



Center for Technology &
Management Education

NGC Info Session

Mike Ash, Caltech CTME

29 August 2023

ctme.caltech.edu/ngc

Three things to know

What is Caltech CTME?

What makes us distinctive for our learners?

What are our NGC programs?

What is Caltech CTME

Caltech's Center for Technology and Management Education (CTME) is the ideal destination for systems leaders seeking professional development and transformational opportunities.



What makes us distinctive

Our people—and the way we shape programs and outcomes—is what makes a Caltech CTME program truly exceptional learning experiences for our individuals and their organizations.



**Instructors with
industry insight**



**Customizable
learning experiences**



**Ability to achieve
real impact**

NGC Programs: SE (1 of 5)

Airworthiness Fundamentals

Schedule

- TBD 2024

Program topics

- Introduction to Airworthiness
- Airworthiness Policies, Systems Engineering, and Air Vehicle Criteria
- Flight Technologies, Propulsion, and Air Vehicle Subsystems Criteria
- Crew Systems, Passenger Safety, and Electrical and Electronic Systems
- System Safety, Computer Systems, and Mission Equipment Criteria
- Sustainment and Continuing Airworthiness Processes

Format

- Live-Remote

NGC Programs: SE (2 of 5)

Systems Engineering Foundations (SE56 - AS)

Schedule	Program topics	Format
<ul style="list-style-type: none">• TBD 2024• Requires 84 hours of project time to be completed in addition to the 56-hour course	<ul style="list-style-type: none">• Introduction to Systems Engineering• Defining System Requirements• Functional Analysis• System Specifications• System Architecture• Decision Analysis• Design and Integration• Verification and Validation• Engineering Specialties• System Engineering Management• Technical Reviews and Audits• Risk Management• Quality Management• Creating a High-Performance Team• Minimizing and Resolving Team Conflicts	<ul style="list-style-type: none">• Live-Remote• Interactive team project work

NGC Programs: SE (3 of 5)

Systems Engineering Foundations (SE48 - SS/MS/DS)

Schedule	Program topics	Format
<ul style="list-style-type: none">Oct 13, 14, 27, 28 Nov 10, 11, 2023 8:00 AM - 5:00 PM MDTRequires 16 hours of project time to be completed in addition to the 48-hour course	<ul style="list-style-type: none">Introduction to Systems EngineeringDefining System RequirementsFunctional AnalysisSystem SpecificationsSystem ArchitectureDecision AnalysisDesign and IntegrationVerification and ValidationEngineering SpecialtiesSystem Engineering Management	<ul style="list-style-type: none">Live-RemoteInteractive team project work

NGC Programs: SE (4 of 5)

MBSE Fundamentals

MBSE Fundamentals (On-Demand)

MBSE Fundamentals

Schedule

- Oct 14, 15, 27, 28
Nov 10, 11, 2023
8:00 AM - 5:00 PM MDT

- Oct 16–Dec12, 2023
(Self-Paced)
8:00 AM - 5:00 PM MDT

- Oct 27, 28
Nov 10, 11
Dec 8, 9, 2023
8:00 AM - 5:00 PM MDT

Program topics

- MBSE - Why we do it
- Introduction to the NoMagic/Cameo interface
- How do we keep our workspace organized? - Package Diagrams
- How do our users interact with our system? - Use Case Diagrams
- What tasks does our system perform? - Activity Diagrams
- What does our system need to do and how well does it need to do it? - Requirements Diagrams
- What are the fundamental items in our system? - Block Definition Diagrams
- What is our system doing? - State Machine Diagrams
- How do our system's pieces interact? - Sequence Diagrams
- How are all the pieces connected? - Internal Block Diagrams
- What happens inside the blocks? - Parametric Diagrams

Format

- Live-Remote or On-Demand
- Interactive team project work

NGC Programs: SE (5 of 5)

Advanced MBSE

Schedule

- Oct 13, 14, 27, 28
Dec 8, 9, 2023
8:00 AM - 5:00 PM MDT

Program topics

- Identify model stakeholders (modeling our modeling effort)
- Generate custom documents and reports
- Evaluate considerations in developing model guidelines
- understand when and why to customize the language using stereotypes
- Identify opportunities for reuse and organize our models to support reuse
- Create and use libraries
- Perform trade studies in SysML
- Evaluate model behavior
- Design and simulate user interfaces
- Configure simulations
- Create a capstone model that combines all elements of the six-day certificate program and topics covered in Modules 1 and 2
- Apply core SysML concepts, simulations, and customizations to build an accurate representation of your system

