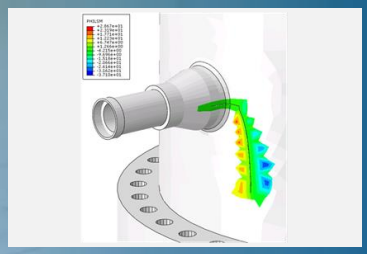
MODELING FRACTURE AND FAILURE WITH ABAQUS

SIMULIA COURSE DESCRIPTION



Level: Advanced
Products: Abaqus
Disciplines: Structures

Audience
This course is recommended for simulation analysts who will perform fracture and failure studies.

Why take this course?

Fracture and failure modeling allows for product designs that maximize the safe operating life of structural components. Abaqus offers many capabilities that enable fracture and failure modeling. This course provides a detailed discussion of these capabilities.

What will you learn?

Upon completion of this course you will be able to:

- Use proper modeling techniques to capture crack-tip singularities in fracture mechanics problems
- Use proper modeling techniques for finite-strain (nonlinear) fracture mechanics problems
- Use Abaqus/CAE to create meshes appropriate for fracture studies
- Calculate stress intensity factors and contour integrals around a crack tip
- Simulate material damage and failure
- Simulate crack growth using cohesive behavior, VCCT and XFEM
- Simulate low-cycle fatigue crack growth

Explore Your Learning Options

Live Sessions	Engage in Real-Time, interactive group workshops guided by experts. Learn and collaborate live in your preferred language and time zone.	Join a live session
On-Demand Learning	Access expert-designed courses anytime, anywhere. Perfect for independent learners looking to build skills on their schedule.	Start Learning Now
Private Training	Exclusive, tailor-made sessions designed to meet your team's unique goals with expert guidance.	Contact Us for Custom Training

> **Gain hands-on experience and master real-world workflows through guided, practical training sessions.**
>
> Apply nonlinear analysis techniques to simulate complex structural and multiphysics problems accurately.
>
> – SIMULIA Training Expert Team

What You Need to Know Before Starting

Introduction to Abaqus or equivalent and experience using Abaqus.

Agenda for Virtual Live Sessions

Participate in hands-on, real-time workshops where you'll gain practical expertise. Here's what you'll cover:

Join an Instructor Led Session

Day 1

Lesson 1: Basic Concepts of Fracture Mechanics
Lesson 2: Fracture Analysis of Sharp Cracks
Workshop 1: Crack in a Three-point Bend Specimen
Lesson 3: General Fracture Analysis
Workshop 2: Crack in a Helicopter Airframe Component

Day 2

Lesson 4: Material Failure and Wear
Lesson 5: Element-based Cohesive Behavior
Workshop 3: Crack Growth in a Three-point Bend Specimen using Cohesive Connections (Part 1)
Workshop 4: Crack Growth in a Helicopter Airframe Component using Cohesive Elements
Lesson 6: Surface-based Cohesive Behavior
Workshop 3: Crack Growth in a Three-point Bend Specimen using Cohesive Connections (Part 2)

Day 3

Lesson 7: Virtual Crack Closure Technology (VCCT)
Workshop 5: Crack Growth in a Three-point Bend Specimen using VCCT
Lesson 8: Fatigue Crack Growth
Lesson 9: Mesh-independent Fracture Modeling (XFEM)
Workshop 6: Crack Growth in a Three-point Bend Specimen using XFEM
Workshop 7: Modeling Crack Propagation in a Pressure Vessel with Abaqus using XFEM

Additional Material

Appendix 1: Other Fracture Mechanics Techniques
Appendix 2: Focused Mesh with Keywords

Want to Learn More?

Expand your knowledge by exploring our course Catalog and browsing learning paths on Eduspace, our dedicated e-learning platform.

Join the Community!

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