



Model-Based Systems Engineering Certificate Program

Fall 2019

► ctme.caltech.edu/mbse

Register today – Seats limited

Format: 5-Day, Public, Instructor-Led

Upcoming Dates: Oct 5, 12, 19, 26/Nov 2

Location: Caltech Campus, Pasadena, CA

Program Objectives

Optimizing execution of design and simulation activities under rapidly changing conditions in complex environments is challenging. It requires new skills in Model-Based Systems Engineering (MBSE), a critical capability in digital engineering. MBSE integrates iterative, comprehensive design, with fact-based insights into implications of choices, changes, and system behaviors.

Through expert-led action learning and hands-on model making using real-world cases, you will be able to articulate the value of MBSE confidently and can hit the ground running in deployments. This program elevates you and your team's capacity to create models that are both flexible and robust, increasing your organization's ability to deliver value as expected.

Learning Objectives

The objective of this five-day program is to focus on the systems thinking throughout the engineering process—from customer needs and requirements gathering to systems modeling to integrated design and delivery.

Learnings include:

- Exploring MBSE in the context of Model Based Engineering (MBE) and complex systems
- Scoping and executing full lifecycle MBSE tasks
- Modeling structures interactions, and behaviors based on requirements and constraints

- Generating appropriate systems models and effectively managing them through tools and methods
- Investigating internal and external interactions
- Assessing trades and implications
- Evaluating, critiquing, and improving SysML structures and models
- Crafting key representations, diagrams, and use-cases
- Building confidence in applying MBSE fundamentals to make meaningful contributions to your projects
- Articulating the economic and operational value of MBSE to stakeholders
- Planning appropriate approaches for implementation and accelerated adoption

Participants

This program addresses the needs of systems engineering professionals in aerospace, defense, electronics, mobility, and advanced medical devices. Senior and early-career engineers, analysts, designers, and developers will examine a structured approach to requirements analysis and systems design and will learn how to improve their planning, execution, and communications skills. Project managers and support teams will explore how MBSE disciplines can enhance enterprise and mission effectiveness and will understand how to manage scope, digital and traditional work products, risk, and teams of diverse talents.

To customize this program for your organization, contact a program advisor. 626.395.4042
ctme@caltech.edu

Why CTME

Leaders who aspire to innovate and execute come to Caltech's Center for Technology and Management Education (CTME). Here, you will do more than attend a class. You will develop new mindsets, technology skills, and leadership capacity to master the complex issues that challenge your organization today.

Instructors with real industry insight—Each of our educators bring decades of real world experience and leadership from roles in research, engineering, commercialization, manufacturing, operations and executive accountability of technology-driven organizations and government agencies.

Action-learning is more than just experiential. We facilitate real impact through small groups working on actual problems which, with Caltech coaching and structure, grows individuals, teams, and organizations to adapt to new challenges.

Concentrated customization is how we distinctively prepare curricula and content. We work with clients to understand their challenges and capability needs for 21st century talent. Integrating your specific context, cases, and methods with the proprietary approaches of Caltech and its affiliates, makes CTME your best learning partner.

Global delivery is how we scale experiences and results. Going beyond online programs, we convene rotating cohorts through their company's international locations. Learners value guided facilitation and mastery where personal interactions are more productive.

About Caltech

Caltech is a world-renowned science and engineering institute that marshals some of the world's brightest minds and most innovative tools to address fundamental scientific questions and pressing societal challenges. Caltech prizes excellence and ambition. The contributions of Caltech's faculty and alumni have earned national and international recognition, including 39 Nobel Prizes. The Institute manages the Jet Propulsion Laboratory (JPL) for NASA.

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Dr. Ron Williamson is a Principal Engineering Fellow at Raytheon, focused on model-based systems engineering and architecture for advanced C4I systems in DoD, International, FAA, and civil domains. With over 30 years of experience, he's led MBSE standards work for Unified Profile for DoDAF, MODAF, and SysML v2, and is a recognized subject matter expert for systems engineering. He served as the architecture and design director within the Communications and Transportation Systems Engineering Center and represented the California Region as a member of the Architecture Review Board, supporting Raytheon's strategy to govern architecture deployment on programs and to train the next generation of resilient-systems architects. He also served as the MSI (Mission Systems Integration) Technology Area Director, where he led the initial concept development of the model based engineering initiatives for all of Raytheon.

Dr. Williamson has expertise in systems and software architecting, engineering, design, and implementation across the full systems lifecycle, including concept development, customer interaction, proposal development, requirements analysis, systems architecture and design, software architecture/design and integration, verification and validation.

Dr. Williamson received his PhD in computer science at USC and MS in applied mathematics from UCLA.

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