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Course Catalog

Learning Experience for SIMULIA Multibody Systems SMMBSLX-OC

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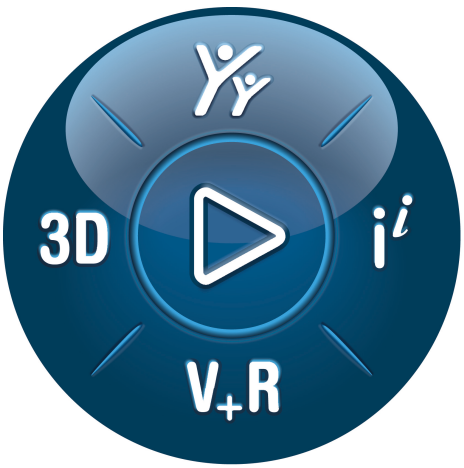

3DEXPERIENCE®

Learning Experience | Course Catalog

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Learning Experience for SIMULIA Multibody Systems - SMMBSLX-OC

Introduction to Isight	
Course Code	SIM-en-ISGT-F-V30R2023
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	14.17 hours
Course Material	
Level	Fundamental
Audience	The course is recommended for new Isight users and anyone else interested in learning more about Isight, including mechanical designers, analysts and methods developers.
Description	This course provides a practical introduction to Isight in which you will learn about process integration and parametric design optimization using Isight. The course includes many hands-on workshops and practical examples.
Objectives	
Prerequisites	None
Available Online	Yes

Introduction to Simpack	
Course Code	SIM-en-SMPKBA-F-V30R2023
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	18.92 hours
Course Material	
Level	Fundamental
Audience	- Simulation analysts and design engineers - Multibody simulation experts with no previous experience of Simpack
Description	SIMULIA Simpack is a general multibody system simulation (MBS) software enabling analysts and engineers to simulate the non-linear motion of any mechanical or mechatronic system. It is particularly well-suited for high frequency transient analyses, even into the acoustic range. SIMULIA Simpack was primarily developed to handle complex non-linear models with flexible bodies and harsh shock contact. This course explains the basics of multibody model set-up, simulation and postprocessing within the SIMULIA Simpack environment and provides a look at best practices and underlying theory to build a base for more advanced Simpack applications.
Objectives	Upon completion of this course you will be able to: - Build multibody models in Simpack - Start the most important Simpack solvers - Postprocess the results - Parameterize models in an efficient way - Set up modular models using Simpack's substructuring concept
Prerequisites	Some familiarity with fundamental multibody concepts

Introduction to Simpack	
Available Online	Yes

Isight Component Development	
Course Code	SIM-en-ISCD-A-V30R2023
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	26.33 hours
Course Material	
Level	Advanced
Audience	Simulation Analysts
Description	Isight is a powerful tool for creating flexible simulation workflows using an extensive library of built-in components. However, it is possible to extend this library by developing custom components which can provide interfaces to third-party simulation codes and/ or extend existing components via custom plug-ins using the power of the Java development language. This course covers the process of designing, building, publishing, debugging and testing custom components and plug-ins, utilizing the Isight SDK. The course is highly interactive with a strong emphasis on practical workshops using a standard Integrated Development Environment (IDE).
Objectives	The topics discussed include the following: - Isight component architecture and introduction to the Isight SKD - Building and testing an Isight component with a custom User Interface - Interfacing with third-party simulation codes written in other languages such as Fortran - Extending the behavior of existing Isight library components - Introduction to the Isight developers plug-in and debugging features using Eclipse IDE

Isight Component Development	
	- Build a custom DOE (Design of Experiments) method plug-in
Prerequisites	The course is recommended for simulation analysts and methods developers who have experience with Isight. Students should be familiar with software development using the Java language.
Available Online	Yes

Optimizing Engineering Methods with Isight	
Course Code	SIM-en-ISOM-A-V30R2023
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	12.17 hours
Course Material	
Level	Advanced
Audience	Simulation Analysts, Scientists
Description	This course provides a brief overview of Isight and optimization before discussing nonlinear optimization theories and applications. Topics such as design space searching, multi-objective optimization, optimization strategy, and multidisciplinary optimization are covered. Attendees will learn key differences between the optimization algorithms offered in Isight, how to choose the preferred method based on the problem, how to remedy issues with run-time performance, and other topics relevant to improving the usage and value of Isight for real engineering optimization problems.
Objectives	The topics discussed include the following: - Design Space Exploration for Optimization problems - Optimization techniques (Gradient Based, Pattern Methods, Exploratory Methods) - Multi Objective Optimization - Nested Exploration and Adaptive DOE - Exploration techniques (Pointer and Pointer 2) - Optimization technique selection strategy
Prerequisites	Introduction to Isight
Available Online	Yes