Format

- Live-Remote

NGC Programs: PM (1 of 2)

Aerospace Project Management

Schedule	Program topics	Format
<ul style="list-style-type: none">• Sep 15, 16, 29, 30Oct 13, 14, 27, 28Nov 10, 11Dec 8, 9, 2023 <p>8:00 AM - 5:00 PM PDT</p>	<ul style="list-style-type: none">• Project Organization and Leadership• Project Costing and Proposal Development• Detailed Project Planning• Project Monitoring and Control• Project Risk Management• Supplier Performance Management	<ul style="list-style-type: none">• Live-Remote

NGC Programs: PM (2 of 2)

Agile Project Management

Schedule	Program topics	Format
<ul style="list-style-type: none">Oct 13, 27Nov 10Dec 8, 9, 2023 <p>8:00 AM - 5:00 PM MDT</p>	<ul style="list-style-type: none">Agile Methodologies and PracticesAgile Estimating and Requirements Gathering ProceduresAgile Design and Testing ProceduresAgile Release and Iteration Planning StrategiesAgile and Scrum Methodologies and PracticesAgile Leadership Styles for Agile ProjectsScaling Agile for Large Agile ProjectsAgile Implementation Strategies	<ul style="list-style-type: none">Live-Remote

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ctme.caltech.edu/ngc

Connect with an advisor:
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[SECTOR PROGRAMS](#)

[LINKS TO PROGRAM PAGES FOR LEARNING OBJECTIVES AND TOPICS](#)

[COURSE NUMBERS](#)

**Northrop
Grumman**



Caltech Training for Northrop Grumman Corporation

Since 2009, Northrop Grumman has partnered with Caltech's Center for Technology and Management Education for practical learning and leadership development for engineers and professionals alike.

Our programs are unique—we work closely with Northrop Grumman senior management to understand your current challenges and customize our course content to address them. Our instructors are practicing engineers and managers from industry, bringing their experience to bear in practical tools and methods you can apply directly to your job.

Discover What Caltech Has To Offer for Northrop Grumman

First Name:	<input type="text"/>
Last Name:	<input type="text"/>
Email Address:	<input type="text"/>
SIGN ME UP!	

Empowering Northrop Grumman

Caltech offers you the best programs and courses through our long-term partnership with the Northrop Grumman Corporation.

- **Customized Learning Programs**
Join your peers in exclusive courses tailored for NGC engineers and professionals.
- **Real World Instruction**
Learn from industry leaders with first-hand experience—many of who are NGC alumni.
- **NGC-Paid Tuition**
Receive maximum educational value—Use NGC EdAssist for tuition reimbursement.
- **Special Sector Programming**
Earn a certificate through a specialized program for your Sector.

