

The Systems Modeling Language (OMG SysML™)

USING ENTERPRISE ARCHITECT

Course Syllabus

The Systems Modeling Language (SysML) teaches the SysML standard language for Model Based Systems Engineering (MBSE). The course is hands-on and it is composed of standalone modules that cover the different aspects of the language and tool usage.

The course is designed to be customized in order to: Focus on specific subject areas based on the client's specific needs; to take into consideration the mix of roles and skills present in the class; to offer coaching and insight with MBSE and explore possibilities for addressing applicability to certain aspects of production and the development process.

The course includes a practicum, which is a simplified instruction-focused version of a real world project, that students use during the instruction to put learned concepts into immediate practice. Students get a first hand experience with best practices, solution modeling tradeoffs, project structuring & organization, and tool practice.

Syllabus

Module B-01 – Introduction

- Uses of modeling
- Modeling along layers of abstraction
- What is OMG SysML?
- SysML Goals
- The Anatomy of SysML

Module B-02 – Requirements Modeling

- Requirements modeling
- Views & Viewpoints
- Interconnectedness to other Diagrams

Module B-03 – Use Case Modeling

- Use case Modeling
- Identifying Use Cases & Actors
- Use Case Associations
- Use Case Refinement
- Interconnectedness to other Diagrams

Module B-04 – Structural Modeling

- Block diagrams
- Internal Block diagrams
- Block properties
- Relationships in SysML (aggregation, composition, generalization, reference association)
- ValueTypes
- Interfaces
- Flows, Ports & Item Flows
- Interconnectedness to other Diagrams

Module B-05 – Parametrics Modeling

Parametric Modeling
Associating Parametrics with Blocks
Constraint Blocks
Parametric Simulation

Module B-06 – Activity Behavioral Modeling

Activity Modeling
Actions & Object Pins
Modeling Signals & Events
Call Actions for Activity Reuse
Behavior Allocation
Enhanced Functional Flow Block Diagram
Continuous Flow Modeling

Module B-07 – State Machine Behavioral Modeling

State Machine Modeling
States, Events & Transitions
Transition Effects as Behaviors
Composite States

Module B-08 – Additional Behavioral Modeling

Sequence Diagrams
Timing Diagrams

Module E-01 – Cross Cutting Constructs

- Allocations
- Mapping behavioral constructs to structural constructs
- Mapping software to hardware

Module E-02 – Enterprise Architect Extras

Building for traceability

- From requirements to use cases
- From use cases to Block diagrams
- Relationship matrix
- Tracing links using the relationship/hierarchy views & other techniques

Configuration options

- Adding requirement/constraint/stereotypes/tagged values/ language data types
- Import/Export of reference data
- Import/Export Packages across projects
- Reuse a common package between two projects

Document Generation using EA

- Generating documents in EA
- Customizing document generation
- Modeling Master documents

Extending EA

- Built-in Extension Technologies: An Overview
- Building Profiles for standardizing Stereotypes and Tagged Values (language extension)

Module E-03 –Extras

For TcSE users: MDG Integration for TcSE

- Working with the MDG Integration for TcSE
- Connecting an Enterprise Architect (EA) model
- Import/Export between EA and TcSE and package update
- Project Schema Configuration
- Schema Map Editor

Exploring MBSE Methodologies

- The Current State of MBSE with the SysML evolution
- Existing methodologies and proposed/standard processes
- Considerations for adopting the right MBSE methodology
- A fundamental talk about *Adopting MBSE: Formulate your MBSE Strategy before choosing a Methodology*