DASSAULT SYSTEMES | The 3DEXPERIENCE® Company

Course Catalog

Learning Experience for SIMULIA Workflows

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3DEXPERIENCE®

Learning Experience | Course Catalog

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Learning Experience for SIMULIA Aerospace & Defense Workflows - SMADCW-OC

Experience Airframe Aerodynamic Noise for Aerospace and Defense	
Course Code	SIM-en-PFACN-A-V30R2022
Available Release	SIMULIA 2022
Duration	7.83 hours
Course Material	
Level	Advanced
Audience	- CFD analysts, Aeroacoustics engineers, Certification engineers and System engineers. - - [Roels] - Multidisciplinary Optimization Engineer - PowerFLOW Aeroacoustics - All Physics Analyst
Description	This course outlines the process used to perform aeroacoustics analysis using PowerFLOW. This course also introduces the Airframe Aerodynamic Noise workflow, geometry preparation using PowerDELTA, case setting using PowerCASE, running simulations, and post-processing.
Objectives	The purpose is to: - 1. Identify aircraft noise sources - 2. Mitigate identified noise sources through design changes and 3. development and evaluation of appropriate noise reduction concepts - 4. Reduce overall noise levels while complying with other design and performance constraints - 5. Achieve certified noise levels and meet airport-specific community noise level targets - 6. Minimize the cost of physical testing in the wind tunnel and flight tests

Experience Airframe Aerodynamic Noise for Aerospace and Defense	
Prerequisites	Basic knowledge of PowerFLOW, PowerDELTA, ANSA, far-field noise propagation methods, and Python scripting language.
Available Online	Yes

Experience Antenna Design for Aerospace and Defense	
Course Code	SIM-en-ACDSP-A-V30R2022
Available Release	SIMULIA 2022
Duration	3.33 hours
Course Material	
Level	Advanced
Audience	Aircraft OEM simulation engineers, technical managers and decision makers
Description	This training will provide hands-on experience for the process of virtually validating antenna communication for aerospace applications, determining the antenna performance when installed on an aircraft, and minimizing interference problems due to multiple coexisting radio systems at a very early design stage. Such validation leads to better performance and a reduced overall device design time.
Objectives	After completing this training, you will be able to understand the basics of each workflow, have an appreciation for virtual validation in electromagnetic simulation, and be introduced to the usage of CST Studio Suite for aerospace communication and detection system performance in aircraft applications.
Prerequisites	
Available Online	Yes

Experience Antenna Placement for Aerospace and Defense	
Course Code	SIM-en-APAD-A-V30R2022
Available Release	SIMULIA 2022
Duration	1.50 hours
Course Material	
Level	Advanced
Audience	Aircraft OEM simulation engineers and technical managers
Description	Modern aircraft host a large number of antennas for communication, navigation and detection. Placing antennas on the aircraft platform alters the antenna performance. This needs to be considered when simulating aircraft communication.
Objectives	To introduce the concepts required to complete antenna placement simulation using CST Studio Suite.
Prerequisites	Fundamental understanding of aerospace industry and electromagnetics simulation terminologies. Usage of CST Studio Suite.
Available Online	Yes

Experience Co-site Interference Mitigation for Aerospace and Defense	
Course Code	SIM-en-CIMAD-A-V30R2022
Available Release	SIMULIA 2022
Duration	1 hours
Course Material	
Level	Advanced
Audience	Aircraft OEM simulation engineers and technical managers
Description	Co-site Interference Analysis is based on the interference task in SIMULIA CST Studio Suite. It allows the user to analyze interferences between all of the aircraft-installed receivers and transmitters. The violation matrix helps the engineer visualize all violations.
Objectives	To introduce the concepts required to complete co-site interference mitigation simulation using CST Studio Suite.
Prerequisites	
Available Online	Yes

Experience Electromagnetic Environmental Effects (E3) Analysis and Mitigation for Aerospace and Defense	
Course Code	SIM-en-ASEP-A-V30R2022
Available Release	SIMULIA 2022
Duration	2.77 hours
Course Material	
Level	Advanced
Audience	Electromagnetic Environmental Effects engineer, Aerospace EMC engineer
Description	This training will provide hands-on experience for the industry process experience aerospace system electromagnetic performance. It is about electromagnetic simulation for electromagnetic environmental effects analysis. Besides testing and similarity, analysis is an acceptable method for aircraft certification. The complementary usage of simulation and testing allows for a more rigorous investigation of aircraft electromagnetic performance in a shorter time, at a lower cost, and for the benefit of higher aircraft safety.
Objectives	After completing this training, you will be able to understand the basics of each workflow, have an appreciation for electromagnetic environmental effects analysis, and be introduced to the usage of CST Studio Suite for aerospace system electromagnetic performance in aircraft applications.
Prerequisites	- Introduction to CST Studio Suite - CST Studio Suite - EMC/EMI