Simpack Automotive	
Course Code	SIM-en-SMPKAU-A-V30R2023
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	6.67 hours
Course Material	
Level	Advanced
Audience	People who are familiar with Simpack and work in the automotive sector
Description	This course describes the procedure to set-up road vehicle models and introduces Simpack's Automotive elements (tires, roads, steering controllers, etc.). It also explains the Simpack Wizard module which uses databases (e.g. the Automotive Demo Wizard Database) for efficient and fast set ups of parameterized models and load cases.
Objectives	Upon completion of this course you will be able to: - Have a basic knowledge of the Simpack Automotive Elements - Build up models with automotive elements - Build up models from automotive database
Prerequisites	Introduction to Simpack
Available Online	Yes

Simpack Contact Mechanics	
Course Code	SIM-en-SMPKCM-A-V30R2023
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	7 hours
Course Material	
Level	Advanced
Audience	Multibody simulation engineers involved in contact mechanics simulation
Description	This course explains the usage of Simpack's modeling elements for contact mechanics and features that optimize the Simpack solver for generic contact simulations.
Objectives	Upon completion of this course you will be able to: - Use Simpack's modeling elements for contact mechanics and features - Optimize the Simpack solver for generic contact simulations The course covers the following topics: - Overview on contact models and methods in Simpack - Single-point contact search with Moved Markers - Generic 2D and 3D Multi-point contact methods - Contact force calculation on rigid and flexible bodies - Minimum Distance Measurement between arbitrary surfaces - Examples of rigid and flexible body contact
Prerequisites	Before undertaking this course, you should have completed the Introduction to Simpack training course.
Available Online	Yes

Simpack Drivetrain	
Course Code	SIM-en-SMPKDT-A-V30R2023
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	6.83 hours
Course Material	
Level	Advanced
Audience	Simpack users planning to build up and analyze drivetrain models in Simpack
Description	The drivetrain training gives an overview of Simpack modeling elements and analysis methods available for drivetrain applications.
Objectives	Upon completion of this course you will be able to execute drivetrain applications including: - Joints and Constraints - Bushing and bearing elements - Gear pair Force Elements with different levels of detail - Spline coupling - Drivetrain modeling guidelines and recommendations - Drivetrain modeling guidelines Linear resonance analysis - Order analysis - Operating deflection shapes
Prerequisites	Introduction to Simpack Training course successfully finished
Available Online	Yes

Simpack Engine	
Course Code	SIM-en-SMPKEG-A-V30R2023
Available Releases	SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	16.67 hours
Course Material	
Level	Advanced
Audience	Simpack users planning to build up and analyze engine models in Simpack.
Description	This course explains how to use Simpack specific modeling elements for engine applications. These include cranktrain modeling, the Dynamic Spring Generation tool, hydraulic lash adjuster, valvetrain, chain drive systems and Simpack Wizard together with the Engine demo database.
Objectives	Upon completion of this course you will be able to: - • Use Simpack's specific modeling elements for engine applications - • Perform simulations using high fidelity cranktrain models - • Generate and model dynamic springs in Simpack - • Model a hydraulic lash adjuster for chain and valvetrain applications - • Perform kinematic and dynamic analyses of single valvetrain models - • Model a chain drive system - • Understand how to use Simpack Wizard together with the Simpack Engine demo database
Prerequisites	Before undertaking this course, you should have completed the Introduction to Simpack training course.

Simpack Engine	
Available Online	Yes

Simpack Flexible Bodies	
Course Code	SIM-en-SMPKFB-A-V30R2022
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022
Duration	16 hours
Course Material	
Level	Advanced
Audience	Simulation Analysts
Description	This course is about structural flexibility in Simpack. It explains how to import linear finite element (FE) models into Simpack and how to model linear and nonlinear beam structures directly in Simpack.
Objectives	Upon completion of this course you will be able to: - Prepare Abaqus models for use inside Simpack (as an Abaqus substructure) - Integrate finite element models into the Simpack environment - Define appropriate interface connections to the Simpack model - Define appropriate mode selection inside the Simpack environment - Perform Simpack analysis - Perform postprocessing of flexible body results
Prerequisites	This course is recommended for engineers with experience using FEA tools and Simpack
Available Online	Yes

Simpack FlexTrack	
Course Code	SIM-en-SMPKFT-A-V30R2023
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	6.92 hours
Course Material	
Level	Advanced
Audience	- Simpack Rail users interested in advanced train/ track interaction - Engineers involved in dynamic behavior of tracks, bridges, switches and crossings
Description	This course explains how to set up flexible rail track models in Simpack.
Objectives	Upon completion of this course you will be able to: - Set up a finite element-based flexible rail track in Simpack - Prepare FE models for import - Perform Craig-Bampton reduction - Import reduced FE models into Simpack - Select the appropriate FE modeling method - Model nonlinear rail pads and ballast defects
Prerequisites	- Introduction to Simpack training course successfully completed - Simpack Rail training course successfully completed - Optional: Simpack Flexible Bodies training course
Available Online	Yes