Upcoming programs for all NGC organizations

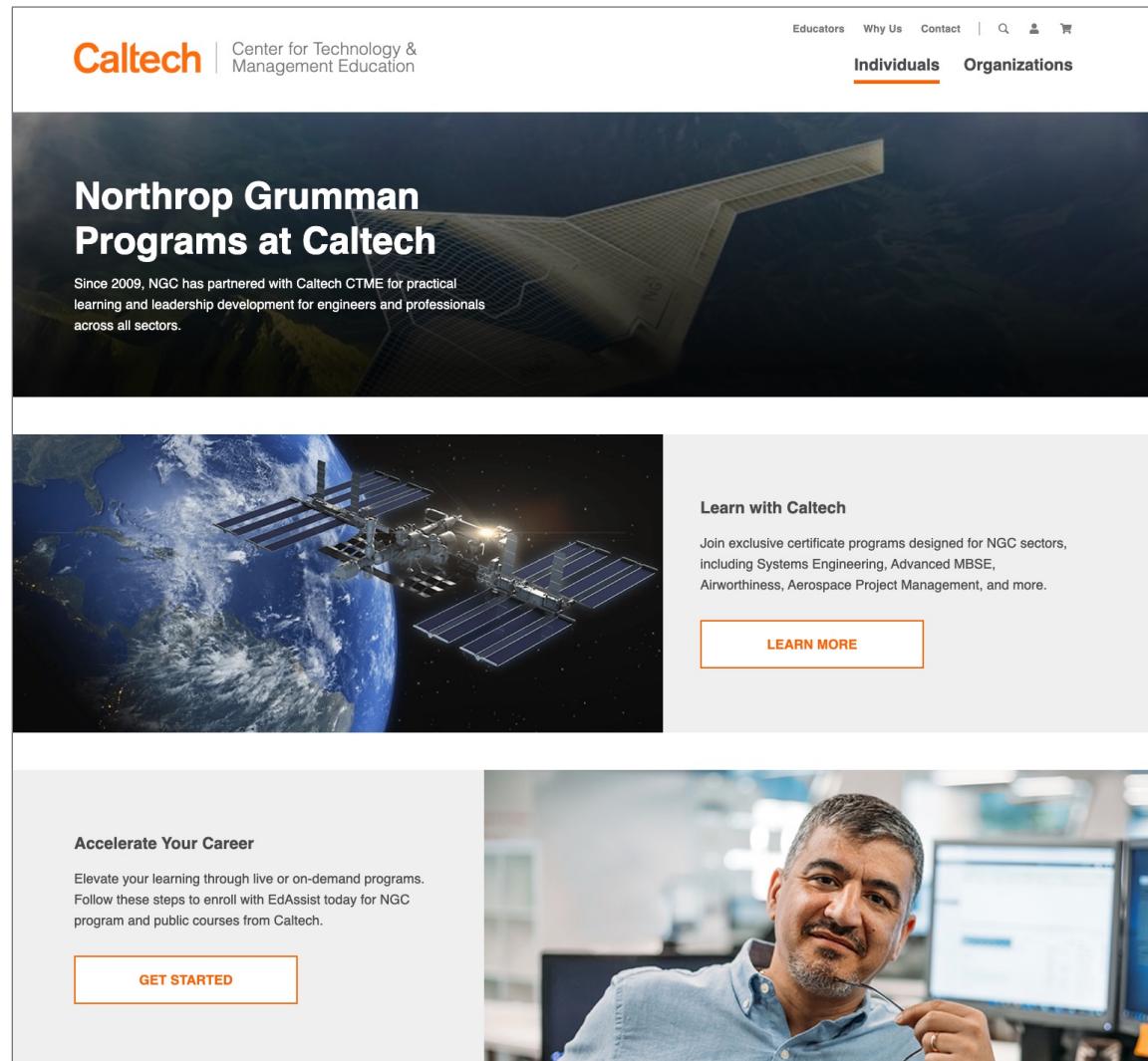
Refer to the course pages for details on objectives, topics, participant mix, and registration notes for tuition reimbursement. In addition, NGC Sectors may have specific instructions.

July - September

<p>Course Name: Aerospace Project Management Certificate Program 64 Course Code: 11407234 Credits: 9.6 CEU Location: Remote Live Course Alias: 5648191.0</p> <p>Course Name: NSGP: NGMS, NGDS Systems Engineering Foundations Certificate Program 65 Course Code: 36407234 Credits: 9.6 CEU Location: Remote Live For NGC Space Systems, Mission Systems, and Defense Systems. This program requires 16 hours of out-of-class time working on a team project.</p> <p>Course Name: Agile Project Management Certificate Program 18 Course Code: 18407234 Credits: 4.0 CEU Location: Remote Live Course Name: Agile Model-Based Systems Engineering Certificate Program 3 Course Code: 21608234 Credits: 4.8 CEU Location: Remote Live Course Name: Green/Hyperx Fundamentals Certificate Program 22 Course Code: 25008234 Credits: 6.4 CEU Location: Remote Live Course Name: Model-Based Systems Engineering Certificate Program 39 Course Code: 1658234 Credits: 4.8 CEU Location: Remote Live Course Name: NGIS Systems Engineering Fundamentals Certificate Program (SE36) 34 Course Alias: NGIS 4.8.0 Course Code: 15508234 Credits: 6.4 CEU Location: Remote Live For NGC Aero/Astro Systems sector employees only. This program requires 16 hours of out-of-class time working on a team project.