Experience Electromagnetic Environmental Effects (E3) Analysis and Mitigation for Aerospace and Defense	
Available Online	Yes

Experience Full Vehicle Performance for Aerospace and Defense	
Course Code	SIM-en-RVAAP-A-V30R2022
Available Release	SIMULIA 2022
Duration	4.75 hours
Course Material	
Level	Advanced
Audience	Physics Analyst, Composite Structures Analysis Engineer, Dynamic Systems Engineer, Fluid Dynamics Engineer, Mechanical & Shape Designer, Multidisciplinary Optimization Engineer, PowerFLOW Aeroacoustics, and PowerFLOW Aerodynamics.
Description	Rotorcraft & eVTOL Vehicle Aerodynamic and Aeroacoustic Performance IPE describe how to perform the full aerodynamic and aeroacoustics design process, which also requires aero-mechanics and Fluid/Structure Interaction (FSI) for rotorcraft and electric vertical take-off and landing vehicles. The workflows covered include dimensioning of lifting and propulsion systems, vertical/horizontal flight aeromechanics, system optimization, final performance assessment, and acoustic impact.
Objectives	You will be able to learn how to use PowerFLOW to run transient simulations to evaluate the acoustic implications of design changes for aircraft and their effect on aerodynamic performance. - - These simulations can help you understand and separate noise sources long before a physical prototype is available for flight tests while providing a deeper insight into the physical noise mechanisms. -

Experience Full Vehicle Performance for Aerospace and Defense	
	- You will be able to integrate acoustic simulations into the initial design stages and multi-disciplinary optimization.
Prerequisites	- Fundamentals (basic functionalities and user interface) of CFD - (PowerFLOW) and FSI
Available Online	Yes

Experience Lightning Strike Protection for Aerospace and Defense	
Course Code	SIM-en-LSPAD-A-V30R2022
Available Release	SIMULIA 2022
Duration	2.68 hours
Course Material	
Level	Advanced
Audience	Electromagnetic Environmental Effects engineer, Aerospace EMC engineer
Description	The lightning strike protection workflow is used to characterize initial attachment zones and for lightning electromagnetic pulse indirect effects analysis and mitigation.
Objectives	After completing this training, you will be able to understand the basics of each workflow, have an appreciation for electromagnetic environmental effects analysis, and be introduced to the usage of CST Studio Suite for aerospace system electromagnetic performance in aircraft applications.
Prerequisites	- Introduction to CST Studio Suite - CST Studio Suite - EMC/EMI
Available Online	Yes

Experience Metal Structure Strength for Aerospace and Defense	
Course Code	SIM-en-SLSV-A-V30R2022
Available Release	SIMULIA 2022
Duration	4.42 hours
Course Material	
Level	Advanced
Audience	- Structural design engineers - Sub-system product engineers - Sub-system modeling (CAE) engineers - Stress analyst - [Roles] - Multidisciplinary Optimization Engineer - Simulation Model Build Engineer - Composite Structures Analysis Engineer
Description	This course covers the Metal Structure Stength workflow. Develop and virtually validate all sub-systems and components of an aerospace structure. The goal is to prove that they are designed properly so that structural integrity is ensured in all phases of flight. Regulatory agencies issue regulations with respect to structural validation. There are two critical regulations: 1. Compliance with strength and deformation requirements. 2. The design must follow either a Safe-Life or Damage-Tolerant design approach.
Objectives	After completing this workflow course, the user will learn the basics of configuring workflow and be able to review the results.
Prerequisites	Fundamental understanding of aerospace industry and structural simulation terminology.

Experience Metal Structure Strength for Aerospace and Defense	
Available Online	Yes

Learning Experience for SIMULIA Energy & Materials Workflows - SMEMCW-OC

Experience DigitalROCK-Petrophysical Characterization Energy and Materials	
Course Code	SIM-en-DPCEM-A-V30R2022
Available Release	SIMULIA 2022
Duration	1.42 hours
Course Material	
Level	Advanced
Audience	- Petroleum Reservoir Engeers, Resevoir Simulation Expert - [Roles] - SIMULIA Cloud DigitalROCK Analysis Unit - Multidisciplinary Optimization Engineer - DigitalROCK Porous Media Characterization Engineer - DigitalROCK Simulation Core
Description	This course DigitalROCK is a cloud based simulation tool for characterizing petrophysical properties of a micro rock sample. The DigitalROCK analysis recreates these rock samples by processing micro-ct-scan data, simulating fluid flow, and characterizing several properties such as: porosity, permeability, capillary pressure, relative permeability, wettability, initial water saturation, and others. This helps in oil field development planning, production optimization and risk assessment. DigitalROCK addresses the first step in the Unified Oil Field Management process.
Objectives	To be able to understand the DigitalROCK analysis, which recreates these rock samples by processing micro-ct-scan data, simulating fluid flow, and characterizing several properties.
Prerequisites	

