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Course Catalog

Learning Experience for SIMULIA

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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 Electromagnetics - SMEMGLX-OC

CST Studio Suite - Antenna Placement	
Course Code	SIM-en-CSTAPL-A-V30R2024
Available Releases	SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	6.58 hours
Course Material	
Level	Advanced
Audience	Electromagnetic Simulation Analysts and Antenna Designers
Description	Throughout this course, you will become familiar with topics like antenna placement, antenna-to-antenna coupling, antenna matching network and radiation hazard. Particular attention is given to the generation and usage of near/far-field sources in the context of the Hybrid Solver Task.
Objectives	Upon completion of this course you will be able to: - Use the Integral Equation and Asymptotic Solvers. - Use the Hybrid Solver to perform Antenna Placement analysis.
Prerequisites	Introduction to CST Studio Suite and CST Microwave & Antenna
Available Online	Yes

CST Studio Suite - Charged Particle Dynamics	
Course Code	SIM-en-CSTCPD-A-V30R2024
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	5.83 hours
Course Material	
Level	Advanced
Audience	Particle Dynamics Simulation Analysts
Description	Throughout this course you will become familiar with the use of the Charged Particle Module. You will be able to use and run the different solvers available within the CST Studio Suite environment. This training course is well suited for the design of vacuum electronic devices, the accelerator community and any applications taking into account the propagation of a charged particle beam under vacuum or a dispersive media like a plasma. The Multipactor analysis is also one of the capabilities of this tool.
Objectives	Upon completion of this course you will be able to analyze electromagnetic devices which interact with charged particles. You will: - Understand how to define a particle source and apply the available emission models to it. - Load Different types of precalculated fields for the particle simulation. - Use the different postprocessing capabilities to read out fields and particle result data. - Use and run the tracking and the PIC solver. - Be familiar with the Wakefield analysis for accelerator components. - Characterize material properties such as the secondary electron emission.

CST Studio Suite - Charged Particle Dynamics	
Prerequisites	Introduction to CST Studio Suite
Available Online	Yes

CST Studio Suite - EDA / SI-PI	
Course Code	SIM-en-CSTEDA-A-V30R2022
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022
Duration	8 hours
Course Material	
Level	Advanced
Audience	PCB layout engineers and SI/PI/EMC simulation analysts
Description	This course describes and demonstrates how to use CST for Signal Integrity/high speeds technology. The course will go over some fundamentals of how to set-up and run an electromagnetic simulation - it will take the viewpoint of how to do this for electronics applications and spends a good amount of time on features and tools that are helpful and specific for this area.
Objectives	Upon completion of the course you will: - Be able to perform basic functions in terms of modeling, setup of simulation, importing layout boards and analyzing pre- and postprocessing results - Get an overview on suitable solvers for specific SI/ PI applications. - Know how to set up and run the solvers and tools for different SI and PI
Prerequisites	None (basic knowledge of SI, PI and EMC analysis)
Available Online	Yes

CST Studio Suite - EMC/EMI	
Course Code	SIM-en-CSTEMC-A-V30R2024
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	7.50 hours
Course Material	
Level	Advanced
Audience	This course is intended for engineers involved in electromagnetic compatibility (EMC), electromagnetic interference (EMI), electrostatic discharge (ESD), electromagnetic environmental effects (E3) and antenna integration.
Description	This course covers the EMC Module providing an overview on how simulation can be applied towards electromagnetic compatibility (EMC) design and analysis for emissions and immunity, conducted and radiated.
Objectives	The EMC Module expands upon the CORE Module basics to provide an overview on how simulation can be applied towards electromagnetic compatibility (EMC) design and analysis. Upon completion, you will understand the different solvers, sources and outputs for EMC simulation, and you will be able to set up simulations for emissions and immunity, shielding effectiveness, 3D EM and circuit co-simulations, and cable modeling.
Prerequisites	Introduction to CST Studio Suite
Available Online	Yes

CST Studio Suite - Low Frequency	
Course Code	SIM-en-CSTLFS-A-V30R2023
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	8.25 hours
Course Material	
Level	Advanced
Audience	Low Frequency Electromagnetic Simulation Analysts
Description	This course aims to improve users' experience with the tools in CST Studio Suite dedicated to electromagnetic simulation of low-frequency and static applications. After a short overview of the basic usage of CST Studio Suite, the course focuses on the various available sources and solvers in CST EM Studio.
Objectives	This course aims to improve the users' experience with the tools in CST Studio Suite dedicated to electromagnetic simulation of low-frequency and static applications. After a short overview of the basic usage of CST Studio Suite, the course focuses on the various available sources and solvers. Workshop exercises provide an opportunity for hands-on experience with low frequency electromagnetic simulation.
Prerequisites	None
Available Online	Yes

CST Studio Suite - Microwave and Antenna	
Course Code	SIM-en-CSTMWA-A-V30R2024
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	6.33 hours
Course Material	
Level	Advanced
Audience	Electromagnetic Simulation Analysts and Antenna Designers
Description	Throughout this course you will become familiar with the high frequency solvers used to simulate different type of antennas. This course will also discuss more specific topics like antenna matching network and SAR calculations in the human body.
Objectives	Upon completion of this course you will be able to: - Construct and simulate antennas using different solvers. - Visualize and extract primary results (S-Parameters, Nearfield distribution, Farfield) as well as more advanced results using postprocessing (i.e. Potential Bandwidth, SAR). - Handle imported CAD models. - Design simple matching network. - Use the Hybrid Solver to simulate more complex RF Systems.
Prerequisites	Introduction to CST Studio Suite
Available Online	Yes

CST Studio Suite - Multiphysics	
Course Code	SIM-en-CSTMPS-A-V30R2023
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2023
Duration	7.83 hours
Course Material	
Level	Advanced
Audience	Recommended for Electromagnetic Simulation Analysts who also need thermal and mechanical analysis as part of their workflow
Description	This course describes how to use CST's Multiphysics Studio to perform thermal and mechanical analysis. The course reviews the basic concepts of heat transfer and mechanical behaviors of materials, then explains the sources, boundary conditions, meshing and solver options available in MPS, and illustrates the steps of an EM-Thermal-Mechanical coupled simulation.
Objectives	Upon completion of the course you will: - - Understand basic thermal and mechanical theories - - Get an overview of CST's Multiphysics Studio's capabilities - - Understand basic sources, boundary conditions, meshing options and solver options in CST Multiphysics Studio - - Be able to run an EM-Thermal-Mechanical coupled analysis
Prerequisites	Introduction to CST Studio Suite
Available Online	Yes

CST Studio Suite - Spark3D	
Course Code	SIM-en-CSTSP3-A-V30R2022
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022
Duration	6 hours
Course Material	
Level	Advanced
Audience	Electromagnetic Simulation Analysts
Description	Throughout this course you will become familiar with the Spark3D interface and how to perform basic functions in terms of modeling, setup of simulation, and analyzing pre-/post-processing results. This course also provides a general introduction to Multipactor and Corona discharge effects.
Objectives	Upon completion of the course you will be able to: - - • Understand basic modeling and simulation setup within Spark3D - • Analyze Spark3D results - • Understand general aspects of Multipactor and Corona discharge effects
Prerequisites	Basic knowledge of electromagnetic simulation software like CST Studio Suite
Available Online	Yes

Introduction to CST Studio Suite	
Course Code	SIM-en-CSTCOR-F-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	8.42 hours
Course Material	
Level	Fundamental
Audience	Electromagnetic Simulation Analysts
Description	Throughout this course you will become familiar with the CST Studio Suite interface and how to perform basic tasks in terms of modeling, setup of simulation, and analyzing pre and postprocessing results. This course will also briefly discuss the various high frequency solvers available in CST Microwave Studio and provide a behind-the-scenes look at the FIT and FEM algorithms.
Objectives	Upon completion of this course you will be able to: - Navigate the general layout of the CST Studio interface - Generate CAD geometries within the native modeling interface - Set up the project environment with the desired units, frequency settings, background materials and boundary conditions - Understand the various material types that exist and how to define them - Setup excitations using lumped elements and waveguide ports - Setup result monitors to obtain 2D/3D field data - Choose and set up the most appropriate solver and algorithm for high frequency applications.

