

Title: Advanced Model-Based Systems Engineering (AMBSE48)

Course page: ctme.caltech.edu/ambse-open

CEUs: 4.8

Lecturer: Michael Brenner

Delivery: On-demand

Description:

This course presents a fresh view of the systems engineering process that delivers essential insights into the interconnectivity of diagrams and relationships, the origins of necessary information, and drives systems thinking throughout a system's life. This course focuses on the practical use of model constructs to simulate real-world scenarios encountered on the job. You will have the confidence to deploy MBSE/SysML on your projects in a manner that adds value and encourages robust systems thinking.

Target Audience:

This course addresses the needs of systems engineering professionals in aerospace, automotive, defense, electronics, energy, and medical devices. Experienced MBSE practitioners and engineering managers will find this program ideal, including those who need to manage modelers and suppliers. This course targets the essential proficiencies needed for OMG certifications for SysML.

Learning Outcomes:

Participants will advance their existing MBSE skills and be able to:

- Apply cross-diagram application of SysML elements effectively
- Use simulation capability across diagrams to its fullest potential
- Establish and enforce systems and model guidelines within your team
- Gain a comprehensive understanding of SysML elements in all nine SysML diagrams
- Seamlessly integrate SysML with other languages and standards
- Evaluate the quality of models from team members and suppliers
- Integrate SysML and models with other tools effortlessly
- Communicate model contents, structure, and analyses clearly to stakeholders
- Gain confidence in immediately applying your new skills on the job.

Topics:

The course covers the required topics for OMG SysML certification for Model Builder Intermediate (MBI) and Model Builder Advanced (MBA):

- Current perspectives on SysML, MBSE, and evolving standards for digital engineering
- SysML diagrams and Magic Grid philosophy
- Model concepts; applying guidelines and standards
- Model evaluations and reviews
- Package diagrams and structures using all SysML constructs
- Libraries, imports, and queries
- Use case models, diagrams, and requirements
- I/O flow, controls, and constraints
- Specialized requirements
- Requirements traceability
- Digital threads in MBSE
- Test cases and verification
- Block diagram features
- Receptions and distributed properties
- Shared and composite aggregation in block relationships
- Generalization sets
- Value types, enumerations, classifiers
- Hierarchy and behavior
- Instance definitions

Training Delivery:

Designed for flexible learning, this self-paced online program provides pre-recorded videos, hands-on training using the provided Dassault Magic System of Systems Architect tool, and asynchronous instructor support via the Caltech Learning Management System.

Participants will be graded pass/fail, based on watching all on-demand lectures and successful building a working digital model.

Pre-Requisite:

Either Caltech Model-Based Systems Engineering (MBSE48), OMG Sys Model User certification, OMG Model Builder Fundamental certification, or equivalent knowledge with permission of the instructor.