Experience DigitalROCK-Petrophysical Characterization Energy and Materials	
Available Online	Yes

Learning Experience for SIMULIA High-Tech Workflows - SMHTCW-OC

Experience CMA Analysis High-Tech	
Course Code	SIM-en-AEAC-A-V30R2022
Available Release	SIMULIA 2022
Duration	2.67 hours
Course Material	
Level	Advanced
Audience	- Antenna engineers, RF engineers, system integration engineers, and EM engineering specialists. - [Roles] - Multidisciplinary Optimization Engineer - All Physics Analyst - CST Studio Suite Filter Designer 3D - CST Studio Suite EDA Import Token - CST Studio Suite Antenna Magus - CST Studio Suite Package - CST Studio Suite SPARK3D - Simulation Process Engineer
Description	This course provides an introduction to the Antenna Engineering & Certification IPE for designing and optimizing antennas in devices at a very early design stage to reduce the overall development time while ensuring that the design satisfies required certification tests. A workflow examining multiple antennas in a mobile phone will illustrate the process. To download workshop files, click Resource button at the top right corner of the AEC More Training Resources module.
Objectives	To be able to design and optimize antennas in devices at a very early design stage to reduce the overall development time while ensuring that the design satisfies required certification tests.
Prerequisites	

Experience CMA Analysis High-Tech	
Available Online	Yes

Experience Device EMC/EMI Performance EMC High-Tech	
Course Code	SIM-en-DPEMC-A-V30R2022
Available Release	SIMULIA 2022
Duration	2.90 hours
Course Material	
Level	Advanced
Audience	- EMC Engineer Specialist and System Integration Engineers. - [Roles] - Electromagnetics Engineer - Multidisciplinary Optimization Engineer - All Physics Analyst - CST Studio Suite Filter Designer 3D - CST Studio Suite EDA Import Token - CST Studio Suite Antenna Magus - CST Studio Suite IdEM - CST Studio Suite Package - CST Studio Suite SPARK3D - Simulation Process Engineer - Collaborative Designer for Altium Designer
Description	This course provides a comprehensive introduction to the Device EMC/EMI Performance IPE for virtually validating electronic devices like printed circuit boards (PCB), connectors, cables and enclosures against electromagnetic compatibility (EMC) and electromagnetic interference (EMI) issues at a very early design stage, leading to better performance and a reduced overall time-to-market. A workflow examining a buck converter will illustrate the process.
Objectives	To be able to understand how to detect issues early in the design process under the pressure of increasing

Experience Device EMC/EMI Performance EMC High-Tech	
	system complexity and additional demands to reduce size, cost, and development time.
Prerequisites	
Available Online	Yes

Experience Drop Test High-Tech	
Course Code	SIM-en-DSP-A-V30R2022
Available Release	SIMULIA 2022
Duration	5 hours
Course Material	
Level	Advanced
Audience	- Device manufacturer simulation engineers - [Roles] - Multidisciplinary Optimization Engineer - Structural Performance Engineer - Simulation Process Engineer - Structural Analysis Engineer
Description	The user will learn the requirements and recommendations for executing the simulation process and gain a better understanding of the results. Avoiding a cracked screen is a leading cause of consumer concern. You will be able to learn to simulate a drop and automate design exploration & postprocess the results of each.
Objectives	To introduce the user to the challenges facing device manufacturers and the benefits of structural simulation on the 3DEXPERIENCE platform. Each workflow in this IPE training will introduce users to the simulation concepts required to run the workflow and give the steps to complete the workflow using a representative model.
Prerequisites	Fundamental understanding of consumer device terminologies. Usage of Mechanical Scenario Creation app. Basic understanding of of explicit dynamic simulation.

Experience Drop Test High-Tech	
Available Online	Yes

Learning Experience for SIMULIA Transportation & Mobility Workflows - SMTMCW-OC

Experience Brake Cool down Placement Transportation and Mobility	
Course Code	SIM-en-BSE-A-V30R2022
Available Release	SIMULIA 2022
Duration	4.22 hours
Course Material	
Level	Advanced
Audience	Brake System Engineer, Thermal Engineer, Aerothermal Engineer, and Systems Engineer
Description	This course covers the workflow for brake cooldown simulation. The user will learn the requirements and recommendations for executing the simulation process and better understand the results. The course consists of modules explaining geometry preparation, case setup, coupled-model simulation, setup for transient thermal simulation, transient cooldown simulation, and post-processing.
Objectives	To be able to accurately predict this critical thermal performance of a brake system, under driving conditions, and to aid the design of vehicles that are aerodynamically efficient, safe, and durable.
Prerequisites	The user is required to take training in PowerFLOW basics before beginning this course. He/she needs some knowledge of PowerTHERM and PowerDELTA.
Available Online	Yes

