

## Simulink Fundamentals for Aerospace Applications

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## Simulink FundamentalsPrerequisitesfor Aerospace4Applications4

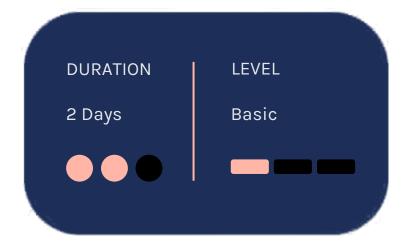
This two-day course provides a comprehensive introduction to the Simulink environment for aerospace engineers. It demonstrates how to create, modify Simulink models and improve simulation accuracy and speed and create reusable model components using subsystems, model references and libraries. MATLAB Fundamentals for Aerospace Applications

### TOPICS Day 1

- Creating and Simulating a Model
- Modeling Programming Constructs
- Modeling Discrete Systems
- Modeling Continuous Systems

#### Day 2

- Solver Selection
- Developing Model Hierarchy
- Modeling Conditionally Executed Algorithms
- Combining Models into Diagrams
- Creating Libraries



### **Creating and Simulating a Model**

**OBJECTIVE:** Create a simple Simulink model, simulate it, and analyze the results.

- Introduction to the Simulink interface
- Potentiometer system
- System inputs and outputs
- Simulation and analysis

#### Modeling **Programming Constructs**

**OBJECTIVE:** Model and simulate basic programming constructs in Simulink.

- Comparisons and decision statements
- Vector signals
- PWM conversion system
- Zero crossings
- MATLAB Function block

#### Modeling **Discrete Systems**

**OBJECTIVE: Model and simulate discrete** systems in Simulink.

- Discrete signals and states
- PI controller system
- Discrete transfer functions and statespace systems
- Multirate discrete systems

### Modeling Continuous Systems

<u>OBJECTIVE:</u> Model and simulate continuous systems in Simulink.

- Continuous states
- Throttle system
- Continuous transfer functions and statespace systems
- Physical boundaries

#### **Solver Selection**

<u>OBJECTIVE:</u> Select a solver that is appropriate for a given Simulink model.

### Developing Model Hierarchy

<u>OBJECTIVE:</u> Use subsystems to combine smaller systems into larger systems.

- Solver behavior
- System dynamics
- Discontinuities
- Algebraic loops

- Subsystems
- Bus signals
- Masks

#### Modeling Conditionally Executed Algorithms

<u>OBJECTIVE:</u> Create subsystems that are executed based on a control signal input.

- Conditionally executed subsystems
- Enabled subsystems
- Triggered subsystems
- Input validation model

#### **Combining Models** into Diagrams

**OBJECTIVE:** Use model referencing to combine models.

- Subsystems and model referencing
- Model referencing workflow
- Model reference simulation modes
- Model workspaces
- Model dependencies

#### **Creating Libraries**

**OBJECTIVE:** Use libraries to create and distribute custom blocks.

- Creating and populating libraries
- Managing library links
- Adding a library to the Simulink Library Browser



# Expand your knowledge