Introduction to CST Studio Suite	
	- Run Time-Domain (FIT) and Frequency-Domain (FEM) simulations including parametric sweeps and optimizations. - Analyze simulation results such as S-parameters, voltages, currents, 3D nearfields and farfields. - Extract data from the standard result set through the use of post-processing templates
Prerequisites	None
Available Online	Yes

Introduction to Isight	
Course Code	SIM-en-ISGT-F-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	12.67 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 Opera-2d	
Course Code	SIM-en-OPINT2-F-V30R2024
Available Releases	SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	8.25 hours
Course Material	
Level	Fundamental
Audience	Electromagnetic Simulation Engineers
Description	Throughout this course you will become familiar with the Opera-2d interface and scripting language, and learn how to perform basic functions in terms of modeling, meshing, configuring, solving, and displaying the results.
Objectives	The course includes: - Introduction to Opera-2d pre and post-processing - Introduction to Electromagnetics and FE Analysis - Advanced GUI Features (Parametrized models, Scripting) - Introduction to Opera-2d solvers - Multiple hands-on sessions using typical models or your own device
Prerequisites	None
Available Online	Yes

Introduction to Opera-3d	
Course Code	SIM-en-OPINT3-F-V30R2024
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	19.17 hours
Course Material	
Level	Fundamental
Audience	Electromagnetic Simulation Engineers
Description	This three-day course covers all main aspects of the finite element modelling process for electromagnetic devices within Opera-3d, and is aimed at providing sufficient information and hands-on experience to put you on track to successfully analyze your own devices.
Objectives	Throughout this course you will become familiar with the Opera-3d interface and how to perform basic functions in terms of modeling, meshing, configuring, solving, and displaying the results.
Prerequisites	None
Available Online	Yes

Isight Component Development	
Course Code	SIM-en-ISCD-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	13.25 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

Magnetic Signatures with Opera-3d	
Course Code	SIM-en-OPSIG-A-V30R2024
Available Releases	SIMULIA 2023 , SIMULIA 2024
Duration	12.42 hours
Course Material	
Level	Advanced
Audience	Electromagnetic Simulation Engineers primarily in ship building and defense industries
Description	Throughout this course we will teach engineers how to use Opera-3d as a tool to analyze electric and magnetic ship signatures and design coil systems for signature mitigation. The course addresses the topics of induced magnetic signatures, permanent magnetic signatures and cathodic protection which act as main sources of the signatures.
Objectives	Upon completion of the course you will be familiar with: - Induced magnetic signatures - Static signature due to deflection of the earth's magnetic field by large ferrous objects - Dynamic (eddy current) signature due to movement of the vessel in the Earth's field - Permanent magnetic signatures - Caused by remnant field in the structure - Cathodic protection systems and resulting electric and magnetic signatures - Designed to fight corrosion but contribute to the vessel's signature
Prerequisites	Introduction to Opera-3d course
Available Online	Yes

Magnet Simulation with Opera	
Course Code	SIM-en-OPMAG-A-V30R2024
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	8.33 hours
Course Material	
Level	Advanced
Audience	Electromagnetic Simulation Engineers
Description	This two day course covers Opera's capabilities for designing and simulating magnet technology applications, typically for MRI and NMR magnet systems, particle accelerator magnets, electron beam lithography and microscopy, spectroscopy, ion implanters and others. Throughout this advanced course you will extend your knowledge of simulations using Opera, both 2d and 3d, to modeling of magnets in various applications and postprocessing of the results.
Objectives	Throughout this advanced course you will extend your knowledge of simulations using Opera, both 2d and 3d, to modeling of magnets in various applications and postprocessing of the results.
Prerequisites	Introduction to Opera-3d
Available Online	Yes

Multiphysics Analysis with Opera-3d	
Course Code	SIM-en-OPMPA-A-V30R2024
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2024
Duration	10.25 hours
Course Material	
Level	Advanced
Audience	Electromagnetic Simulation Engineers
Description	This two-day course covers Opera's capabilities for coupling electromagnetics, thermal and stress analyses to solve multiphysics problems. Lectures and practical sessions are designed to give you both theoretical background and hands-on experience in modelling various multiphysics scenarios.
Objectives	Throughout this course you will become familiar with multiphysics simulations in Opera-3d using both automatic data transfer and chaining several simulations using table files.
Prerequisites	- Introduction to Opera 3D - Or an understanding of the Opera-3D interface
Available Online	Yes

Optimizing Engineering Methods with Isight	
Course Code	SIM-en-ISOM-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	12.25 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

Optimizing Engineering Methods with Isight	
Available Online	Yes

Superconducting Quench Analysis with Opera	
Course Code	SIM-en-OPSQA-A-V30R2024
Available Releases	SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	6.42 hours
Course Material	
Level	Advanced
Audience	Electromagnetic Simulation Engineers
Description	The SIMULIA Opera Quench solvers are designed specifically for quench modelling of superconducting coils as the coils become resistive. This course will introduce quench and superconductivity technology. The Opera Quench Thermal and Quench Multiphysics solvers, the material data and analysis options will be covered.
Objectives	Upon completion of this course you will be able to: - Understand the physical requirements to prepare simulations using Opera - Appreciate the range of superconducting technologies which can be simulated - Differentiate between the Quench Thermal and Quench Multiphysics solvers - Run and post-process quench analyses with Opera
Prerequisites	- Before undertaking this course, you should have basic knowledge of superconductivity. - The following course is strongly recommended prior to taking this one: Introduction to Opera-3d
Available Online	Yes

Uncertainty Quantification with Isight	
Course Code	SIM-en-ISUQ-A-V30R2024
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	8.33 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

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 Fluids - SMFLLX-OC

Complete Guide to PowerDELTA	
Course Code	SIM-en-PDCOMP-F-V30R2022
Available Releases	SIMULIA 2021 , SIMULIA 2022
Duration	29.67 hours
Course Material	
Level	Fundamental
Audience	New PowerDELTA users and CFD Analysts
Description	This course describes the set of tools provided by PowerDELTA to edit CAD/Mesh data, in order to obtain watertight meshes as required by PowerFLOW. Each tool is explained within the context of the recommended geometry preparation process.
Objectives	Upon completion of this course you will be able to: - Understand basic geometry preparation requirements for PowerFLOW simulation. - Create and prepare watertight geometry using the tools available in PowerDELTA. - Analyze, identify, and correct mesh issues to produce high quality PowerFLOW meshes.
Prerequisites	Basic familiarity with CAD concepts and CFD
Available Online	Yes

Introduction to Isight	
Course Code	SIM-en-ISGT-F-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	12.67 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 PowerACOUSTICS	
Course Code	SIM-en-PAINT-F-V30R2022
Available Release	SIMULIA 2022
Duration	2.92 hours
Course Material	
Level	Fundamental
Audience	Acoustics Analysts
Description	
Objectives	Upon completion of this course you will be able to: - Understand basic PowerACOUSTICS concepts - Understand how to evaluate noise quality - Understand how to assess noise design performances - Understand how to identify the origin of noise sources
Prerequisites	Basic familiarity with PowerFLOW
Available Online	Yes

Introduction to PowerDELTA	
Course Code	SIM-en-PDINT-F-V30R2022
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022
Duration	14.50 hours
Course Material	
Level	Fundamental
Audience	- CFD Analysist - CFD Modeler
Description	This two-day introductory class is intended for new users of PowerDELTA. This course is intended to complement the Introduction to PowerFLOW seminar, which describes how to perform CFD analyses with PowerFLOW.
Objectives	Upon completion of this course you will be able to: - Understand basic geometry preparation requirements for PowerFLOW simulation. - Create geometry for aerodynamics analysis simulation. - Analyze, identify, and correct mesh issues to produce high quality PowerFLOW meshes. - Efficiently prepare watertight geometry using the available editing tools.
Prerequisites	This course is recommended for new PowerDELTA users. Some familiarity with interactive preprocessors is helpful but not required. Basic familiarity with CFD is recommended.
Available Online	Yes

Introduction to PowerFLOW	
Course Code	SIM-en-PFINT-F-V30R2022
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022
Duration	11.75 hours
Course Material	
Level	Fundamental
Audience	CFD Analysts
Description	This course is intended for new users of PowerFLOW or those who have recently started using PowerCASE® and PowerVIZ®. Simplified external aerodynamics flow around a passenger vehicle is used to explain key concepts, although sufficient information is provided to enable you to perform routine PowerFLOW simulations for any application.
Objectives	Upon completion of this course you will be able to: - Understand basic PowerFLOW concepts. - Generate a basic PowerFLOW aerodynamics simulation case. - Postprocess and analyze PowerFLOW results to understand basic aerodynamics application. - Understand basic geometry creation requirements for PowerFLOW simulation. - Understand basic Lattice Boltzmann Method theory.
Prerequisites	Basic familiarity with CFD
Available Online	Yes

Introduction to PowerTHERM	
Course Code	SIM-en-PTINT-F-V30R2022
Available Release	SIMULIA 2022
Duration	4 hours
Course Material	
Level	Fundamental
Audience	Thermal Analysts
Description	PowerTHERM® is a digital thermal management solution that has been extensively validated. This course is intended for users interested in running PowerFLOW® and PowerTHERM® coupled simulations. The software allows users to predict surface temperatures and heat fluxes generated by heat radiation, conduction, and convection.
Objectives	Upon completion of this course you will be able to: - Understand basic PowerTHERM concepts - Understand how to predict surface temperatures - Understand how to identify problem areas and provide recommendations to improve the design - Understand how to use PowerTHERM to quickly make design changes to baseline and evaluate thermal performance improvements
Prerequisites	Basic familiarity with PowerFLOW
Available Online	Yes

Introduction to Tosca Fluid	
Course Code	SIM-en-TOSCFL-F-V30R2021
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021
Duration	9.17 hours
Course Material	
Level	Fundamental
Audience	CFD Analysts working with STAR-CD or ANSYS Fluent
Description	This course is a comprehensive introduction to the fluid optimization capabilities of Tosca Fluid. Attendees will learn how to define and solve basic topology optimization tasks for internal flow problems, submit optimization jobs, and view and evaluate the results.
Objectives	Upon completion of this course you will be able to: - Solve fundamental topology optimization problems for internal flow applications - Postprocess results and perform surface smoothing - Follow-up and transfer results into the CAEenvironment
Prerequisites	Basic familiarity with CFD
Available Online	Yes

