Course Catalog

Learning Experience for SIMULIA Electromagnetics

Version 1.0 - 27 May 2025

Written by: Christine COUSIN

Learning Experience | Course Catalog

Learning Experience | Course Catalog

Learning Experience for SIMULIA Electromagnetics - SMEMGLX-OC

CST Studio Suite - Antenna Placement	
Course Code	SIM-en-CSTAPL-A-V30R2025
Available Releases	SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	6.58 hours
Course Material	English
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-V30R2025
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	5.83 hours
Course Material	English
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-V30R2025
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2024 , SIMULIA 2025
Duration	17 hours
Course Materials	Chinese , English , Japanese , Korean
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-V30R2025
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	8.25 hours
Course Materials	Chinese , English , Japanese , Korean
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-V30R2024
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024
Duration	8.33 hours
Course Material	English
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-V30R2025
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	6.33 hours
Course Materials	English , Japanese
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-V30R2025
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	7.83 hours
Course Materials	English , Japanese
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	English
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-V30R2025
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	8.42 hours
Course Materials	Chinese , English , Japanese
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-V30R2025
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	12.75 hours
Course Material	English
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	English
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-V30R2025
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	19.17 hours
Course Material	English
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-V30R2025
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	13.25 hours
Course Material	English
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-V30R2025
Available Releases	SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	12.42 hours
Course Material	English
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-V30R2025
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	8.33 hours
Course Material	English
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	English
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-V30R2025
Available Releases	SIMULIA 2019 , SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	12.25 hours
Course Material	English
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-V30R2025
Available Releases	SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	7.58 hours
Course Material	English
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-V30R2025
Available Releases	SIMULIA 2020 , SIMULIA 2021 , SIMULIA 2022 , SIMULIA 2023 , SIMULIA 2024 , SIMULIA 2025
Duration	8.33 hours
Course Material	English
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


IF WE
TM