

Learning Module

Magnet Simulation with SIMULIA Opera

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

The course includes:

- Overview of magnet technology systems and applications.
- Coil modelling.
- Permanent magnets.
- Modelling and meshing.
- Fields and harmonics.
- Inductance, capacitance and resistance evaluation.
- Eddy current analysis.
- Power dissipation and thermal analysis.
- Calculating forces on coils and stress analysis.
- Shielding AC and DC fields.
- Accelerator Magnet Systems.

Knowledge Prerequisites

Introduction to Opera-3d.

Brands

Simulia

Available Releases

SIMULIA 2020

Duration

16 hours

Discipline

OPERA

Language(s) for selected release

English

Contents

Overview - Magnet Simulation with SIMULIA Opera

- 1 - Overview - Magnet Technology
- 2 - Coil Modeling
- 3 - Permanent Magnets and Materials
- 4 - Modeling and Meshing
- 5 - Field Calculations and Harmonics
- 6 - Inductance, Capacitance and Resistance Evaluation
- 7 - Eddy Current Analysis
- 8 - Power Dissipation and Thermal Analysis
- 9 - Forces on Coils and Stress Analysis
- 10 - Shielding
- 11 - Accelerator Magnet Systems