Introduction to XFlow	
Course Code	SIM-en-XFINT-F-V30R2022
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022
Duration	8 hours
Course Material	
Level	Fundamental
Audience	Engineers with knowledge or experience in CFD
Description	This course introduces the XFlow Graphical User Interface (GUI), and shows how to run a simulation
Objectives	Upon completion of this course you will be able to: - Get started with the XFlow GUI - Set up a single phase simulation in XFlow - Post-process simulations in XFlow - Learn how to use the different lattice refinement schemes
Prerequisites	None
Available Online	Yes

Isight Component Development	
Course Code	SIM-en-ISCD-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	13.25 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-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	12.25 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

Optimizing Engineering Methods with Isight	
Available Online	Yes

Uncertainty Quantification with Isight	
Course Code	SIM-en-ISUQ-A-V30R2024
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	8.33 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

XFlow Advanced	
Course Code	SIM-en-XFADV-A-V30R2022
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022
Duration	16 hours
Course Material	
Level	Advanced
Audience	Engineers with knowledge or experience in CFD
Description	This course introduces the advanced features and scripting capabilities of XFlow
Objectives	Upon completion of this course you will be able to: - Understand the Lattice-Boltzmann Method used in XFlow - Use the different features available for all XFlow solvers: Single Phase, Free surface and Multiphase solvers - Set up internal and external simulations using all the solvers of XFlow - Set up thermal and acoustics analysis in XFlow - Set up simulations in XFlow with different moving parts behaviors - Handle all the postprocessing tools of XFlow - Use advanced features and scripting capabilities of XFlow
Prerequisites	- Before taking this course the completion of the following prequisite courses (or equivalent knowledge) is required: - XFlow Introduction - XFlow Intermediate
Available Online	Yes

XFlow Complete	
Course Code	SIM-en-XFLOW-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2024
Duration	40 hours
Course Material	
Level	Advanced
Audience	Engineers with knowledge or experience in CFD
Description	This course covers all the XFlow capabilities and how to set up, and postprocess all kind of simulations in XFlow
Objectives	Upon completion of this course you will be able to: - Understand the Lattice-Boltzmann Method used in XFlow - Use the different features available for all XFlow solvers: Single Phase, Free- surface and Multiphase solvers - Set up internal and external simulations using all the solvers of XFlow - Set up thermal and acoustics analysis in XFlow - Set up simulations in XFlow with different moving parts behaviors - Handle all the postprocessing tools of XFlow - Use advanced features and scripting capabilities of XFlow
Prerequisites	None
Available Online	Yes

XFlow Intermediate	
Course Code	SIM-en-XFMED-A-V30R2022
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022
Duration	16 hours
Course Material	
Level	Advanced
Audience	Engineers with knowledge or experience in CFD
Description	This course covers the main features and physics of XFlow.
Objectives	Upon completion of this course you will be able to: - Understand XFlow geometries behaviors and set up simulations with the Enforced and Rigid Body Dynamics geometry behavior. - Import and visualize geometries, perform geometry and healing operations - Understand and use thermal models in XFLow - Understand and use the Free Surface and Multiphase solvers available in XFlow - Postprocess thermal simulations and external and internal Multiphase simulations in XFlow
Prerequisites	- Before taking this course the completion of the following prequisite courses (or equivalent knowledge) is required: - XFlow Introduction
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] - 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 system complexity and additional demands to reduce size, cost, and development time.

Experience Device EMC/EMI Performance EMC High-Tech	
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 Multibody Systems - SMMBSLX-OC

Introduction to Isight	
Course Code	SIM-en-ISGT-F-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	12.67 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-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	19 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-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	13.25 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-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	12.25 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

Optimizing Engineering Methods with Isight	
Available Online	Yes

Simpack Automotive	
Course Code	SIM-en-SMPKAU-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	6.75 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-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	6.92 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-V30R2024
Available Releases	SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	16.75 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: - Understand Simpack engine applications - Use Simpack's specific modeling elements for engine applications The course covers the following topics: - Overview of engine applications in Simpack - Cranktrain modeling - Hydraulic lash adjuster - Dynamic spring generation tool - Kinematic and dynamic analysis of single valvetrain models - Chain drive analysis - 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-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	9.92 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 FE 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 a finite element program and Simpack
Available Online	Yes

Simpack FlexTrack	
Course Code	SIM-en-SMPKFT-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	7 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-V30R2024
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	6.17 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-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	13.83 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

Simpack Rail	
Available Online	Yes

Simpack Scripting	
Course Code	SIM-en-SMPKSC-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	5.67 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 language. - 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-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	8.33 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-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
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

Simpack Wind	
Available Online	Yes

Uncertainty Quantification with Isight	
Course Code	SIM-en-ISUQ-A-V30R2024
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	8.33 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

Learning Experience for SIMULIA Structures - SMSTRLX-OC

Abaqus/CAE: Geometry Import and Meshing	
Course Code	SIM-en-CAGIM-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	13.92 hours
Course Material	
Level	Advanced
Audience	This course is recommended for users with a basic knowledge of Abaqus/CAE who wish to become more proficient with the product.
Description	Real-world engineering commonly involves the analysis and design of complicated geometry. These types of analysis depend critically on having a modeling tool with a robust geometry import capability in conjunction with advanced, easy-to-use mesh generation algorithms. This course provides an in-depth look at several advanced Abaqus/CAE capabilities: CAD geometry import and repair, meshing and partitioning of complicated geometry. Both native and neutral geometry formats are discussed. An in-depth treatment of meshing techniques is also provided, including the use of virtual topology to ease the meshing of complicated geometry in the presence of small geometric features. The course consists of lectures, demonstrations and workshops.
Objectives	Upon completion of this course you will be able to: - Import, edit, and repair CAD geometry. - Import and edit orphan meshes. - Use virtual topology to ease the meshing of complicated geometry. - Partition geometry to enable different meshing techniques.

Abaqus/CAE: Geometry Import and Meshing	
Prerequisites	Introduction to Abaqus/CAE or equivalent.
Available Online	Yes

Abaqus/Explicit: Advanced Topics	
Course Code	SIM-en-ADXP-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	18.67 hours
Course Material	
Level	Advanced
Audience	This course is recommended for relatively new Abaqus/Explicit users and Abaqus/Standard users who want to learn Abaqus/Explicit, regardless of industry or application.
Description	This course emphasizes practical skills and techniques that are needed for analyses with Abaqus/Explicit. The course uses examples derived from actual industrial applications to reinforce the concepts and issues discussed in the lessons.
Objectives	The topics discussed include the following. - The explicit dynamics method - General contact - Automatic mass scaling for impact problems - Automatic mass scaling for quasi-static problems - Using Abaqus/Explicit and Abaqus/Standard together to solve difficult problems, including results transfer and co-simulation - Modeling high-strain-rate deformation and failure - Output filtering - Managing large models
Prerequisites	Introduction to Abaqus or equivalent.
Available Online	Yes

Abaqus for Offshore Analysis	
Course Code	SIM-en-OFFSH-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	12.75 hours
Course Material	
Level	Advanced
Audience	This course is recommended for engineers with experience using Abaqus who work in the Oil and Gas industry.
Description	The offshore oil and gas industry has some unique analysis challenges. Complex loading conditions, often highly nonlinear stress states and extensive contact requires advanced FEA software and experienced analysts to be successful. This course was designed for Abaqus customers in the Oil and Gas industry to provide them a more in-depth, industry-specific training. This course is composed of lectures, demonstrations and hands-on workshops.
Objectives	The topics covered in this course include: - Review nonlinear material behavior (metal plasticity and hyperelasticity) - Capabilities of Abaqus element types in general - Specific element discussions include drag chain, pipe, PSI and ITT elements - Pipe-soil interaction, including lateral buckling of a pipe line on a seabed - Abaqus/Aqua capabilities in Abaqus/Standard to model wave, buoyancy, current & wind loading - Coupled Eulerian-Lagrangian (CEL) approach in Abaqus/Explicit

Abaqus for Offshore Analysis	
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Adaptive Remeshing in Abaqus/Standard	
Course Code	SIM-en-ADAP-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	6.17 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who require adaptive re-meshing to meet specified solution accuracy criteria.
Description	This course provides an in-depth coverage of the Abaqus features which address adaptive remeshing for solution accuracy. Abaqus/CAE and Abaqus/Standard work together to adaptively remesh your model in response to user-specified criteria. These criteria include error indicator and mesh-size targets. Usage can be manual or fully automatic, providing options to control the way the adaptivity process is executed. This capability eliminates the mesh-related uncertainty associated with the analysis by using well-established methods for calculating solution error indicators, which in turn drive the remeshing process, ultimately providing a balance between solution accuracy and cost.
Objectives	The topics discussed include the following. Workshops and example problems are used to illustrate the techniques. - Overview and comparison of adaptivity techniques in Abaqus - Basics of adaptive remeshing - Error indicators and the associated output variables - Specification of adaptive remeshing rules - The adaptive remeshing process