</p> <p>Course Name: Model-Based Systems Engineering Certificate Program 91B Course Code: 16598234 Credits: 4.8 CEU Location: On-Demand</p> <p>Course Name: Aerospace Project Management Certificate Program 65 Course Code: 11409234 Credits: 9.6 CEU Location: Remote Live</p>	<p>July 7, 8, 21, 22 August 4, 5, 18, 19 September 15, 16, 29, 30 2023 8:00 AM - 5:00 PM Central Time</p> <p>July 21, 22 August 4, 5, 18, 19, 2023 8:00 AM - 5:00 PM Mountain Time</p> <p>July 21 August 4, 18, 29, 30, 2023 8:00 AM - 5:00 PM Mountain Time</p> <p>August 4, 5, 18, 19, 2023 8:00 AM - 5:00 PM Mountain Time</p> <p>August 18, 19 September 1, 16, 29, 30, October 13, 14, 2023 8:00 AM - 5:00 PM Central Time</p> <p>August 18, 19 September 1, 16, 29, 30, October 13, 14, 2023 8:00 AM - 5:00 PM Mountain Time</p> <p>August 18, 19 September 1, 16, 29, 30, October 13, 14, 2023 8:00 AM - 5:00 PM Central Time</p> <p>August 19 September 1, 16, 29, 30, October 13, 14, 2023 8:00 AM - 5:00 PM Mountain Time</p> <p>August 19, 2023 Work to be completed by October 15, 2023 On-Demand</p> <p>September 1, 16, 29, 30, October 13, 14, 2023 8:00 AM - 5:00 PM Pacific Time</p>	<p>Register SS, MS, DS</p> <p>Register AS</p>
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New website launching in early September

