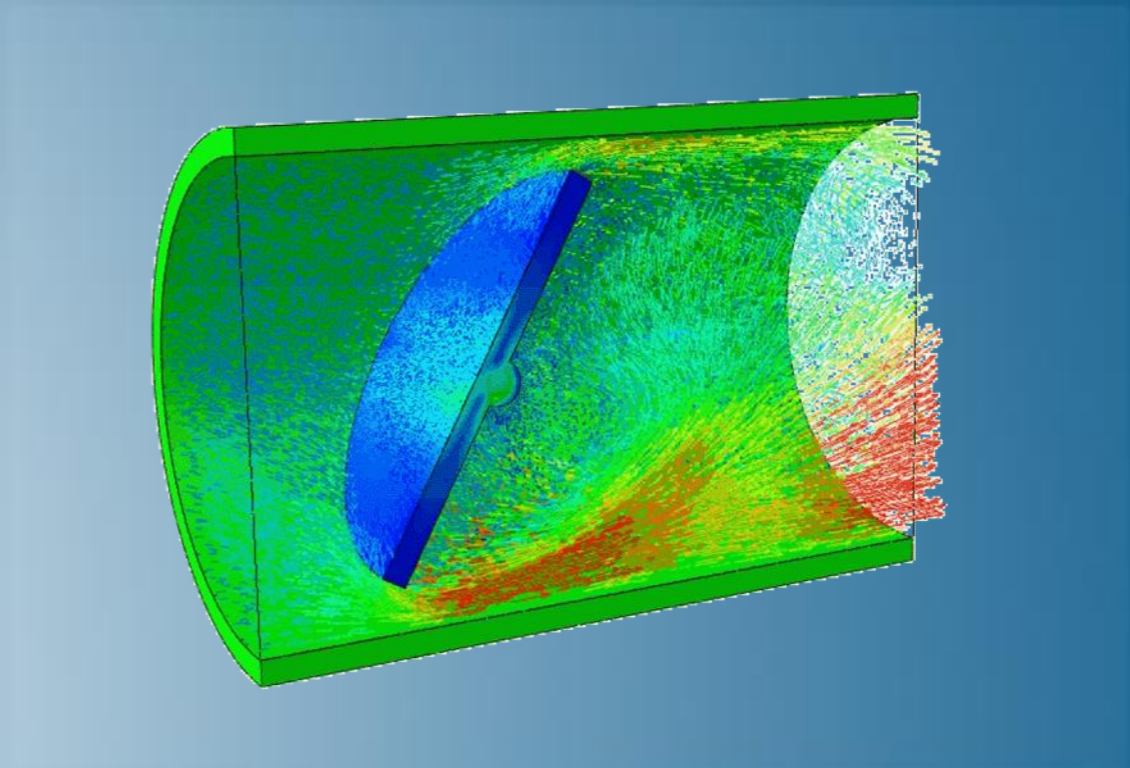


Multiscale Experiment Creation Essentials

R2017x



3DEXPERIENCE[®]



About this Course

Course objectives

Upon completion of this course you will be able to:

- ▶ Set up and create models for co-simulation analysis in the **3DEXPERIENCE** Platform
- ▶ Perform co-simulation analyses
- ▶ Postprocess co-simulation analyses

Targeted audience

This course is intended for the following roles:

- ▶ Multiscale Systems Specialist
- ▶ Multiscale Experiment Creator
- ▶ Multiscale Systems Analyst

Prerequisites

The following courses are required prior to taking this one:

- ▶ Mechanical Scenario Creation Essentials
- ▶ Fluid Mechanics Analyst Essentials



4 hours

Day 1

- ▶ Lesson 1 Introduction to Multiphysics/Multiscale Simulations
- ▶ Lesson 2 Getting Started with Multiscale Experiment Creation
- ▶ Lesson 3 3D Physics Co-simulations
- ▶ Workshop 1 Analysis of an Electronic Circuit Board

Join the Community!

How can you maximize the robust technology of the SIMULIA Portfolio ?
Connect with peers to share knowledge and get technical insights

Go to www.3ds.com/slc
to log in or join!



 SIMULIA

Let the SIMULIA Learning Community be *Your* Portal to 21st Century Innovation

Discover new ways to explore how to leverage realistic simulation to drive product innovation. Join the thousands of Abaqus and Isight users who are already gaining valuable knowledge from the SIMULIA Learning Community.

