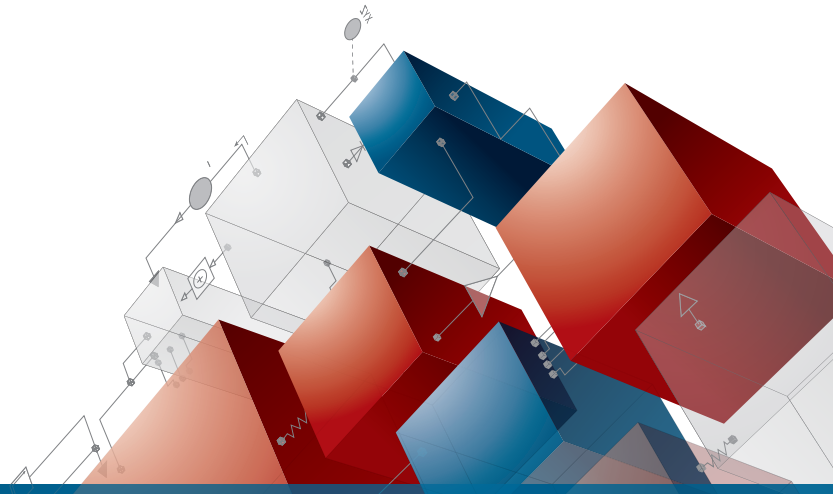
MapleSim Training



Get Productive, Fast!

Our training programs are carefully designed to ensure that you and your colleagues get the most out of Maplesoft products in the shortest possible time. All our instructors are highly skilled in the use of our products, having been deeply involved in many engineering projects across a wide range of applications. Our instructors will help you to bring your skill levels from novice to highly productive in a matter of days, guiding you through best practices and helping you avoid pitfalls.

The core MapleSim™ training course is a three day program. The course can then be extended to allow you to complete your first application with the help of your instructor.

Day 1: The Basics: Getting Started with MapleSim and Maple™

Day 2: Advanced Modeling Techniques

Day 3: Analysis of MapleSim Models in Maple

Day 4 and Beyond: Developing Your Own Application

MapleSim™

MapleSim Training Course Outline

Day 1: The Basics

Getting Started with MapleSim

- Principles of acausal model development
- MapleSim user interface
- A first model (driveline with flexible linkages)
- Model parameters (including editor, scoping)
- Managing components (including user libraries)
- Managing results (plotting, saving, exporting)

Maple Basics

- Equation extraction
- Analysis templates
- Custom components

Incorporating Non-linear Models

- Non-linear functions
- Piecewise functions
- Look-up tables

Model Code Generation

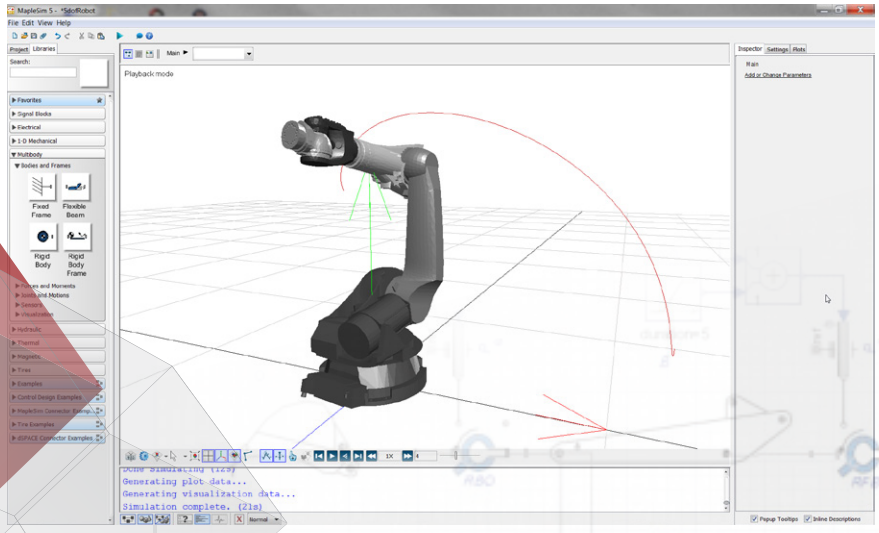
- Model preparation
- Generic automated code generation
- Code generation for specific targets
  - Simulink®
  - NI LabVIEW™
  - dSPACE®
  - User-specific