Experience Brake Duty Cycles Transportation and Mobility	
Course Code	SIM-en-BDCTM-A-V30R2022
Available Release	SIMULIA 2022
Duration	4.28 hours
Course Material	
Level	Advanced
Audience	Systems Architect, Systems Engineer, Controls Engineer, Brake system engineer, Chassis or braking engineer, Brake design engineer, Aerothermal engineer, Thermal Engineer, Propulsion Engineer, Test Engineer
Description	This course covers the workflow for brake duty cycle simulation. The goal is to accurately predict this critical thermal performance of a brake system, over a given drive cycle, and aid the design of vehicles that are aerodynamically efficient, safe, and durable. The user will learn the requirements and recommendations for executing the simulation process and better understand the results. The course consists of modules explaining geometry preparation, case setup, coupled-model simulation, setup for the transient thermal model, transient drive cycle simulation, and post-processing.
Objectives	To be able to accurately predict this critical thermal performance of a brake system, over a given drive cycle, and aid the design of vehicles that are aerodynamically efficient, safe, and durable.
Prerequisites	The user is required to take training in PowerFLOW basics before beginning this course. He/she needs some knowledge of PowerDELTA.

Experience Brake Duty Cycles Transportation and Mobility	
Available Online	Yes

Experience Brake Soiling Transportation and Mobility	
Course Code	SIM-en-BSOTM-A-V30R2022
Available Release	SIMULIA 2022
Duration	2.70 hours
Course Material	
Level	Advanced
Audience	Systems Architect, Systems Engineer, Controls Engineer, Brake system engineer, Chassis or braking engineer, Brake design engineer, Aerothermal engineer, Thermal Engineer, Propulsion Engineer, Test Engineer
Description	This course covers the workflow for brake dust soiling simulation. The goal is to accurately predict the contamination due to brake dust particles, and design cleaner brake systems without compromising aerodynamic efficiency. The user will learn the requirements and recommendations for executing the simulation process and better understand the results. The course consists of the modules explaining geometry preparation, case setup, simulation with brake particles, and post-processing.
Objectives	To be able to accurately predict the contamination due to brake dust particles, and design cleaner brake systems without compromising aerodynamic efficiency.
Prerequisites	The user is required to take training in PowerFLOW basics before beginning this course. He/she needs some knowledge of PowerDELTA.
Available Online	Yes

Experience Brake Squeal Transportation and Mobility	
Course Code	SIM-en-BSQTM-A-V30R2022
Available Release	SIMULIA 2022
Duration	2 hours
Course Material	
Level	Advanced
Audience	Brake System Engineer, Thermal Engineer, Aerothermal Engineer, and Systems Engineer
Description	This course covers the workflow for the complex-mode method of disc brake squeal simulation. Disc brake squeal is associated with unstable complex modes of the brake system. The purpose of the brake squeal simulation is to identify any unstable complex modes in a disc brake system design and to study the effects of changes in design parameters on the unstable modes. The ultimate goal is to design a quiet brake system. The user will be introduced to the basics of the complex-mode method. The user will learn how to execute the method by working through a computer exercise with a step-by-step procedure for building the simulation and post-processing the results. Topics introduced include: 1) Establishing the base state for the mode extraction 2) Friction coupling through the contact 3) Building and running a brake squeal simulation 4) Post-processing and identifying unstable modes
Objectives	To be able to understand how to eliminate brake noise issues like Squeal & Groan.
Prerequisites	The user is required to take a training in PowerFLOW basics before beginning this course. He/she needs some knowledge of PowerDELTA.

Experience Brake Squeal Transportation and Mobility	
Available Online	Yes

Experience Cabin soak/ cool down and heat up Transportation and Mobility	
Course Code	SIM-en-CCFT-A-V30R2022
Available Release	SIMULIA 2022
Duration	2.92 hours
Course Material	
Level	Advanced
Audience	Basic familiarity with CFD, PowerFLOW, PowerTHERM, Cabin Comfort Soak Workflow
Description	At the end of the course, the user will be able to understand the basics of climate control cooldown simulation, create geometry for climate control simulations, set up the PowerTHERM and PowerCASE files for various modes of HVAC, and postprocess and analyze the cooldown results.
Objectives	Upon completion of this course, you will be able to: - 1. Understand several workflows covering cooldown and HVAC noise - 2. Prepare PowerTHERM geometry for thermal simulation - 3. Set up PowerTHERM model - 4. Couple PowerTHERM to PowerFLOW - 5. Run Transient Coupled Simulation and Post-Process thermal results
Prerequisites	Basic familiarity with CFD, PowerFLOW, PowerTHERM, Cabin Comfort Soak Workflow
Available Online	Yes