For more information and registration, visit 3ds.com/simulia-learning.
Connect. Share. Spark Innovation.

 | The 3DEXPERIENCE Company

SIMULIA Training

<http://www.3ds.com/products-services/simulia/services/training-courses/>

Home ... SIMULIA SERVICES TRAINING COURSES SCHEDULE & REGISTRATION

SIMULIA

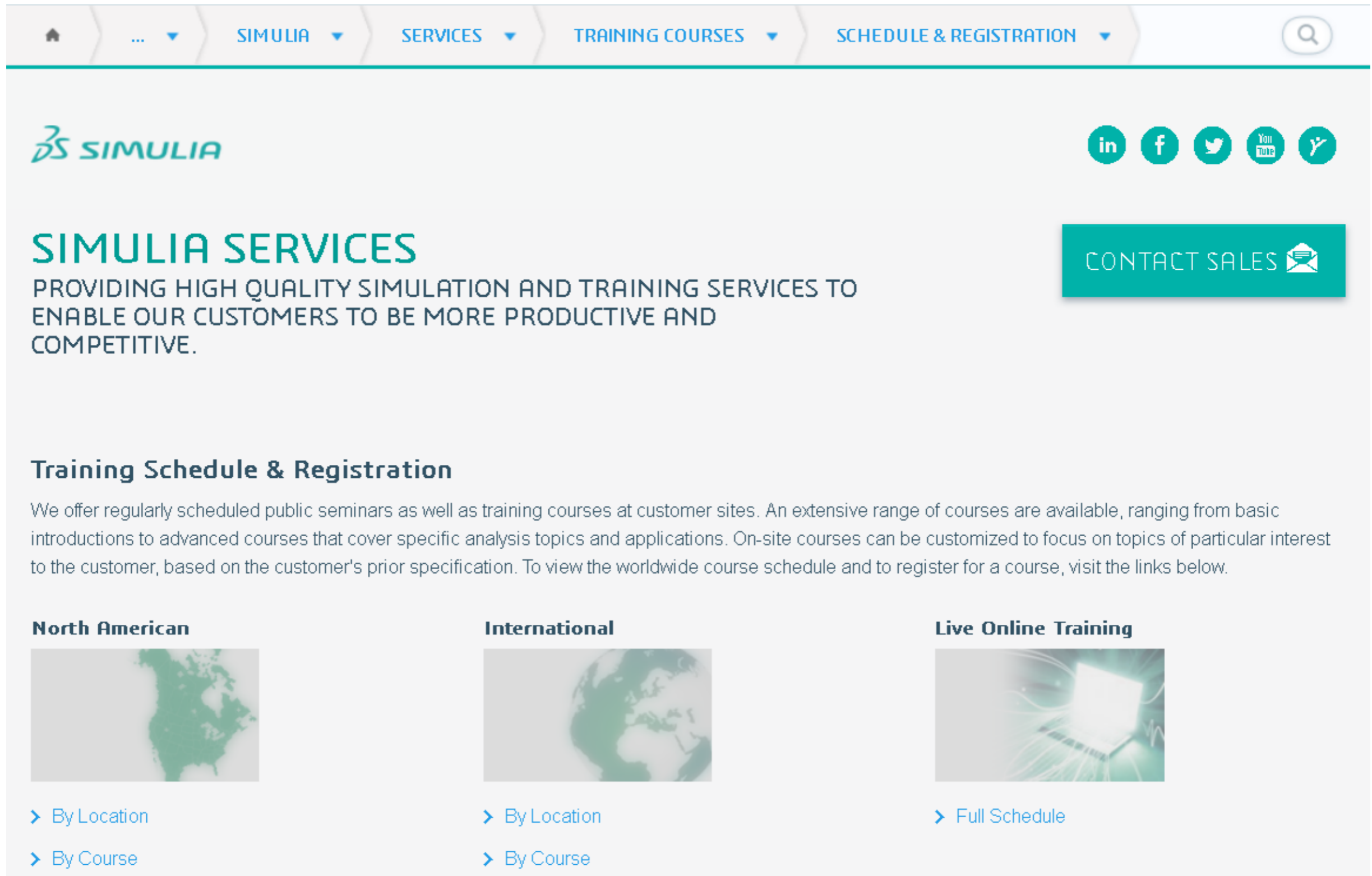


in f t YouTube

SIMULIA SERVICES
PROVIDING HIGH QUALITY SIMULATION AND TRAINING SERVICES TO
ENABLE OUR CUSTOMERS TO BE MORE PRODUCTIVE AND
COMPETITIVE.

