Output Requests
- Job Management Components
- Consistency Checking
- Job Creation
- Job Manager
- Job Monitor
- Storage Manager
- Postprocessing Tools
- Accessing Results
- Generating Images of the Results
- Editing Images of the Results

1 hour

Lesson 8: Best Practices (1/2)

Lesson content:

- Understanding Common Warning Messages
- Contact Convergence
- Element Selection
- Solid Element Selection Summary
- Shell Element Selection Summary
- Beam Element Selection Summary

3 hours