Day 2: Advanced Modeling Techniques

Focus on Specific Domains

MapleSim supports many different domains. On this day, we will focus on the domains most relevant to you. Attendees can **choose up to four domains** from the list below for in-depth attention. Domain choices must be communicated to the instructor in advance of the session.

- Electrical
- Mechanical
- 3-D Multibody Mechanical *(Note: Due to volume of content, this domain counts as 2 choices)*
- Hydraulics
- Electro-mechanical
- Thermal/Heat-Transfer
- Tire models
- Driveline/Transmission Models
- Battery models
- Power Electronics
- Electric and Hybrid-Electric Vehicles



MapleSim™

Day 3: Analysis of MapleSim Models in Maple

Introduction to Maple User Interface

- Equation entry and editing
- Essential symbolic manipulation and solving
- Maple commands and programming
- Document layout and application building tools

The Maple/MapleSim Interface

- MapleSim component
- API Commands
- Equation extraction in detail
- Data transfer

Running MapleSim Simulations in Maple

- Compiling MapleSim models
- Parallel computation for multiple simulations

Analysis Examples

- Linear systems analysis/Control Design
- Frequency analysis
  - FFTs
  - Eigenvalues/Eigenvectors
- Parameter sweeps/Monte Carlo
- Parameter optimization

Day 4 and Beyond: Building Your Own Application *(Optional)*

This is your opportunity to use the knowledge from days 1, 2 and 3 to develop a MapleSim model that is specific to your own needs. It is strongly recommended that you include at least one day of application building in your training to make the course as relevant as possible to the work that you do. Your instructor will work with you on planning and building a suitable proof-of-concept model that will provide a good starting point for further development after the course is over.

To ensure the success of this session, it is important that you provide a description of what you would like to achieve, in advance. Your instructor can help you determine how many days of training will be required to meet your goals or what would be achievable in the time you have available.

In advance of the session, you will need to provide:

- Description of system you would like to model (diagrams/schematics would be useful)
- Likely domains that will be required in the model (electrical, mechanical, hydraulics, thermal, etc.)
- Type of application it is likely to be used for (control design, HIL, detailed analysis, etc.)
- What analysis (if any) you would like to perform on the model
- Specific areas of focus and priorities
- What you would consider to be a successful outcome for this session

We request that you communicate the agreed-upon scope and goals of this session to all attendees, so everyone has the same expectations.

Additional Options

Custom Content

This course is structured to allow any attendee with little or no prior knowledge of Maple to fully understand the basics of the product before getting into more advanced materials. If you have different requirements, we can work with you to address your needs. Please contact your Maplesoft representative to discuss your requirements further.

On-line Training

On-line training is also available. Training is delivered live using WebEx® technology, which permits meaningful interaction with the instructor throughout the course. Please contact your Maplesoft representative for details.

Application Development Support Service

Harness the knowledge and experience of our Application Engineers to help you complete your Maple project even faster! An Application Development Support contract provides you with full access to a wide range of modeling experts who can provide answers and advice quickly to help keep your projects moving. They can even work directly with you over a WebEx session, so you can test out ideas instantly, together. Please contact your Maplesoft representative for more details.

On-site requirements

You are responsible for providing suitable training facilities for the number of attendees, computers with all necessary software pre-installed, and data projection equipment for the instructor. Temporary licenses for Maplesoft products can be provided if required.

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