CONTACT SALES ✉

Training Schedule & Registration

We offer regularly scheduled public seminars as well as training courses at customer sites. An extensive range of courses are available, ranging from basic introductions to advanced courses that cover specific analysis topics and applications. On-site courses can be customized to focus on topics of particular interest to the customer, based on the customer's prior specification. To view the worldwide course schedule and to register for a course, visit the links below.

North American  <ul style="list-style-type: none">> By Location> By Course	International  <ul style="list-style-type: none">> By Location> By Course	Live Online Training  <ul style="list-style-type: none">> Full Schedule
--	---	---

Legal Notices

The software described in this documentation is available only under license from Dassault Systèmes or its subsidiaries and may be used or reproduced only in accordance with the terms of such license.

This documentation and the software described in this documentation are subject to change without prior notice.

Dassault Systèmes and its subsidiaries shall not be responsible for the consequences of any errors or omissions that may appear in this documentation.

No part of this documentation may be reproduced or distributed in any form without prior written permission of Dassault Systèmes or its subsidiaries.

© Dassault Systèmes, 2017

Printed in the United States of America.

Abaqus, the 3DS logo, and SIMULIA are trademarks or registered trademarks of Dassault Systèmes or its subsidiaries in the US and/or other countries.

Other company, product, and service names may be trademarks or service marks of their respective owners. For additional information concerning trademarks, copyrights, and licenses, see the Legal Notices in the **3DEXPERIENCE** User Assistance.

Revision Status

Lesson 1	4/17	New for R2017x
Lesson 2	4/17	New for R2017x
Lesson 3	4/17	New for R2017x
Workshop 1	4/17	New for R2017x

Lesson 1: Introduction to Multiphysics/Multiscale Simulations

Lesson content:

- ▶ Multiphysics/Multiscale Simulations
- ▶ Multiscale Systems Specialist Role
- ▶ Multiscale Experiment Creation App
- ▶ Authoring Apps
- ▶ Coupling Methodology
- ▶ 3D Physics Co-simulations
- ▶ Fluid-Structure Interaction
- ▶ Conjugate Heat Transfer
- ▶ Structure-to-Structure Co-simulation



30 minutes

Lesson 2: Getting Started with Multiscale Experiment Creation

Lesson content:

- ▶ Multiscale Experiment Creation App
- ▶ Working on the Dashboard
- ▶ Multiscale Experiment Creation App Tools Overview
- ▶ Creating/Opening Experiments
- ▶ Configuring Experiments
- ▶ Executing Experiments
- ▶ Viewing Results



30 minutes

Lesson 3: 3D Physics Co-simulations

Lesson content:

- ▶ Experiment Creation Workflow Overview
- ▶ 3D Physics Co-simulations
- ▶ Preparing 3D Physics Simulations for Multiscale Experiment
- ▶ 3D Physics Co-simulation Coupling Attributes
- ▶ Fluid-Structure Interaction Co-simulation
- ▶ Conjugate Heat Transfer Co-simulation
- ▶ Structure-to-Structure Co-simulation
- ▶ Workshop Preliminaries