Simpack NVH	
Course Code	SIM-en-SMPKNV-A-V30R2023
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	6 hours
Course Material	
Level	Advanced
Audience	Simpack users interested in linear and nonlinear acoustics and vibration analyses will benefit from this course
Description	This course covers the fundamental theory necessary to understand NVH, along with a detailed look at the NVH functionality within Simpack. Using prepared models, participants have the opportunity to experiment with and compare the various methods.
Objectives	Upon completion of this course you will be able to: - Understand NVH fundamentals and application areas - Understand NVH functionality within Simpack: - Frequency response functions - Linear system response - Spectral analysis - Frequency sweep - Nonlinear Frequency Pass - Order Analysis - Operating Deflection Shapes - Use these methods with complete road and rail vehicles
Prerequisites	Introduction to Simpack course successfully completed
Available Online	Yes

Simpack Rail	
Course Code	SIM-en-SMPKRA-A-V30R2023
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	13.75 hours
Course Material	
Level	Advanced
Audience	- Simulation analysts and design engineers in the railway industry - Multibody simulation experts with no previous experience of railway simulation in Simpack
Description	The Simpack Rail training explains how to use Modeling Elements to simulate rail-wheel contact, how to set up entire vehicle models, and the most important analysis types for rail vehicles. It also introduces rail vehicle specific elements such as tracks, irregularities, wheel and rail profiles as well as suspension elements.
Objectives	Upon completion of this course you will be able to: - Understand all necessary elements for railway modeling - Set up railway vehicles according to common concepts - Set up, run and analyze typical applications for railway models
Prerequisites	- Before undertaking this course, you should have completed the Introduction to Simpack training course - Familiarity with fundamental railway theory is recommended
Available Online	Yes

Simpack Scripting	
Course Code	SIM-en-SMPKSC-A-V30R2023
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	5.58 hours
Course Material	
Level	Advanced
Audience	Simpack users wishing to automate any tasks in Simpack
Description	This course explains how to automate tasks in Simpack Pre and Post through scripting. It provides user experience in terms of writing, running and debugging scripts.
Objectives	This course provides an overview of the Simpack scripting capabilities and possible applications. Upon completion of this course you will be able to: - Understand the basics of the scripting languages. - Use Simpack-specific scripting classes. - Create examples for the most common scripting applications. - Write, run and debug scripts.
Prerequisites	Completion of the Simpack Basics training course. Basic programming knowledge is required.
Available Online	Yes

Simpack User Routines	
Course Code	SIM-en-SMPKUR-A-V30R2023
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	7.75 hours
Course Material	
Level	Advanced
Audience	Simpack users wishing to extend the applications available through the standard Simpack element library.
Description	The User Routines training explains how to add user-defined functionality to Simpack by means of Fortran subroutines.
Objectives	Upon completion of this course you will be able to: - Define element parameters including selection menus and units - Program a force law using Simpack states - Program a Simpack filter - Incorporate external routines and libraries into Simpack - Debug user programmed elements
Prerequisites	Completion of the Introduction to Simpack training course. Basic programming skills are recommended
Available Online	Yes

Simpack Wind	
Course Code	SIM-en-SMPKWD-A-V30R2023
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	7 hours
Course Material	
Level	Advanced
Audience	Simpack users planning to build up and analyze wind turbine models in Simpack.
Description	This course explains how to set up wind turbine models in Simpack, how to use the rotorblade generator with linear and nonlinear SIMBEAM elements, wind specific elements (including the interfaces to AeroDyn and HydroDyn), and how to use the Simpack wind load calculation tool.
Objectives	Upon completion of this course you will be able to: - Understand Simpack Wind turbine applications - Model structural components (onshore and offshore foundation, tower, nacelle) - Generate and model Rotorblades in Simpack - Conduct Aero- and Hydro-elastic simulation - Use the Load Calculations Tool - Model high fidelity drivetrains - Conduct a resonance analysis according to GL 2010
Prerequisites	- The prerequisites for this course are successful completion of the courses: - Introduction to Simpack - Simpack Flexible Body
Available Online	Yes

Uncertainty Quantification with Isight	
Course Code	SIM-en-ISUQ-A-V30R2023
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	8.25 hours
Course Material	
Level	Advanced
Audience	Simulation Analysts, Design Engineers, Quality Engineers, Manufacturing Engineers, Reliability Engineers, Students and anyone interested in performing stochastic analysis
Description	This course introduces Isight users to methods dealing with statistical behavior as a result of variability in the system. It motivates why uncertainty quantification (UQ) analysis is important, presents concepts and methods in Isight to do UQ analysis, and shows how to use Isight's open architecture to integrate user-developed algorithms into components as plug-ins.
Objectives	Upon completion of this course you will be able to: - Use various Isight components to perform stochastic analysis - Understand concepts used in Taguchi, Reliability and Six Sigma methods
Prerequisites	Introduction to Isight
Available Online	Yes


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