Adaptive Remeshing in Abaqus/Standard	
	- Setting up an adaptive remeshing process
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Advanced Abaqus Scripting	
Course Code	SIM-en-SCRPT-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	20 hours
Course Material	
Level	Advanced
Audience	This course is recommended for all Abaqus users who have a basic familiarity of scripting and are looking to sharpen their skills.
Description	This course is offered as a follow-up to the Introduction to Abaqus Scripting course. It is a deeper dive into both Python and the Abaqus Scripting Interface and gives users more hands on exposure with practically oriented workshops of moderate complexity. This course also provides pointers for more specialized and advanced topics.
Objectives	After attending this course, students will be able to: - Write scripts of moderate complexity to automate pre- and postprocessing tasks and improve productivity - Use best practices for maintaining Abaqus scripts and optimizing their performance - Use advanced techniques to take advantage of the Abaqus Object Model - Set up parametric studies using ASI - Build and modify simple GUI plug-ins using the Really Simple GUI (RSG) framework - Leverage built-in features of Python to build applications - Write Python scripts for utility tasks that interface with the operating system and file system

Advanced Abaqus Scripting	
	- Understand how to locate and utilize powerful third-party Python modules - Understand and utilize Python's object-oriented features
Prerequisites	The Introduction to Abaqus Scripting course is highly recommended before attending this seminar. Users proficient with programming (in at least one language) and who are reasonable familiarity with Abaqus/CAE may attend both seminars in series. More experienced Abaqus users already familiar with basics of scripting using Python may attend this advanced seminar directly.
Available Online	Yes

Analysis of Composite Materials with Abaqus	
Course Code	SIM-en-MAT-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	21.33 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts whose work involves composite materials.
Description	Composite materials are used in many design applications because of their high stiffness-to-weight ratios. This course shows you how to use Abaqus effectively to model composite materials.
Objectives	Upon completion of this course you will be able to: - Define anisotropic elasticity for combining the fiber-matrix response - Define composite layups using Abaqus/CAE - Achieve the correct material orientation of the layers of composite shells and solid elements - Model sandwich composite structures and stiffened composite panels - Model progressive damage and failure in composites - Model delamination and low-cycle fatigue of composite structures
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Analysis of Geotechnical Problems with Abaqus	
Course Code	SIM-en-GEOT-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	11.50 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform geotechnical simulations.
Description	This course provides an overview of modeling geotechnical problems with Abaqus, including issues related to experimental testing, calibration of constitutive models and coupling between fluid flow and stress/deformation in the analysis of porous media. Modeling issues related to geotechnical problems are addressed and numerous illustrative examples are examined.
Objectives	The topics covered in this course include the following: - An overview of modeling geotechnical problems - Experimental testing and how it relates to the calibration of constitutive models for geotechnical materials - Using and calibrating the different geotechnical material constitutive models available in Abaqus and their limitations - The coupling between fluid flow and stress/ deformation in the analysis of porous media - Modeling issues related to geotechnical problems
Prerequisites	Introduction to Abaqus and experience using Abaqus/ Standard.

Analysis of Geotechnical Problems with Abaqus

Available Online	Yes

Automating Analysis in fe-safe	
Course Code	SIM-en-AAFS-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	6.42 hours
Course Material	
Level	Advanced
Audience	Simulation Analysts
Description	In this course you will learn how to extend fatigue analysis originally configured in the fe-safe GUI to include different methods of automated fatigue analysis. This includes exporting and importing a project archive and using project settings files generated in the fe-safe GUI. Automation can be completed using a command line execution, macro file, or batch file. The different ways of opening the FEA solution will be discussed in the context of these methods. You will learn how to change one or more settings in an fe-safe analysis using each of these methods. The examples include analyses with verity in fe-safe as well as fe-safe/Rubber. Integration with SIMULIA Isight and Tosca Structure will be covered.
Objectives	Upon completion of this course you will be able to: - Set up and run various automated fatigue analyses using fe-safe - Export a project configured in the fe-safe GUI to replicate analysis - Use a full read to import a new FEA solution or refresh the existing solution - Change settings and run analysis from the command prompt - Use pre-scanning and group commands in a macro file

Automating Analysis in fe-safe	
	- Change settings and run analysis in a macro - Execute a macro from the command line or in the fe-safe GUI - Change settings and run analysis in a batch file - Troubleshoot and customize automation of fatigue analyses
Prerequisites	Introduction to fe-safe
Available Online	Yes

Automotive NVH with Abaqus	
Course Code	SIM-en-NVH-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	20 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform analyses related to automotive NVH.
Description	Vehicle NVH (Noise, Vibration and Harshness) is typically perceived as a reflection of vehicle quality. As a result, the primary goal of NVH design is to optimize the energy absorption of the vehicle. Large-scale linear dynamics is typically employed in NVH analysis. This course focuses on applying the linear dynamics capabilities in Abaqus to NVH-related simulation. Additional appendix material is included to provide guidance for users translating Nastran models to Abaqus.
Objectives	Upon completion of this course you will be able to: - Perform natural frequency extractions - Perform sound radiation analyses (acoustics) - Include nonlinear preloading effects in your NVH simulations - Perform Brake squeal analyses - Create constraints and connections for Automotive NVH models - Use substructuring techniques to run your NVH simulations more efficiently - Perform advanced NVH postprocessing (via plugins)

Automotive NVH with Abaqus	
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus. Linear Dynamics with Abaqus is also recommended but not required.
Available Online	Yes

Buckling, Postbuckling and Collapse Analysis	
Course Code	SIM-en-BUCK-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	16.17 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform buckling, postbuckling and collapse analysis.
Description	Buckling and postbuckling behavior is critical to the success of certain designs. For example, crashworthiness of an automobile requires that particular vehicle components collapse in ways that maximize energy absorption. On the other hand, successful designs of imperfection-sensitive, thin-walled shell structures, ranging from beverage containers to large pressure vessels, must prevent unintentional buckling. This course blends the theoretical background on such topics as geometric nonlinearity and the Riks method together with examples, guidelines and workshops to illustrate how to simulate buckling and postbuckling behavior.
Objectives	Upon completion of this course you will be able to: - Identify an imperfection-sensitive structure - Extract closely-spaced eigenvalues efficiently - Introduce imperfections into a “perfect” mesh - Use the Riks method effectively - Use damping to control unstable motions
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.

Buckling, Postbuckling and Collapse Analysis	
Available Online	Yes

Composites Modeler for Abaqus/CAE	
Course Code	SIM-en-CMA-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	15.17 hours
Course Material	
Level	Advanced
Audience	This course is recommended for users who are already familiar with the native Abaqus/CAE composites modeling functionality.
Description	This is a two-day course on Composites Modeler for Abaqus/CAE, an add-on product that complements and extends the powerful ply modeling features in Abaqus/CAE. Composites Modeler for Abaqus/CAE provides proven fiber simulation capabilities and advanced model building—all seamlessly integrated within Abaqus/CAE. It allows you to model composite structures in Abaqus/CAE in a way that reflects the composite's manufacturing processes.
Objectives	In this course you will learn: - How to use Composites Modeler for Abaqus/CAE to account for accurate fiber angles and ply thicknesses in Abaqus simulations to achieve unprecedented accuracy - How to review and quickly modify your composites models to iteratively improve your designs - How to use your composites model to generate manufacturing data thereby ensuring that the analyzed model closely corresponds to the real structure

Composites Modeler for Abaqus/CAE	
Prerequisites	The Analysis of Composite Materials with Abaqus course is recommended as a prerequisite. At the very least, attendees should be familiar with the Abaqus/CAE composite layup functionality. Attendees should also be comfortable post-processing the results of composites simulations using Abaqus/CAE. An understanding of how composites are manufactured is also helpful.
Available Online	Yes

Connector Elements and Mechanism Analysis with Abaqus	
Course Code	SIM-en-FLEX-A-V30R2024
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	16.67 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will model connections of varying complexity between multiple (rigid or flexible) bodies.
Description	The combination of mechanisms, rigid bodies, and finite elements in Abaqus makes a powerful simulation tool. The mechanism capability expands the ability of Abaqus to model connections among individual bodies in a variety of ways. Connections can be as simple as pins and rigid links or as complicated as nonlinear frictional joints with elasticity and failure. In this course you will explore the variety of connection types available in Abaqus and learn how to define connections that suit your needs.
Objectives	The following topics covered in this course: - Comparison of connectors and MPCs - Basic connector components - Assembled kinematic connections - Local relative displacements and rotations - Connector elasticity - Connector friction - Connector failure - Stops and locks - Actuating components of relative motion - Sensors and actuators

