Model-Based Systems Engineering Certificate Program

2022—Open Enrollment Program

▶ **ctme.caltech.edu/mbse-open**

Virtual Learning: Live-Online
Format: 5-days, Remote, Instructor-Led
Upcoming Session: Saturdays, SEP 10–NOV 19, 2022
Timing: 7am–4pm PDT / 10am–7pm EDT

Program Objectives

When you are facing the challenge of optimizing design and simulation activities, you need the toolbox of relevant skills in *Model-Based Systems Engineering* (MBSE). A critical capability in digital engineering, MBSE integrates iterative, comprehensive design with insights into the implications of choices, changes, and system behaviors.

Our expert-led course in MBSE combines action learning and hands-on model making using real-world cases—the skillset to hit the ground running in deployments. This program elevates you and your team's capacity to create models that are both flexible and robust, boosting 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.

You will learn to:
- Explore MBSE in the context of Model Based Engineering (MBE) and complex systems
- Scope and execute full life cycle MBSE tasks
- Model systems through SysML and MBSE methods
- Model structures interactions, and behaviors based on requirements and constraints
- Investigate internal and external interactions

- Assess trades and implications
- Evaluate, critique, and improve SysML models
- Craft key representations, diagrams, and use-cases
- Build confidence in applying MBSE fundamentals to make meaningful contributions to your projects
- Articulate the economic and operational value of MBSE to stakeholders
- Plan appropriate approaches for implementation and accelerated adoption

Course sessions use Cameo Systems Modeler/No Magic from Dassault. Licenses can be provided.

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 gain an understanding of 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. 626.395.4045 execed@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.

Customization—We work with the client organization to understand your current challenges. Then, we integrate your specific context, cases, and methods with proven industry best-practices and insights to tailor the content to your needs.

Flexible formats allow us to deliver in the schedule most convenient for you. Programs can be delivered live at your locations in the US or Internationally. Many of our programs offer online formats, such as Live-Online or On-Demand. Unlike rigid term-based courses, Caltech's schedule flexibility is suited for busy professionals like you.

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 46 Nobel Prizes. The Institute manages the Jet Propulsion Laboratory (JPL) for NASA.

EDUCATORS

Michael Brenner is a Principal Systems Engineer at the Jet Propulsion Laboratory (JPL) where he is the product delivery manager for an advanced mirror development and imaging system. He has over 22 years of experience in the aerospace industry at JPL, supporting space imaging systems in the advanced instruments division.

Mr. Brenner has experience in system engineering, electronics design, optical system design, flight instrument integration and test, flight software development, ground support software development, product delivery management, and project management.

Mr. Brenner previously was the product delivery manager for advanced optical hardware and drive electronics for a flight demonstrator program. He was responsible for the architecture of a visible/NIR space telescope designed to directly image and spectrally characterize planets and disks around more than 100 of the nearest stars. Previously, he was the project systems engineer for the Advanced Mirror Development Project responsible for requirements development, ICD generation, Integrated Modeling, and project V&V process through completion. He served as project delivery manager for the Space Interferometer Mission (SIM) Instrument Electronics, responsible for design, fabrication, assembly and testing of flight electronics. Mr. Brenner was a JPL cognizant engineer for the Mid-infrared Instrument (MIRI) focal plane electronics on the James Webb Space Telescope (JWST), where he was in charge of the design, fabrication, control implementation, assembly and testing of the engineering model and flight hardware deliveries. Previously, Mr. Brenner was an electrical / system engineer for the Tropospheric Emission Spectrometer (TES), supporting the test and integration of the electronics and interfacing mechanisms, Instrument Ground Support Equipment (IGSE) Software, Flight Software, and Protoflight Environmental Acceptance Test execution.

Mr. Brenner received his MSEE with emphasis on digital system design and computer architecture from California State University, Northridge.

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