Experience Comfort Analysis for Transportation and Mobility	
Course Code	SIM-en-RVD-A-V30R2022
Available Release	SIMULIA 2022
Duration	1 hours
Course Material	
Level	Advanced
Audience	- Rail vehicle dynamics engineers and analysts - [Roles] - Simpack Contact - Simpack FlexTrack - Simpack Post - Simpack Pre - Simpack Rail - Simpack Rail Wear - All Physics Analyst
Description	The course introduces a process to develop, optimize and virtually validate the dynamics performance attributes for rail vehicles in terms of passenger comfort, durability, and passenger safety. In this lecture, you will be introduced to one of the workflows of rail vehicle dynamics called comfort analysis, which is part of the experience of this industrial process.
Objectives	The purpose of this course is to develop and virtually validate the performance attributes of vehicle dynamics in terms of derailment risk assessment.
Prerequisites	Simpack Rail
Available Online	Yes

Experience Crankshaft and Connecting Rod strength, stiffness and durability Transportation and Mobility	
Course Code	SIM-en-CCMDA-A-V30R2022
Available Release	SIMULIA 2022
Duration	3 hours
Course Material	
Level	Advanced
Audience	- Powertrain Mechanical (Structural) Analysts - [Roles] - Multidisciplinary Optimization Engineer - Structural Performance Engineer - Structural Analysis Engineer
Description	Please contact the training team (simulia@3ds.com) to download the required workshop files. This course covers the workflow for multi-body dynamics (MBD) and durability analysis of the engine crank-train. The purpose of MBD and durability analysis is to understand the fatigue performance of the crankshaft and the connecting rod under dynamic loading as experienced by the crank-train during operating conditions. The understanding gained from this simulation would ultimately lead to improved durability of the engine system. The user will be introduced to the basics of creating an MBD and durability crank-train simulation. The user will learn how to execute the workflow through an exercise with a step-by-step procedure for building and running the simulation. Topics introduced include: 1) Multi-body dynamic crank-train modeling 2) Reduced flexible body representation of components 3) Fatigue analysis using results from multi-body dynamic simulation
Objectives	Realistic loads prediction on engine components

Experience Crankshaft and Connecting Rod strength, stiffness and durability Transportation and Mobility	
	- Deformation and stress field prediction in engine components because of the loads - Durability assessment from the stress field prediction to get Fatigue safety factors
Prerequisites	
Available Online	Yes

Experience Critical Speed Analysis Transportation and Mobility	
Course Code	SIM-en-CSATM-A-V30R2022
Available Release	SIMULIA 2022
Duration	1 hours
Course Material	
Level	Advanced
Audience	- Rail vehicle dynamics engineers and analysts - [Roles] - Simpack Contact - Simpack FlexTrack - Simpack Post - Simpack Pre - Simpack Rail - Simpack Rail Wear - All Physics Analyst
Description	The Critical Speed workflow estimates the maximum vehicle speed for stable operation using a linear and a nonlinear approach.
Objectives	The purpose of this course is to develop and virtually validate the performance attributes of vehicle dynamics in terms of derailment risk assessment.
Prerequisites	Simpack Rail
Available Online	Yes

Experience Derailment Analysis Transportation and Mobility	
Course Code	SIM-en-DEATM-A-V30R2022
Available Release	SIMULIA 2022
Duration	0.75 hours
Course Material	
Level	Advanced
Audience	Rail vehicle dynamics engineers and analysts
Description	The Rail Vehicle Dynamics IPE introduces a process to develop, optimize and virtually validate the dynamics performance attributes for rail vehicles in terms of passenger comfort, durability and passenger safety.
Objectives	The purpose of this course is to develop and virtually validate the performance attributes of vehicle dynamics in terms of derailment risk assessment.
Prerequisites	Simpack Rail
Available Online	Yes

Experience Driveability Transportation and Mobility	
Course Code	SIM-en-DRTM-A-V30R2022
Available Release	SIMULIA 2022
Duration	1.50 hours
Course Material	
Level	Advanced
Audience	- Vehicle Dynamics Engineers and Analysts - (Multi Body Simulation)
Description	This workflow focuses on the longitudinal dynamics of the vehicle. The user will get familiar with the common maneuvers used for assessment of the gear shift behavior, the acceleration of the passengers during the gear shift, chassis pitch angle, and others.
Objectives	Develop and virtually validate vehicle dynamics performance in attributes of handling performance, ride comfort, durability, noise vibration and harshness, software in the loop, and driveability.
Prerequisites	Experience Introduction to Vehicle Dynamics Performance Transportation & Mobility
Available Online	Yes