Connector Elements and Mechanism Analysis with Abaqus	
	- Output and postprocessing
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Co-simulation with Abaqus and Dymola	
Course Code	SIM-en-DYM-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	5.50 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who need to include logical modeling elements into their simulations.
Description	Abaqus-Dymola co-simulation is useful when logical modeling needs to be included in a physical system simulation; for example, it can be used to couple Anti-lock Braking System (ABS) logic modeled in Dymola with an Abaqus rolling tire and brake simulation. In a typical workflow, sensor data computed in Abaqus (the physical system) are passed to Dymola (the controller), which in turn computes the needed actuation to drive the Abaqus model to a desired state. The powerful logical modeling features in Dymola cover a wide variety of engineering fields, such as electromechanics, control systems, hydraulics, penumatics, etc. This course illustrates coupling Dymola and Abaqus to develop a very versatile logical-physical modeling capability.
Objectives	Upon completion of this course you will be able to: - Set up an Abaqus model for Abaqus-Dymola co-simulation - Create a simple control system in Dymola for co-simulation - Run a co-simulation between Abaqus and Dymola models

Co-simulation with Abaqus and Dymola	
	- Review the co-simulation results
Prerequisites	Introduction to Abaqus or equivalent. Experience using Abaqus and a basic understanding of control systems. Some familiarity with Dymola usage is helpful but not required.
Available Online	Yes

Crashworthiness Analysis with Abaqus	
Course Code	SIM-en-CRASH-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	19.17 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform structural crashworthiness or occupant safety simulations.
Description	This course is the ideal way to obtain a working knowledge of how to use Abaqus for crashworthiness analysis. The course is ideal for users who are already familiar with other crash codes and would like to transition to Abaqus. The course does not cover the use of preprocessors and introduces you to the analysis capabilities of Abaqus using the keyword interface. The course uses examples derived from actual industrial applications to reinforce the concepts and issues discussed in the lectures.
Objectives	This course covers the following topics: - Abaqus fundamentals and input syntax - General “automatic” contact modeling - Element selection for crash simulation - Constraints and connections modeling - Material models used in crash simulation - Multiple mechanism damage and failure modeling
Prerequisites	No previous knowledge of Abaqus is required, but knowledge of finite elements and engineering mechanics is necessary.

Crashworthiness Analysis with Abaqus	
Available Online	Yes

CZone for Abaqus	
Course Code	SIM-en-CZA-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	4.67 hours
Course Material	
Level	Advanced
Audience	This course is recommended for experienced users of Abaqus/Explicit who will perform crush analysis of composite structures.
Description	This half-day course is an introduction to CZone for Abaqus (CZA), an add-on capability to Abaqus/Explicit that provides access to a state-of-the-art methodology for crush simulation. Based on CZone technology from Engenuity Ltd., CZone for Abaqus provides for inclusion of material crush behavior in Abaqus/Explicit simulations of composite structures subjected to impact.
Objectives	Upon completion of this course you will be able to: - Include crushable composite structures in your impact simulations - Understand guidelines for defining crushable composite materials based on composite coupon and component testing - Incorporate crushable composite structures into your models and postprocess CZA analysis results
Prerequisites	The Abaqus/Explicit: Advanced Topics and Analysis of Composite Materials with Abaqus courses are recommended as prerequisites. Experience using Abaqus/Explicit is also recommended.

CZone for Abaqus	
Available Online	Yes

Electrochemical Simulation with Abaqus for Li-ion Batteries	
Available Releases	SIMULIA 2023 , SIMULIA 2024
Duration	16.75 hours
Course Material	
Level	Advanced
Audience	Simulation analysts whose work involves assessing the design and response of Li-ion batteries from a multiphysics perspective.
Description	This course introduces you to cell-level multiscale, multiphysics analysis that allows modeling and assessment of the electrochemical performance of Li-ion batteries based on porous electrode theory, the thermal effects from various losses (associated with the ionic diffusion, electrical conduction, entropy change and intercalation) and the mechanical effects due to lithiation-induced swelling in a fully coupled manner. The knowledge gained will allow you to further benefit from the capability by enabling optimization of cell design and performance with respect to a slew of parameters virtually. The lectures introduce and illustrate the key aspects, usage and the basic theory behind this advanced capability with examples while the workshops provide hands-on experience in setting up the complete model and performing the electrochemical analysis of a 3D cell.
Objectives	Upon completion of this course you will be able to: - Create geometry and meshing for modeling Li-ion batteries - Define material properties for Li-ion batteries - Perform battery electrochemical analyses - Define contact and constraints - Postprocess Li-ion battery analyses

Electrochemical Simulation with Abaqus for Li-ion Batteries	
Prerequisites	This course is recommended for engineers with experience using Abaqus.
Available Online	Yes

Electromagnetic Analysis with Abaqus	
Course Code	SIM-en-EMAG-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	9.25 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform electromagnetic simulation with Abaqus.
Description	Abaqus provides computational electromagnetic capabilities for the simulation of problems involving steady-state electrical conduction, piezoelectric phenomena and low-frequency eddy currents. In this course, you will learn how to analyze low frequency eddy current problems in Abaqus/Standard.
Objectives	Upon completion of this course you will be able to do the following with Abaqus: - Set up and create electromagnetic models - Perform low frequency eddy current analyses - Perform transient eddy current analyses - Perform magnetostatic analyses
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Element Selection in Abaqus	
Course Code	SIM-en-ELEMC-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	13.75 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform advanced nonlinear analysis, regardless of industry or application.
Description	Choosing an element is one of the most fundamental questions that users must answer as they build a finite element model. Many issues should be considered when selecting an element, including: Is there contact in the model? Is the material behavior fully or nearly incompressible? Will the element bend during the analysis? Is the structure thick or thin? Will the mesh become severely distorted? What results are needed from the analysis? Is the analysis a static or dynamic simulation? This course provides an overview of the different element types available in Abaqus for stress analyses. Differences between the Abaqus/ Standard and Abaqus/Explicit element libraries are considered. Application-specific recommendations for choosing an element type are provided. The pitfalls and symptoms of choosing incorrect element types are also discussed. Examples and workshops are used to illustrate element behavior and the consequences of choosing incorrect element types for a given problem
Objectives	Upon completion of this course you will be able to: - Understand the distinguishing characteristics of the wide range of continuum and structural elements available in Abaqus for stress analyses

Element Selection in Abaqus	
	- Understand modeling features that may cause certain types of elements to behave poorly - Choose appropriate element types for different applications including the effects of fully or nearly incompressible material behavior, contact, bending, etc.
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Fatigue of Welds in fe-safe (FWFS)	
Course Code	SIM-en-FWFS-A-V30R2023
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	5.58 hours
Course Material	
Level	Advanced
Audience	Simulation Analysts
Description	This course covers simulating the number of cycles till fatigue failures at welds in welded structures. The methods are based on predicting a crack through a certain thickness, in welded structures at the welds (toe, root, throat, etc.; failure mechanisms in welds can be included). Both classification methods (such as BS5400 and BS7608) and structural stress methods (such as the Verity® module in fe-safe) are included. Examples are provided using FEA output models run in Abaqus, ANSYS or Nastran. Not included is temperature-dependent weld fatigue, or weld processes such as friction stir welding or similar. Non-structural joining such as solder is not covered, nor is nonmetallic joining such as adhesive bonding.
Objectives	Upon completion of this course you will be able to: - Understand modeling requirements for line welds and spot welds - Set up FEA models for weld fatigue and import results into fe-safe - Use BS5400 Weld Finite Life algorithm in fe-safe - Define weld lines for structural stress calculations - Use the Verity module in fe-safe based on structural stress calculations - Select a material for fatigue analysis using structural stress methods

Fatigue of Welds in fe-safe (FWFS)	
	- Run weld methods and/or base metal fatigue simultaneously - Postprocess weld fatigue in fe-safe and using a postprocessor
Prerequisites	Introduction to fe-safe
Available Online	Yes

Fitness-for-Service Analysis with Abaqus	
Course Code	SIM-en-FFSA-F-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	14.67 hours
Course Material	
Level	Fundamental
Audience	This course is recommended for Fixed-Equipment Reliability engineers, Fitness-for-Service engineers, Plant process engineers, Plant-equipment inspectors, Plant managers.
Description	Pressure vessels and piping equipment are periodically assessed based on guidelines prescribed by documents such as ASME/API-579 Fitness-for-Service (FFS). Finite element based Level – 3 assessments are often utilized for assessing equipment with complex geometries and loading conditions. This course discusses methods for modeling common pressure vessels such as distillation towers, storage vessels, etc. using Abaqus/CAE. Methods for application and verification of loads such as weight of contents, internal pressure, etc. using Abaqus/ Standard, as required for Level-3 FFS assessments are also discussed. Procedures for analyzing metal loss using the finite element method by mapping thickness readings from scans are also considered. The following products are covered by this course: Abaqus/CAE, Abaqus/Standard. The course is divided into lectures and workshops. The course's workshops are integral to the training. They are designed to reinforce concepts presented during the lectures. They are intended to provide users with the experience of running and trouble-shooting actual Abaqus analyses.