ctme.caltech.edu/ngc



The homepage features a large banner for "Northrop Grumman Programs at Caltech" with a background image of a satellite in space. Below the banner, there's a section titled "Learn with Caltech" showing a man in a lab, and another section titled "Accelerate Your Career" with a "GET STARTED" button.

Caltech | Center for Technology & Management Education

Educators Why Us Contact |

Individuals **Organizations**

Northrop Grumman Programs at Caltech

Since 2009, NGC has partnered with Caltech CTME for practical learning and leadership development for engineers and professionals across all sectors.

Learn with Caltech

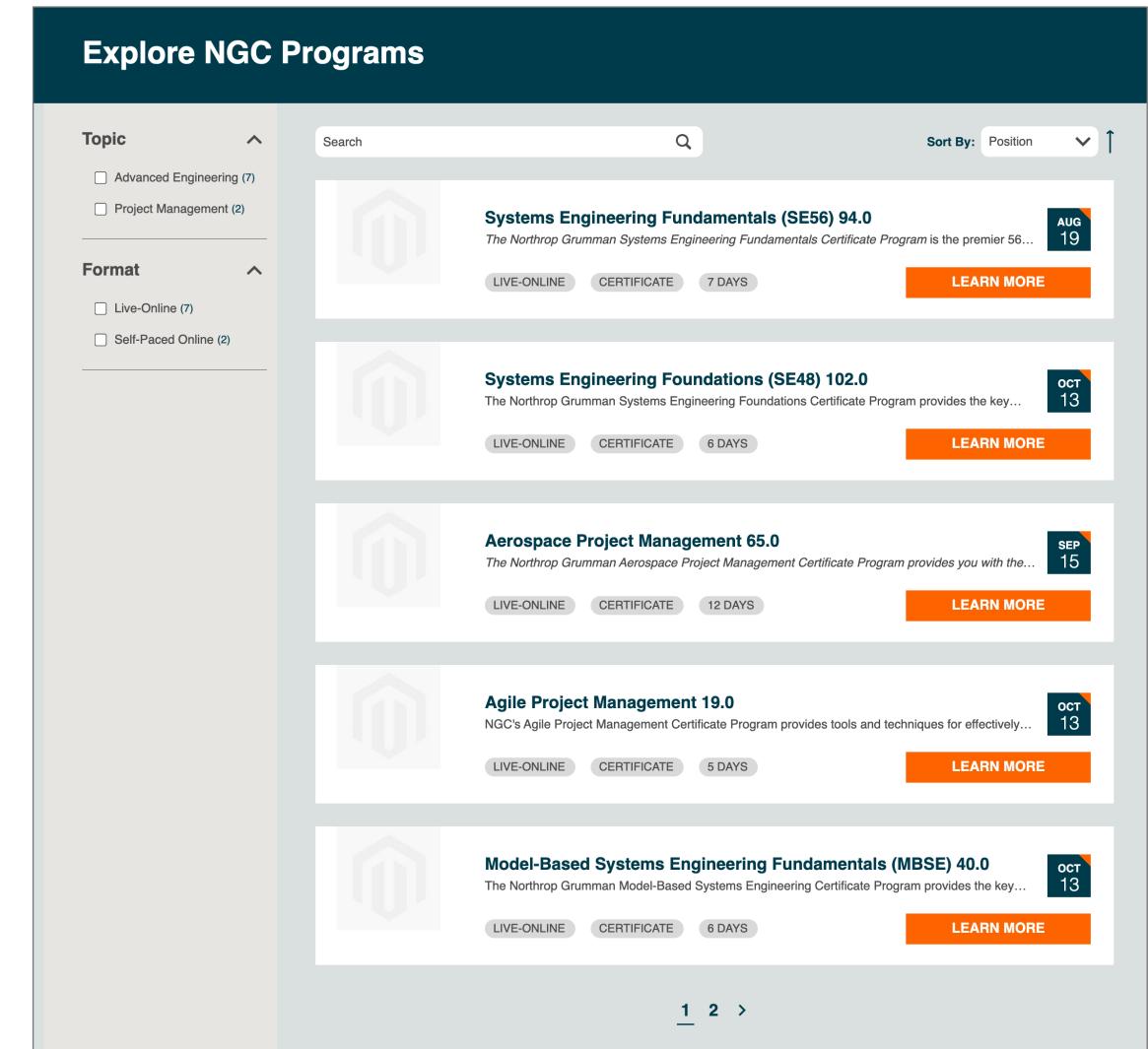
Join exclusive certificate programs designed for NGC sectors, including Systems Engineering, Advanced MBSE, Airworthiness, Aerospace Project Management, and more.