Experience Durability Transportation and Mobility	
Course Code	SIM-en-DUTM-A-V30R2022
Available Release	SIMULIA 2022
Duration	1.67 hours
Course Material	
Level	Advanced
Audience	- Vehicle Dynamics Engineers and Analysts (Multi Body Simulation) - [Roles] - Simpack User - Simpack Wizard - All Physics Analyst
Description	The durability workflow focuses on the forces and dynamic load of the components, flexible body integration, stress results postprocessing, and fatigue results postprocessing.
Objectives	Develop and virtually validate vehicle dynamics performance in attributes of handling performance, ride comfort, durability, noise vibration and harshness, software in the loop, and driveability.
Prerequisites	Experience Introduction to Vehicle Dynamics Performance Transportation & Mobility
Available Online	Yes

Experience Engine Sealing and Bore Distortion Analysis Transportation and Mobility	
Course Code	SIM-en-ESBD-A-V30R2022
Available Release	SIMULIA 2022
Duration	4 hours
Course Material	
Level	Advanced
Audience	- Powertrain Mechanical (Structural) Analysts - [Roles] - Multidisciplinary Optimization Engineer - Structural Performance Engineer - Structural Analysis Engineer
Description	The course covers the workflow for engine sealing and bore distortion analysis, which is carried out for internal combustion engines. The purpose of engine sealing and bore distortion analysis is to ensure the engine is designed such that mating surfaces remain sealed under operational loading conditions and that cylinder bore distortion is minimized. The cylinder head, cylinder head gasket, engine block, cylinder liners, crankshaft main bearing caps, and relevant bolts are included in the analysis. Assembly of the engine at room temperature is simulated. Additionally, the operating temperature of the engine is applied. Finally, combustion pressure is applied to simulate the firing loads in the engine. For each of these situations, leakage risk is assessed. Bore distortion must be minimized to maximize fuel efficiency, maximize engine performance, minimize engine emissions, minimize oil consumption, and have acceptable NVH performance. The user will be introduced to the basics of creating a suitable finite element model for engine sealing and bore distortion analysis. The user will learn how to execute the workflow through a workshop with

Experience Engine Sealing and Bore Distortion Analysis Transportation and Mobility	
	a step-by-step procedure for building and running the simulation. Topics introduced include: 1) Model abstraction, 2) Modeling and meshing, 3) Scenario definition, 4) Simulation run, and 5) Post-processing.
Objectives	Accurate prediction of deformation and stresses of the engine block, cylinder head, cylinder liners, and main crankshaft bearings under assembly loads, operational loading, and temperatures - prediction of sealing pressure of cylinder head gasket, which is used to assess leakage risk - prediction of the distortion of the cylinder liners to assess leakage risk at the piston rings
Prerequisites	1) Mechanical Scenario Creation Essentials 2) Physics Results Explorer Essentials 3) Structural Model Creation Essentials
Available Online	Yes

Experience Flexible track and bridges Transportation and Mobility	
Course Code	SIM-en-FTBTM-A-V30R2022
Available Release	SIMULIA 2022
Duration	1.17 hours
Course Material	
Level	Advanced
Audience	- Rail vehicle dynamics engineers and analysts - [Roles] - Simpack Contact - Simpack FlexTrack - Simpack Post - Simpack Pre - Simpack Rail - Simpack Rail Wear - All Physics Analyst
Description	The Flexible Track workflow evaluates track deformation and possible resonance of the track with natural frequencies using the linear FlexTrack approach.
Objectives	The purpose of this course is to develop and virtually validate the performance attributes of vehicle dynamics in terms of derailment risk assessment.
Prerequisites	Simpack Rail
Available Online	Yes

Experience Handling Transportation and Mobility	
Course Code	SIM-en-HATM-A-V30R2022
Available Release	SIMULIA 2022
Duration	1.33 hours
Course Material	
Level	Advanced
Audience	- Vehicle Dynamics Engineers and Analysts - (Multi Body Simulation)
Description	This workflow covers the driver's and designer's perceptions of handling analysis. In addition, all the available handling load cases are presented, which can be separated into closed and open loops. The files necessary to complete the workshops can be downloaded from the last module in this section.
Objectives	To be able to understand the handling of a vehicle, which can be interpreted in different ways depending on the perspective.
Prerequisites	Experience Introduction to Vehicle Dynamics Performance Transportation & Mobility
Available Online	Yes

Experience HVAC Noise Transportation and Mobility	
Course Code	SIM-en-HVNTM-A-V30R2022
Available Release	SIMULIA 2022
Duration	2 hours
Course Material	
Level	Advanced
Audience	CFD Analysts and Climate Control HVAC Designers
Description	This course introduces you to the HVAC Noise of Cabin Comfort IPE. You will learn the following: Introduction, Geometry Preparation with PowerDELTA, Case Setup, Running Simulations, and Postprocessing.
Objectives	Upon completion of this course, you will be able to: - Understand Cabin Comprot IPE of HVAC Noise - Learn the use of HVAC Noise Template Suite - Prepare an example of HVAC geometry - Generate example of HVAC noise case - Submit acoustic postprocessing jobs and analysis results
Prerequisites	Basic familiarity with CFD, PowerFLOW, PowerTHERM, and Cabin Comfort Soak Workflow
Available Online	Yes