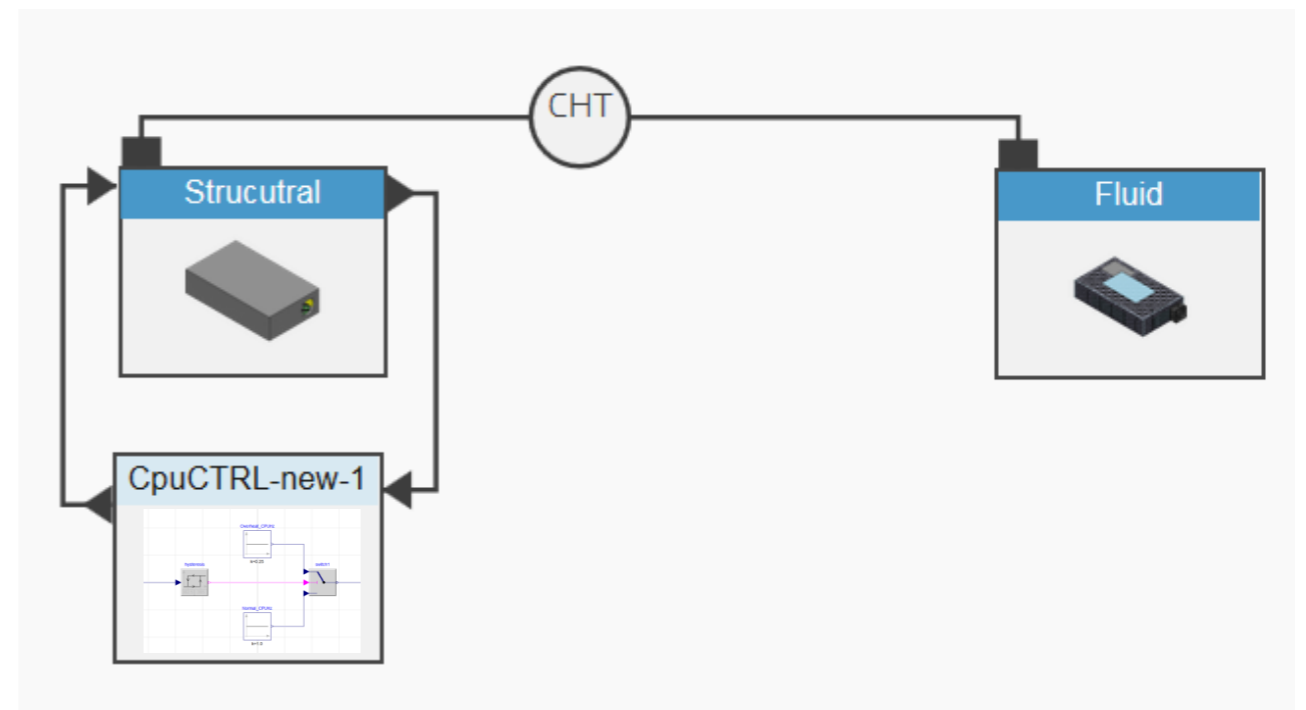
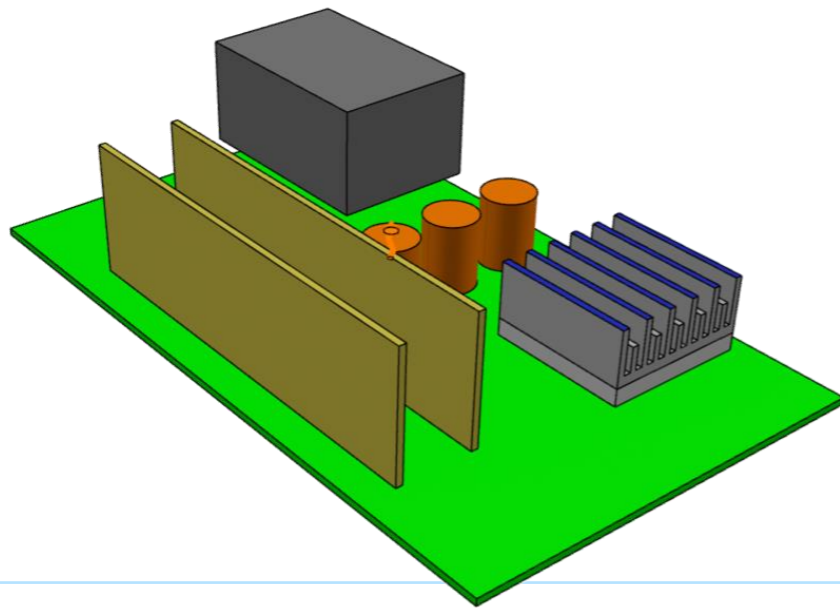


30 minutes

Workshop 1: Analysis of an Electronic Circuit Board

This workshop considers the thermal interaction between an electronic circuit board (structure) and airflow (fluid) which goes through the circuit board enclosure. The air flow is initiated by a fan running on the CPU which controls the heat dissipation of the CPU motherboard. A transient incompressible fluid flow simulation is co-simulated with a transient heat transfer analysis of the structure, which in turn is co-simulated with a 0D logical component controlling the heat source and which is modeled using Modelica language descriptions. The thermal response is modeled using co-simulation with a structural solver rather than with a CFD solver so that the results can be used for a subsequent thermal-stress analysis (not considered here). After completion of this exercise, you will be able to:

- Create a conjugate heat transfer (CHT) analysis.
- Set up the co-simulation between (3D) physics and (0D) logical components.
- Postprocess CHT analysis results.



1.5 hours