Fitness-for-Service Analysis with Abaqus	
Objectives	The following topics are covered in this course: - Linear and Nonlinear finite element analysis procedures - Modeling pressure vessel geometries - Modeling loads and boundary conditions - Fitness-for-Service assessment procedures - FEA based Level – 3 Assessment
Prerequisites	None
Available Online	Yes

FSI Simulation with Abaqus and Third-Party CFD Codes	
Course Code	SIM-en-FSI-A-V30R2020
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA V6.12
Duration	8 hours
Course Material	
Level	Advanced
Audience	This seminar is recommended for both structural and CFD engineers with an interest in evaluating and analyzing real world FSI applications.
Description	This seminar provides an introduction to the FSI capability using 3rd-party CFD codes, with an emphasis on enabling users to get started utilizing the capability effectively. Several examples using both Abaqus/Standard and Abaqus/Explicit are used throughout the seminar to illustrate the types of problems that can be solved.
Objectives	Upon completion of this course you will be able to: - Evaluate FSI applications - Create compatible FE and CFD models for FSI - Run FSI problems - Develop co-simulation strategies - Use time incrementation options
Prerequisites	None
Available Online	Yes

GUI Customization with Abaqus	
Course Code	SIM-en-GUIC-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	16.92 hours
Course Material	
Level	Advanced
Audience	This course is recommended for users interested in modifying and extending the capabilities of Abaqus by customizing their Abaqus interface.
Description	Increasingly, Abaqus is being applied to more routine, repeatable workflows and analysis procedures. These workflows can be captured using specialized Abaqus Process Automation tools. One of the more commonly used Process Automation tools is the Abaqus GUI Toolkit. The Abaqus GUI Toolkit provides programming routines that allow you to change the Abaqus graphical user interface (GUI) and build customized applications. Such applications can enable you to capture proven Abaqus-centric workflows and methods for deployment to a wider range of users and generate Abaqus solutions more efficiently and reliably. This course covers basic syntax and the fundamentals of the Abaqus GUI Toolkit through a combination of lectures, examples and workshops. The hands-on workshops are an integral component of learning about the Abaqus GUI Toolkit and represent a significant portion of the course experience. The workshops focus on distinct aspects of the GUI Toolkit and build upon each other in order to create a complete stand-alone application.
Objectives	Upon completion of this course you will be able to: - Build dialogs and issue commands from the GUI

GUI Customization with Abaqus	
	- Create and modify GUI modules and toolsets - Create custom applications
Prerequisites	This course assumes prior knowledge of the Python programming language and the Abaqus kernel commands. Thus, students must attend the Introduction to Abaqus Scripting course prior to attending this class. Experience with object-oriented programming and GUI toolkits is recommended, but not required.
Available Online	Yes

Heat Transfer and Thermal-Stress Analysis with Abaqus	
Course Code	SIM-en-HEAT-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	13 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts whose work involves assessing the thermal response of structures and/or the thermal influence on mechanical response.
Description	The success of many structural designs requires a thorough understanding of both the thermal and mechanical response of the design. Temperature-dependent material properties, thermally-induced deformation, and temperature variations all may be important design considerations. This course introduces you to the heat transfer and thermal-stress capabilities available within Abaqus. Practical examples and workshops are used to illustrate these capabilities.
Objectives	Upon completion of this course you will be able to: - Perform steady-state and transient heat transfer simulations - Solve cavity radiation problems - Model latent heat effects - Perform sequentially-coupled, fully-coupled and adiabatic thermal-stress analyses - Model contact in heat transfer problems

Heat Transfer and Thermal-Stress Analysis with Abaqus	
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Introduction to Abaqus	
Course Code	SIM-en-ABI-F-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	27.25 hours
Course Material	
Level	Fundamental
Audience	This course is recommended for new Abaqus users who will primarily use Abaqus/CAE to create their models.
Description	This course is a comprehensive and unified introduction to the modeling and analysis capabilities of Abaqus. It teaches you how to solve linear and nonlinear problems, submit and monitor analysis jobs and view simulation results using the interactive interface of Abaqus. The following products are covered: Abaqus/CAE, Abaqus/Standard and Abaqus/Explicit.
Objectives	The course covers the following topics: - Linear and nonlinear structural analysis - Static, dynamic and heat transfer analysis - Material models: linear elasticity, hyperelasticity and metal plasticity - Loads and constraints - Modeling contact - Selecting the appropriate elements for your problem - Feature-based modeling, parts and assemblies - Working with CAD geometry and imported meshes - Mesh generation techniques - Creating, submitting and monitoring analysis jobs - Viewing simulation results - Restarting an analysis The course is divided into lectures, demonstrations and workshops. The

Introduction to Abaqus	
	course's workshops are integral to the training. They are designed to reinforce concepts presented during the lectures and demonstrations. They are intended to provide users with the experience of running and trouble-shooting actual Abaqus analyses.
Prerequisites	No previous knowledge of Abaqus is required, but some basic knowledge of finite elements, interactive modeling and continuum mechanics is desirable.
Available Online	Yes

Introduction to Abaqus/CAE	
Course Code	SIM-en-ICAE-F-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	15.75 hours
Course Material	
Level	Fundamental
Audience	This course is recommended for new Abaqus/CAE users.
Description	This introductory course introduces you to Abaqus/CAE, the interactive interface for Abaqus products. Abaqus/CAE provides a complete interactive environment for creating Abaqus models, submitting and monitoring analysis jobs and viewing and manipulating simulation results.
Objectives	Upon completion of this course you will be able to use Abaqus/CAE to: - Create complete finite element models. - Submit and monitor analysis jobs. - View and evaluate simulation results.
Prerequisites	Some familiarity with interactive preprocessors is helpful but not required.
Available Online	Yes

Introduction to Abaqus/Standard and Abaqus/Explicit	
Course Code	SIM-en-IABA-F-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	17.17 hours
Course Material	
Level	Fundamental
Audience	This course is recommended for new Abaqus users who will primarily use third-party preprocessors and whose work will require routine editing of input files.
Description	This introductory course introduces you to the analysis capabilities of Abaqus using the Abaqus keywords interface. It is the ideal way for those who will primarily use third-party preprocessors to obtain a working knowledge of both Abaqus/Standard and Abaqus/Explicit to solve linear and nonlinear problems. The following products are covered: Abaqus/Standard, Abaqus/Explicit and Abaqus/Viewer. If interested in the interactive interface of Abaqus, consider the Introduction to Abaqus course instead.
Objectives	The course covers the following topics: - Fundamental modeling techniques and syntax - Linear and nonlinear statics - Selection of the appropriate element for your problem - Adaptive load incrementation and convergence criteria - Interpretation of messages issued by Abaqus - Geometric, material and contact-induced nonlinearity - Linear elasticity and metal plasticity - Restarting of analyses

Introduction to Abaqus/Standard and Abaqus/Explicit	
	- Appropriate modeling techniques for contact problems - Eigenfrequency extraction - Linear and nonlinear dynamics - Model transfer between Abaqus/Explicit and Abaqus/Standard The course's workshops are an integral part of the training. They are designed to reinforce the concepts presented during the lectures and to provide users with the experience of running and trouble-shooting actual Abaqus analyses. The workshops also provide instruction on using Abaqus postprocessors for results evaluation.
Prerequisites	No previous knowledge of Abaqus is required, but some basic knowledge of finite elements and continuum mechanics is desirable.
Available Online	Yes

Introduction to Abaqus Scripting	
Course Code	SIM-en-ISRPT-F-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	16.75 hours
Course Material	
Level	Fundamental
Audience	We believe every Abaqus user should be familiar with the ASI. Productivity gains can be realized at many levels; from simple scripts that automate tedious tasks to large applications with custom user interfaces. This course is recommended for all Abaqus users who wish to improve their productivity using scripting.
Description	Abaqus makes extensive use of Python, a powerful, object-oriented scripting language that is used widely by organizations throughout the world. Python has been embedded within the Abaqus software products. The language has been extended to include a rich set of commands that are well suited for the daily tasks of a finite element analyst. These extensions are referred to as the Abaqus Scripting Interface (ASI). The Abaqus Scripting Interface may be used by the finite element analyst at many different levels. Scripts can be written as stand-alone utilities, or can be written to integrate the Abaqus products with other codes. At a basic level, scripts may be used to automate repetitive tasks such as the creation of results plots from a collection of output files. With some experience, users may actually extend the functionality of the Abaqus products. Advanced users may work with SIMULIA affiliates to customize the graphical user interface of the Abaqus interactive products (Abaqus/CAE and Abaqus/Viewer). This course covers basic usage of the Abaqus Scripting Interface and Python's syntax. It

Introduction to Abaqus Scripting	
	includes numerous hands-on exercises for the student to learn to automate tasks that are common to most analysts.
Objectives	The goals of the course are to allow the student to: - Develop a high-level understanding of the Abaqus scripting capabilities. - Understand the technical details of Python and the Abaqus Scripting Interface. - Understand the strengths and weaknesses of Abaqus scripting.
Prerequisites	In order for the training to be effective, all students should have some basic familiarity with the Abaqus products including Abaqus/Viewer and Abaqus/Standard or Abaqus/Explicit. Familiarity with Abaqus/CAE is very helpful. Students should also have some experience using at least one computer programming language, text editing, and should be proficient with basic operating system tasks such as file copying/deleting, creating/modifying environment variables, etc.
Available Online	Yes