Experience Introduction to Vehicle Dynamics Performance Transportation and Mobility	
Course Code	SIM-en-VDPI-A-V30R2022
Available Release	SIMULIA 2022
Duration	1.33 hours
Course Material	
Level	Advanced
Audience	- Vehicle Dynamics Engineers and Analysts - (Multi Body Simulation)
Description	The topics covered include Overview of Vehicle Dynamics, Simpack Wizard, and Simpack Wizard Automotive database. The files necessary to complete the workshops can be downloaded from the last module in this section.
Objectives	To be able to develop, optimize and virtually validate the vehicle dynamics performance of cars, trucks, or bikes using SIMULIA Simpack Multibody Simulation (MBS) technology.
Prerequisites	
Available Online	Yes

Experience Joint Analysis Transportation and Mobility	
Course Code	SIM-en-JOATM-A-V30R2022
Available Release	SIMULIA 2022
Duration	3.50 hours
Course Material	
Level	Advanced
Audience	- Suspension chassis CAE engineers, suspension designers, package designers, and material engineers - [Roles] - Function Driven Generative Designer - Multidisciplinary Optimization Engineer - Structural Performance Engineer - Structural Generative Designer - Structural Analysis Engineer
Description	This lecture covers the Joint Analysis section of Chassis & Suspension Strength and Durability IPE. The material model for the main material of a joint uses the calibration result from the first lecture, I. (Material Calibration.) You can refer to the first lecture for the details of that material model and parameters.
Objectives	The main purpose of this course is to enable you to; - 1. Understand the rubber bushing modeling - 2. Understand joint stiffness optimization workflow by using Isight and Abaqus - 3. Understand rubber fatigue optimization workflow by using Tosca, Abaqus, and fe-safe/Rubber
Prerequisites	- Fundamentals (basic functionalities and user interface) of Suspension terminologies, Simpack Wizard, Simpack Post, Isight Design Gateway, and - Isight Runtime Gateway.

Experience Joint Analysis Transportation and Mobility	
Available Online	Yes

Experience Kinematics and Compliance Analysis Transportation and Mobility	
Course Code	SIM-en-CSSD-A-V30R2022
Available Release	SIMULIA 2022
Duration	2.50 hours
Course Material	
Level	Advanced
Audience	Suspension chassis CAE engineers, suspension designers, package designers, and material engineers
Description	This course covers several workflows for Chassis and Suspension Strength & Durability. The user will learn the requirements and recommendations for executing the simulation process, and better understanding the results. This course outlines the process used for performing Kinematics and Compliance (K&C) analysis and suspension optimization using Simpack and Isight.
Objectives	Objectives are optimizing multi-objectives, finding a tradeoff for the components against functional performance, reliability, and user experience. The tradeoff between manufacturing cost, available space, and performance requirements is also one of the objectives. - Other objectives for this course are to reduce weight and improve production, reduce time to market, and minimize the risk of warranty.
Prerequisites	- Fundamentals (basic functionalities and user interface) of Suspension terminologies, Simpack Wizard, Simpack Post, Isight Design Gateway, and - Isight Runtime Gateway.
Available Online	Yes

Experience Material Calibration Transportation and Mobility	
Course Code	SIM-en-MACTM-A-V30R2022
Available Release	SIMULIA 2022
Duration	3 hours
Course Material	
Level	Advanced
Audience	- Suspension chassis CAE engineers, suspension designers, package designers, and material engineers - [Roles] - Function Driven Generative Designer - Multidisciplinary Optimization Engineer - Structural Performance Engineer - Structural Generative Designer - Structural Analysis Engineer
Description	This course covers the Material Calibration section of Chassis & Suspension Strength and Durability IPE. This course has five Lectures and three workshops. You can download the required workshop data by clicking the resource button at the upper right corner in the workshop section.
Objectives	Objectives are optimizing multi-objectives, finding a tradeoff for the components against functional performance, reliability, and user experience. The tradeoff between manufacturing cost, available space, and performance requirements is also one of the objectives. - Other objectives for this course are to reduce weight and improve production, reduce time to market, and minimize the risk of warranty.