[LEARN MORE](#)

Accelerate Your Career

Elevate your learning through live or on-demand programs. Follow these steps to enroll with EdAssist today for NGC program and public courses from Caltech.

[GET STARTED](#)



Explore NGC Programs

Topic

Advanced Engineering (7)
 Project Management (2)

Format

Live-Online (7)
 Self-Paced Online (2)

Search Sort By: Position ↑

Systems Engineering Fundamentals (SE56) 94.0 AUG 19

The Northrop Grumman Systems Engineering Fundamentals Certificate Program is the premier 56...

[LEARN MORE](#)

Systems Engineering Foundations (SE48) 102.0 OCT 13

The Northrop Grumman Systems Engineering Foundations Certificate Program provides the key...

[LEARN MORE](#)

Aerospace Project Management 65.0 SEP 15

The Northrop Grumman Aerospace Project Management Certificate Program provides you with the...

[LEARN MORE](#)

Agile Project Management 19.0 OCT 13

NGC's Agile Project Management Certificate Program provides tools and techniques for effectively...

[LEARN MORE](#)

Model-Based Systems Engineering Fundamentals (MBSE) 40.0 OCT 13

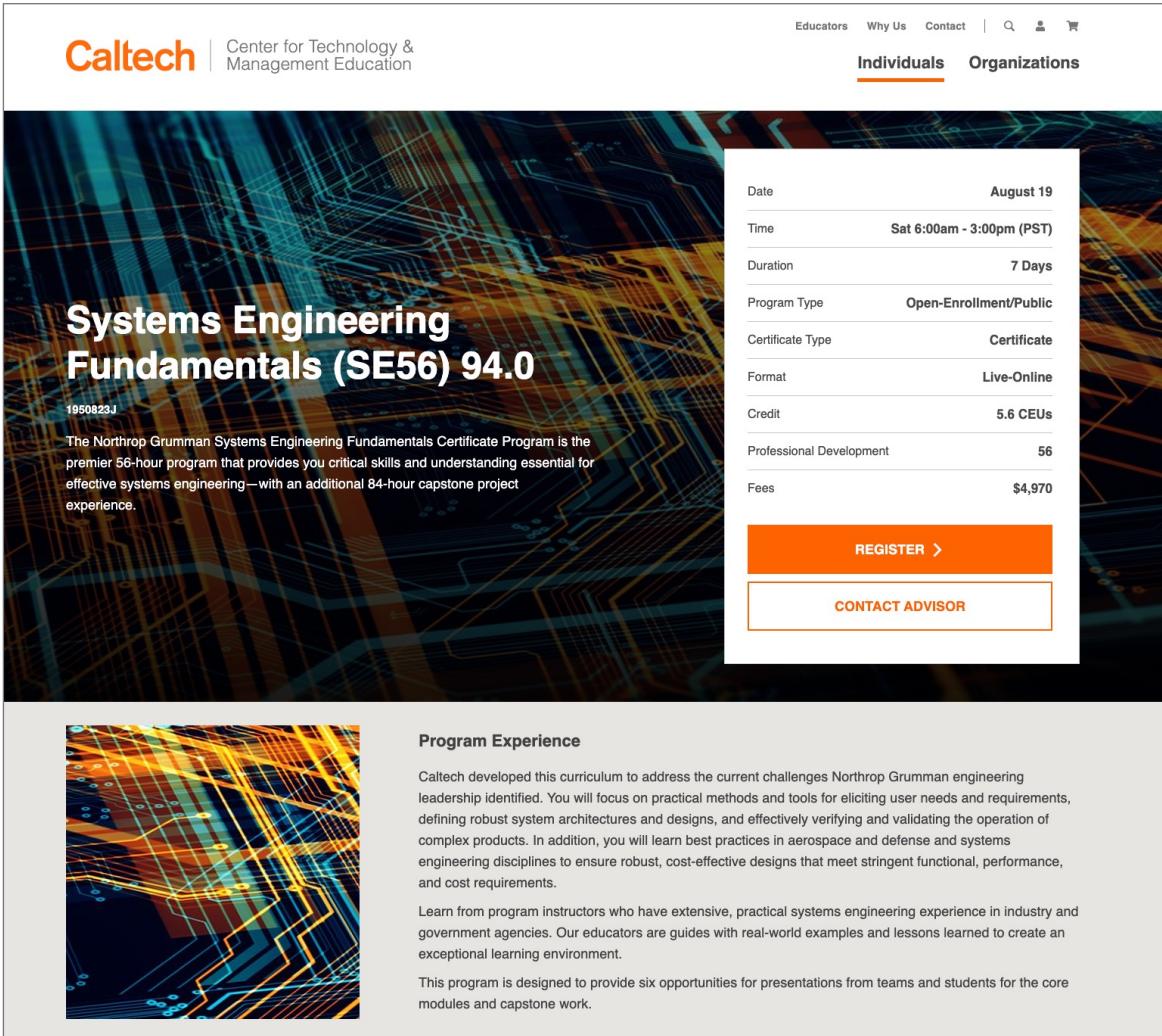
The Northrop Grumman Model-Based Systems Engineering Certificate Program provides the key...

[LEARN MORE](#)

1 2 >

New website launching in early September

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The screenshot shows the landing page for the Systems Engineering Fundamentals (SE56) 94.0 program. The page features a dark background with a glowing circuit board pattern. On the left, the program title "Systems Engineering Fundamentals (SE56) 94.0" is displayed in large white text, with the identifier "1950823J" below it. A descriptive text block explains the program's purpose: "The Northrop Grumman Systems Engineering Fundamentals Certificate Program is the premier 56-hour program that provides you critical skills and understanding essential for effective systems engineering—with an additional 84-hour capstone project experience." On the right, a white card provides detailed program information:

Date	August 19
Time	Sat 6:00am - 3:00pm (PST)
Duration	7 Days
Program Type	Open-Enrollment/Public
Certificate Type	Certificate
Format	Live-Online
Credit	5.6 CEUs
Professional Development	56
Fees	\$4,970

