

## Learning Module

# Metal Inelasticity in Abaqus

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This seminar provides a brief overview of the inelastic behavior observed in metals and the basic concepts of plasticity theory.

### Objectives

Upon Completion Of This Course You Will Be Able To:

- Metals that show inelastic work hardening.
- The Bauschinger effect.
- "Ratchetting" and relaxation of the mean stress under cyclic loading.
- Strain-rate-dependent inelastic behavior.
- Temperature-dependent plasticity.
- Heat generated by plastic deformation.
- Ductile failure of metallic materials.
- Plastic behavior in porous and brittle (cast iron) metals.
- Creep behavior in metals.

### Knowledge Prerequisites

This course is recommended for engineers with experience using Abaqus

### Brands

Simulia

### Available Releases

SIMULIA 2021, SIMULIA 2020, SIMULIA 2019, SIMULIA 2018, SIMULIA 2017, SIMULIA 2016, SIMULIA V6.14, SIMULIA V6.13, SIMULIA V6.12

### Duration

16 hours

### Discipline

Advanced Abaqus

### Language(s) for selected release

English

## Contents

Overview - Metal Inelasticity in Abaqus

- 1 - Introduction
- 2 - Ductile Metal Response
- 3 - Classical Metal Plasticity in Abaqus
- 4 - Johnson-Cook Plasticity
- 5 - Metal Failure Models
- 6 - Creep and Swelling
- 7 - Two-Layer Viscoplasticity
- 8 - Gray Cast Iron Plasticity
- 9 - Time Integration
- A1 - Basic Concepts of Plasticity Theory
- A2 - Porous Metal Plasticity
- A3 - References