Experience Material Calibration Transportation and Mobility	
Prerequisites	- Fundamentals (basic functionalities and user interface) of Suspension terminologies, Simpack Wizard, Simpack Post, Isight Design Gateway, and - Isight Runtime Gateway.
Available Online	Yes

Experience NVH Transportation and Mobility	
Course Code	SIM-en-NVHTM-A-V30R2022
Available Release	SIMULIA 2022
Duration	1 hours
Course Material	
Level	Advanced
Audience	- Vehicle Dynamics Engineers and Analysts - (Multi Body Simulation) - [Roles] - Simpack User - Simpack Wizard - All Physics Analyst
Description	This workflow covers the drover's and designer's perception of Noise, Vibration, and Harshness (NVH). In addition, the Roller Test Rig loadcase is described, which is used for the run-up analysis. The files necessary to complete the workshops can be downloaded from the last module in this section. To be able to understand the handling of a vehicle, which can be interpreted in different ways depending on the perspective.
Objectives	To be able to understand various evaluation methods of NVH depending on recognition, such as driver's viewpoint and designer's viewpoint.
Prerequisites	Experience Introduction to Vehicle Dynamics Performance Transportation & Mobility
Available Online	Yes

Experience Ride Transportation and Mobility	
Course Code	SIM-en-RUTM-A-V30R2022
Available Release	SIMULIA 2022
Duration	1.42 hours
Course Material	
Level	Advanced
Audience	- Vehicle Dynamics Engineers and Analysts - (Multi Body Simulation)
Description	This workflow covers the driver's and designer's perceptions of ride analysis. In addition, an overview of the rough surface and hydropuls loadcases is presented. The files necessary to complete the workshops can be downloaded from the last module in this section.
Objectives	To be able to understand the ride of a vehicle, which can be interpreted in different ways depending on the perspective.
Prerequisites	Experience Introduction to Vehicle Dynamics Performance Transportation & Mobility
Available Online	Yes

Experience Soak and Heat Retention Transportation and Mobility	
Course Code	SIM-en-PTM-A-V30R2022
Available Release	SIMULIA 2022
Duration	4.50 hours
Course Material	
Level	Advanced
Audience	- CFD analysts and thermal engineers - - [Roles] - Fluid Dynamics Engineer - PowerFLOW Thermal - All Physics Analyst - Thermal Systems Engineer
Description	In the Workshop section, click Resources in the upper right to download the workshop files you need for workshops. This course introduces you to Powertrain Thermal Management IPE, Propulsion Soak Heat Retention course. You will learn the following. 1. Introduction 2. PowerTHERM geometry preparation with PowerDELTA 3. Steady-state TDF file setup with PowerTHERM 4. Coupling setup of PowerFLOW and PowerTHERM case file 5. How to run steady state coupled simulation 6. Post-processing thermal results with PowerTHERM
Objectives	Upon completion of this course you will be able to: - Prepare PowerTHERM geometry for thermal simulation - Set up PowerTHERM model - Couple PowerTHERM to PowerFLOW - Run Coupled Simulation and Post-Process thermal results

Experience Soak and Heat Retention Transportation and Mobility	
Prerequisites	User is required to take a training in PowerFLOW basics before beginning this course. He/she needs some knowledge of PowerTHERM and PowerDELTA.
Available Online	Yes

Experience Software In the Loop (SIL) Transportation and Mobility	
Course Code	SIM-en-SILTM-A-V30R2022
Available Release	SIMULIA 2022
Duration	3.50 hours
Course Material	
Level	Advanced
Audience	- Vehicle Dynamics Engineers and Analysts - (Multi Body Simulation)
Description	This workflow presents an overview of the available Simpack Interfaces. The predominant ones are the MATLAB®/Simulink® interfaces and the Functional Mock-up interfaces. The files necessary to complete the workshops can be downloaded from the last module in this section.
Objectives	To be able to understand the general overview of the Simpack Interfaces, such as The SIMAT S-Function Export, the state-Space Matrices, SIMAT co-simulation, MatSIM, MATLAB Result Export, and Simpack FMU Import and Export.
Prerequisites	Experience Introduction to Vehicle Dynamics Performance Transportation & Mobility
Available Online	Yes

Experience Thermal Protection Transportation and Mobility	
Course Code	SIM-en-THPTM-A-V30R2022
Available Release	SIMULIA 2022
Duration	4.50 hours
Course Material	
Level	Advanced
Audience	CFD analysts and thermal engineers
Description	This course outlines the process used to perform a thermal protection simulation using PowerFLOW. You will learn Introduction, PowerTHERM geometry preparation with PowerDELTA, Steady-state TDF file setup with PowerTHERM, Coupling setup of PowerFLOW and PowerTHERM case file, How to run steady state coupled simulation, Post-processing thermal results with PowerTHERM.
Objectives	Upon completion of this course, you will be able to prepare PowerTHERM geometry for thermal simulation, set up PowerTHERM model, couple PowerTHERM to PowerFLOW, run coupled simulation, and postprocess thermal results.
Prerequisites	User is required to take a training in PowerFLOW basics before beginning this course. He/she needs some knowledge of PowerTHERM and PowerDELTA.
Available Online	Yes

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