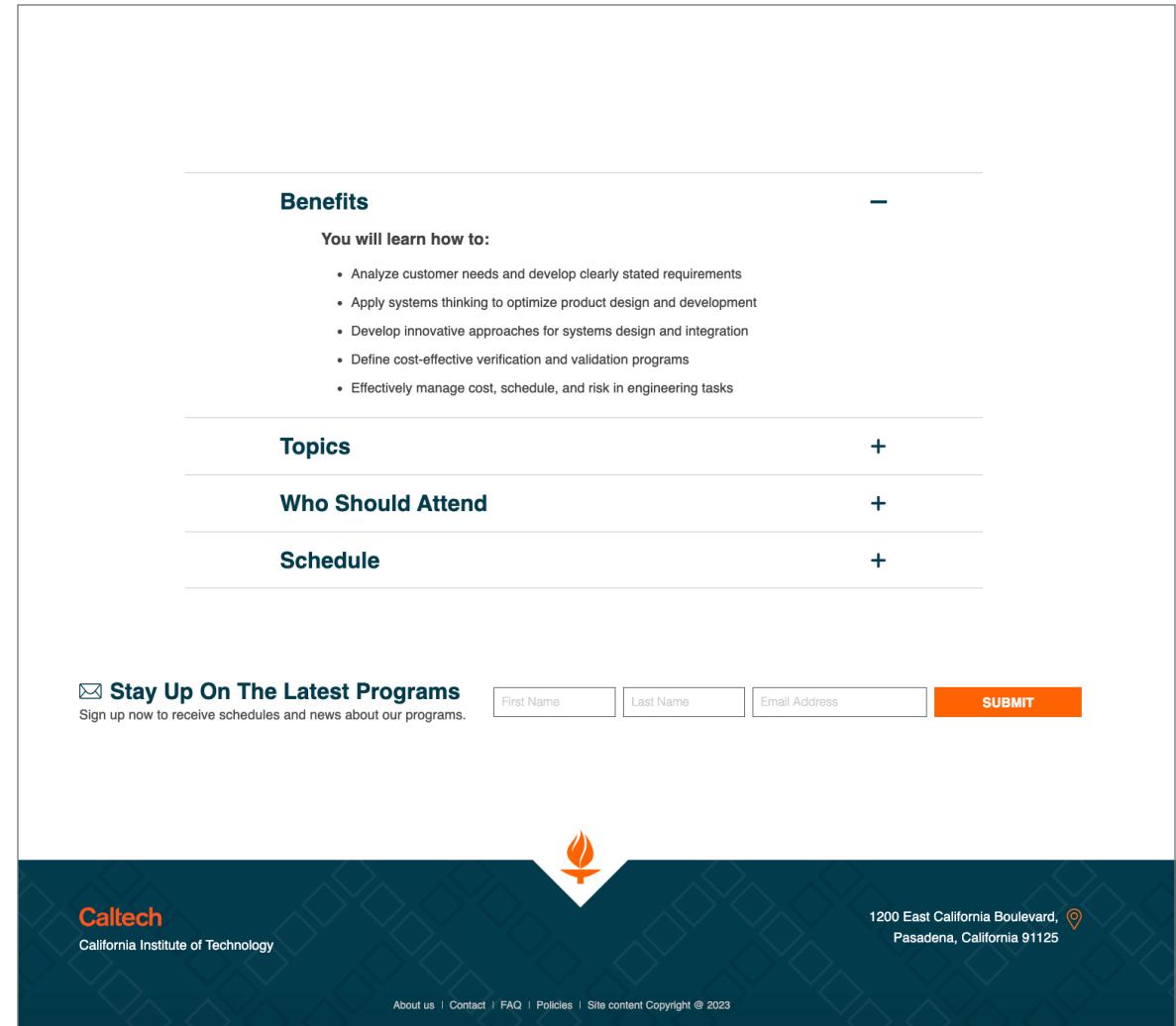
Below the card are two orange buttons: "REGISTER >" and "CONTACT ADVISOR".

Program Experience

Caltech developed this curriculum to address the current challenges Northrop Grumman engineering leadership identified. You will focus on practical methods and tools for eliciting user needs and requirements, defining robust system architectures and designs, and effectively verifying and validating the operation of complex products. In addition, you will learn best practices in aerospace and defense and systems engineering disciplines to ensure robust, cost-effective designs that meet stringent functional, performance, and cost requirements.

Learn from program instructors who have extensive, practical systems engineering experience in industry and government agencies. Our educators are guides with real-world examples and lessons learned to create an exceptional learning environment.

This program is designed to provide six opportunities for presentations from teams and students for the core modules and capstone work.



The screenshot shows a program details page. At the top, there are tabs for "Individuals" and "Organizations".

Benefits

You will learn how to:

- Analyze customer needs and develop clearly stated requirements
- Apply systems thinking to optimize product design and development
- Develop innovative approaches for systems design and integration
- Define cost-effective verification and validation programs
- Effectively manage cost, schedule, and risk in engineering tasks

Topics

Who Should Attend

Schedule

Stay Up On The Latest Programs

Sign up now to receive schedules and news about our programs.

First Name Last Name Email Address

Caltech
California Institute of Technology

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Q&A





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