Introduction to fe-safe	
Course Code	SIM-en-IFES-F-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	10.83 hours
Course Material	
Level	Fundamental
Audience	Simulation Analysts
Description	Durability is a requirement for product creation in many industries, because cycling loads can cause damage much sooner than a static load. This course introduces fatigue life calculations in fe-safe and gives you an understanding of how to configure a fatigue analysis based on FEA solutions. These life results can be used to iterate on a design and improve the overall durability of the design. The course is divided into lectures and workshops. The course's workshops are integral to the training. They are designed to reinforce concepts presented during the lectures. They are intended to provide users with the experience of running and trouble-shooting actual fatigue analyses.
Objectives	Upon completion of this course you will be able to set up and run various fatigue analyses using fe-safe, including: - Import FEA solutions into fe-safe - Select a material for fatigue analysis - Define fatigue loadings - Run room temperature fatigue analysis in fe-safe - Understand the most commonly used fatigue algorithms - Use factor of strength to evaluate a target life - Understand the fatigue life results

Introduction to fe-safe	
	- Request additional exports and outputs
Prerequisites	None
Available Online	Yes

Introduction to fe-safe/Rubber	
Course Code	SIM-en-IFSR-F-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2024
Duration	11.25 hours
Course Material	
Level	Fundamental
Audience	Simuation Analysts
Description	This 2-day course provides background information and hands-on experience for calculating fatigue of elastomers using Abaqus and fe-safe/Rubber.
Objectives	Upon completion of this course you will be able to: - Understand rubber physics and fatigue crack growth behavior of rubber. - Use Abaqus/CAE to create and run models for use in fe-safe/Rubber. - Use fe-safe/Rubber to create complete rubber component fatigue analysis models. - Use fe-safe/Rubber to submit and monitor rubber fatigue analysis jobs. - Use Abaqus/Viewer and other tools to view and evaluate fe-safe/Rubber results.
Prerequisites	- Introduction to Abaqus - Introduction to fe-safe
Available Online	Yes

Introduction to Isight	
Course Code	SIM-en-ISGT-F-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	12.67 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 Tosca Structure	
Course Code	SIM-en-TOSCST-F-V30R2023
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023
Duration	15.42 hours
Course Material	
Level	Fundamental
Audience	Simulation Analysts
Description	This course is a comprehensive introduction to the structural optimization capabilities of Tosca Structure.
Objectives	Upon completion of this course you will be able to: - Upon completion of this course you will be able to create optimal design concepts or improve existing designs of mechanical structures: - Solve fundamental topology, shape, sizing and bead optimization problems - Optimize parts regarding weight, stiffness and durability - Visualize, evaluate and transfer optimization results
Prerequisites	None (basic knowledge of finite element analysis)
Available Online	Yes

Isight Component Development	
Course Code	SIM-en-ISCD-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	13.25 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

Linear Dynamics with Abaqus	
Course Code	SIM-en-LNDYN-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	16.33 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform linear dynamic analysis.
Description	This course introduces the user to the algorithms and methods used to study linear dynamic problems with Abaqus/Standard. The workshops reinforce the fundamental concepts presented in the lectures.
Objectives	Upon completion of this course you will be able to: - Extract eigenmodes about a certain frequency - Determine whether the number of extracted eigenmodes is sufficient to represent the structure's response adequately - Perform transient, steady-state, response spectrum and random response analyses using the eigenmodes - Use multiple base motions - Apply damping in linear problems
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Metal Forming with Abaqus	
Course Code	SIM-en-METF-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	20.50 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform metal forming analysis.
Description	Metal forming processes are highly nonlinear because they involve geometric, material and contact nonlinearities. Therefore, simulating these processes numerically can be a difficult task. However, numerical simulations of forming processes present advantages that outweigh the difficulties. Numerical simulation can reduce both the cost and length of a product development cycle by identifying potential forming problems prior to tooling fabrication and reducing the time and cost associated with tooling rework. Numerical simulation can also improve the quality of the part being manufactured through testing to ensure that the manufacturing processes appropriately account for springback and stretching of the parts. Using lectures and hands-on workshops, this course provides practical modeling skills and techniques for simulating forming processes.
Objectives	In this course you will learn practical modeling skills and techniques for: - Stamping - Hydroforming - Punch stretching - Forging - Rolling

Metal Forming with Abaqus	
	- Drawing - Superplastic forming
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Metal Inelasticity in Abaqus	
Course Code	SIM-en-METAL-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	12.25 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts whose work involves evaluating the inelastic response of metals.
Description	Properly modeling the inelastic behavior of materials is very important when evaluating the performance of a design in critical loading situations. This course provides a brief overview of the inelastic behavior observed in metals and the basic concepts of plasticity theory. The course shows Abaqus users how to model various forms of metal plasticity using a combination of examples and workshops to demonstrate the material models and the type of experimental data necessary to calibrate them. The assumptions and limitations of the various plasticity and creep models are also discussed.
Objectives	Upon completion of this course you will be able to model: - 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

Metal Inelasticity in Abaqus	
	- Creep behavior in metals
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Modeling Contact and Resolving Convergence Issues with Abaqus	
Course Code	SIM-en-MCRC-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	22.25 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform advanced nonlinear analysis, regardless of industry or application.
Description	This course provides an in-depth discussion on solving nonlinear problems in Abaqus/Standard with an emphasis on modeling and convergence-related issues for contact. Convergence issues related to complicated material models and geometrically unstable behavior are also covered. Many years of practical experience in understanding and resolving convergence issues have been condensed into this course. The course is divided into lectures and workshops. The course's workshops are integral to the training. They are designed to reinforce concepts presented during the lectures. They are intended to provide users with the experience of running and troubleshooting actual Abaqus analyses.
Objectives	Upon completion of this course you will be able to: - Understand how nonlinear problems are solved in Abaqus - Develop Abaqus models that will converge - Identify modeling errors that cause models to experience convergence difficulties - Recognize when a problem is too difficult or too ill-posed to be solved effectively

Modeling Contact and Resolving Convergence Issues with Abaqus	
	- Define contact interactions - Define appropriate surfaces (rigid or deformable) - Model frictional contact - Model large sliding between deformable bodies - Resolve overclosures in interference fit problems
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Modeling Contact with Abaqus/Standard	
Course Code	SIM-en-CONT-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	18.17 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform advanced nonlinear analysis, regardless of industry or application.
Description	Understanding the interaction between bodies is essential for solving many engineering problems. Manufacturing processes, gears, bearings, seals and dynamic impact events all involve contact. This course covers many techniques and guidelines for solving challenging contact problems. Participants are given a brief overview of the contact formulation and contact logic used in Abaqus/Standard. The hands-on workshops provide ample opportunity to use the concepts developed in the lectures and to learn how to postprocess the results of a contact analysis.
Objectives	Upon completion of this course you will be able to: - Define general contact and contact pairs - Define appropriate surfaces (rigid or deformable) - Model frictional contact - Model large sliding between deformable bodies - Resolve overclosures in interference fit problems - Avoid overconstraining the model - Avoid rigid body motions and unstable motions - Use pre-tension sections to simulate assembly loads

Modeling Contact with Abaqus/Standard	
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Modeling Extreme Deformation and Fluid Flow with Abaqus	
Course Code	SIM-en-FLOW-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	11.67 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts whose work involves modeling extreme deformation and fluid flow.
Description	Abaqus includes several advanced techniques for modeling extreme deformation and fluid flow. The pure Eulerian analysis capability in Abaqus/Explicit allows for effective modeling of fluid flows and extremely large deformations in solids. Coupling the power of this capability with the traditional Lagrangian approach makes it possible to simulate complicated multiphysics phenomena such as fluid-structure interactions where highly deformable materials interact with relatively stiff bodies. The need for modeling high-velocity impacts, extremely violent fluid flows, and material phase changes requires the use of Smoothed Particle Hydrodynamics, a meshless Lagrangian method capable of solving these challenging problems efficiently. This course aims at providing users with a solid understanding of the Coupled Eulerian-Lagrangian (CEL) and Smoothed Particle Hydrodynamic (SPH) methods and illustrating approaches to setting-up and analyzing real world problems using these advanced analysis methods.

Modeling Extreme Deformation and Fluid Flow with Abaqus	
Objectives	Upon completion of this course you will be able to: Coupled Eulerian-Lagrangian (CEL) method - Create Eulerian meshes and define the initial material location within an Eulerian mesh - Apply initial conditions, boundary conditions and loads to materials in the Eulerian domain - Use general contact to model Eulerian-Lagrangian interactions - Model fluids using the Equation-of-State material model - Visualize material boundaries within the Eulerian domain Smoothed Particle Hydrodynamic (SPH) method - Create SPH meshes - Automatically convert conventional continuum elements to SPH particles - Define initial conditions, boundary conditions, and loads on SPH particles - Define contact interactions between SPH particles and element-based or analytical surfaces - Understand the differences between the CEL and SPH approaches
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Modeling Fracture and Failure with Abaqus	
Course Code	SIM-en-FRAC-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	20.17 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform fracture and failure studies.
Description	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.
Objectives	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
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.

Modeling Fracture and Failure with Abaqus	
Available Online	Yes

Modeling Rubber and Viscoelasticity with Abaqus	
Course Code	SIM-en-MRUB-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	12.75 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform analysis of rubber components.
Description	Rubber and resilient foam are widely used for a variety of applications, such as seals and gaskets, shock mounts, vibration isolators and tires. The mechanical and chemical properties of these materials allow them to act as excellent seals against moisture, pressure and heat. They also have excellent energy absorption and dissipation capabilities. This course provides a brief overview of finite deformations and the material models available in Abaqus which are used for rubber and resilient foam.
Objectives	Upon completion of this course you will be able to: - Use experimental test data to calculate material constants - Check the stability of the Abaqus material model at extreme strains - Obtain the best possible material constants from the available test data - Select elements for modeling rubber and foams - Design an appropriate finite element mesh - Model viscoelastic behavior in both the time and frequency domain - Use a user subroutine to define the hyperelastic behavior

Modeling Rubber and Viscoelasticity with Abaqus	
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Modeling Stents Using Abaqus	
Course Code	SIM-en-STENT-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	11 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts responsible for the design of medical devices.
Description	The simulation of stent behavior reveals detailed stress-strain distributions that are important in predicting device fatigue life. The complex geometry and material behavior of stents result in highly nonlinear and challenging analyses. This course focuses on the use of Abaqus for modeling and analyzing stents. However, its content can also be useful when modeling other types of medical devices. The course is targeted at engineers responsible for the design of medical devices who are looking to accelerate their understanding of the highly complex mechanical behavior associated with performance of such devices. This course will also prepare attendees to take the next step to simulate stent behavior through in silico representations of the vasculature and using the Living Heart Human Models.
Objectives	Upon completion of this course you will be able to: - Create geometry for modeling stents and tools - Choose the proper element type - Choose material models: elastic-plastic (Stainless Steel), superelastic-plastic (Nitinol), hyperelastic (vessels) - Perform stent analyses: Static, Implicit and Explicit Dynamics

Modeling Stents Using Abaqus	
	- Define contact and constraints - Postprocess stent analyses - Perform fatigue evaluation
Prerequisites	This course is recommended for engineers with experience using Abaqus. Some understanding of Abaqus/CAE is helpful but is not required.
Available Online	Yes

Obtaining a Converged Solution with Abaqus	
Course Code	SIM-en-CONV-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	15.17 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform advanced nonlinear analysis, regardless of industry or application.
Description	Obtaining converged solutions for highly nonlinear simulations can sometimes be challenging. Difficulties can arise, especially in simulations involving contact, complicated material models and geometrically unstable behavior. This course provides an in-depth discussion on solving nonlinear problems in Abaqus/Standard and addressing the most common convergence-related issues. Many years of practical experience in understanding and resolving convergence issues have been condensed into this course.
Objectives	Upon completion of this course you will be able to: - Understand how nonlinear problems are solved in Abaqus - Develop Abaqus models that will converge - Identify modeling errors that cause models to experience convergence difficulties - Recognize when a problem is too difficult or too ill-posed to be solved effectively
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.

Obtaining a Converged Solution with Abaqus	
Available Online	Yes

Optimizing Engineering Methods with Isight	
Course Code	SIM-en-ISOM-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	12.25 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

Optimizing Engineering Methods with Isight	
Available Online	Yes

Structural-Acoustic Analysis Using Abaqus	
Course Code	SIM-en-ACOU-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	13.92 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who will perform acoustic and structural-acoustic analysis.
Description	Abaqus includes a number of capabilities in the area of structural-acoustic analysis. In addition to pure acoustic analysis features, Abaqus includes the capability to couple nonlinear structural analyses with linear acoustic analyses using several different methods. This seminar covers the fundamentals of acoustics phenomena and then shows how to use Abaqus to solve a wide range of acoustics problems.
Objectives	After completing this course you will gain understanding of: - Basics of acoustic phenomena - Radiation boundary conditions - Element selection - Mesh size and mesh density effects for different analysis procedures - Pure acoustics analysis - Coupled structural-acoustic analysis - Scattering and shock analysis - Analysis procedures available for acoustic analysis - Output and postprocessing

Structural-Acoustic Analysis Using Abaqus	
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus. Some understanding of acoustics is helpful but not required.
Available Online	Yes

Substructures and Submodeling with Abaqus	
Course Code	SIM-en-SUPSUB-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	15.25 hours
Course Material	
Level	Advanced
Audience	This course is recommended for simulation analysts who require specialized techniques to study large problems.
Description	The size and complexity of designs that are analyzed and tested with Abaqus continues to grow. Substructures and submodeling are two effective techniques that allow the analyst to study problems that are too large to simulate with a conventional modeling approach. Substructures are useful to break a large problem into several smaller components. Submodeling allows the analysts to successively focus in on the area of interest.
Objectives	Upon completion of this course you will be able to: - Understand the difference between substructuring and submodeling - Build, translate, rotate and reflect substructures - Build preloads into substructures - Design meshes for submodel analysis - Perform solid-to-solid, shell-to-shell, and shell-to solid submodeling
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.

Substructures and Submodeling with Abaqus

Available Online	Yes

Tire Analysis with Abaqus: Advanced Topics	
Course Code	SIM-en-TIRE2-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	8.25 hours
Course Material	
Level	Advanced
Audience	This course is recommended for tire analysts.
Description	Modern tires are among the most complex structures in production and their complexities span a broad range of the capabilities available in Abaqus. This course covers topics addressing advanced tire modeling techniques and serves as a follow-up to the Tire Analysis with Abaqus: Fundamentals course.
Objectives	Topics covered in this course include: - Steady-state rolling using Eulerian techniques in Abaqus/Standard - Transient analysis using Abaqus/Explicit - Hydroplaning simulation using Coupled Eulerian-Lagrangian technique - Efficient steady-state dynamics analysis - Substructuring and submodeling
Prerequisites	Tire Analysis with Abaqus: Fundamentals
Available Online	Yes

Tire Analysis with Abaqus: Fundamentals	
Course Code	SIM-en-TIRE-F-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	12.75 hours
Course Material	
Level	Fundamental
Audience	This course is recommended for tire analysts.
Description	Modern tires are among the most complex structures in production and their complexities span a broad range of the capabilities available in Abaqus. Since tire modeling is a specialized field, this course covers the many important yet basic capabilities in Abaqus that are specifically relevant to tire modeling.
Objectives	In this course you will learn about: - Choosing appropriate elements - Methods of modeling reinforcement - Contact modeling details pertinent to tire modeling - Fundamentals of material modeling-stress and strain measures, material directions - Linear elasticity, hyperelasticity and viscoelasticity - Efficient axisymmetric to three-dimensional model generation and results transfer
Prerequisites	Introduction to Abaqus or equivalent and experience using Abaqus.
Available Online	Yes

Uncertainty Quantification with Isight	
Course Code	SIM-en-ISUQ-A-V30R2024
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	8.33 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

Writing User Subroutines with Abaqus	
Course Code	SIM-en-SUBR-A-V30R2024
Available Releases	SIMULIA 2018 , SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA V6.12
Duration	13 hours
Course Material	
Level	Advanced
Audience	This course is recommended for engineers who need to adapt the capabilities of the Abaqus solvers to their particular needs.
Description	User subroutines in Abaqus allow the program to be customized for particular applications. This course explains when to consider the use of user subroutines and how to approach their development. Detailed descriptions are given of the data required for selected subroutines, the additional statements to be included and the variables that are available within the routines. Particular attention is paid to highlighting good practice in user subroutine development. Examples of various user subroutines are used to illustrate the points made in the lectures.
Objectives	In this course you will learn about: - When and how to use subroutines - DLOAD, VDLOAD, and UTRACLOAD for specifying user-defined loading - FILM for specifying user-defined film conditions - USDFLD and VUSDFLD for defining field variable dependence - UVARM for defining a user output variable - UHYPER and UHYPER_STRETCH for modeling hyperelastic materials - UMAT and VUMAT for allowing constitutive models to be added to the program

Writing User Subroutines with Abaqus	
	- UEL and VUEL for allowing the creation of user-defined elements
Prerequisites	User subroutines are a very advanced feature of Abaqus. Thus extensive experience using Abaqus is strongly recommended. In addition, a strong working knowledge of the finite element method and programming in either FORTRAN or C is desirable.
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 Cooldown Transportation and Mobility	
Course Code	SIM-en-CCFT1-A-V30R2024
Available Release	SIMULIA 2024
Duration	5.75 hours
Course Material	
Level	Advanced
Audience	CFD Analysts and Climate Control Analysits
Description	This course covers the basics of climate control simulation, including comfort, a critical aspect of cabin design that is at the core of the vehicle experience. This course includes an overview of Cabin Comfort simulations, how to create geometry, how to set up PowerTHERM and PowerCASE coupling files for various modes of HVAC, and how to postprocess and analyze cooldown results.
Objectives	Upon completion of this course, you will be able to: - 1. Understand the cooldown workflow using flow development and velocity freezing method - 2. Prepare PowerTHERM geometry for thermal simulation - 3. Set up the PowerTHERM model - 4. Couple PowerTHERM to PowerFLOW - 5. Run Transient Coupled Simulation and Post-Process thermal results
Prerequisites	Basic familiarity with CFD and Cabin Comfort Soak Workflow
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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