AI/ML Lab for Engineering & Science

Certificate Program

Enroll Now:

- **Live-Online / On-Demand Formats**
- **CEUs / PDUs Available**
- **Employer Tuition Benefits Accepted**

ctme.caltech.edu/ailabensc-open

Program Objectives

Welcome to Caltech's AI/ML Lab for Engineering and Science, where we propel your machine learning skills to new heights for industry-grade applications in both research and real-world product environments. Our intensive, hands-on five-day certificate program is designed to hone your expertise based on the Institute's proven methodology for nurturing researchers' skills.

In this live online program, you will delve into the foundations of machine learning algorithms, gaining a deep understanding of data preprocessing, model selection, and evaluation criteria. Through diverse use cases, we will guide you along the entire AI/ML lifecycle, arming you with a potent toolkit to conquer industry challenges with confidence.

Learning Objectives

Our aim is to provide you with practical, applied machine learning techniques that you can implement immediately. While we will touch upon the statistical foundations of modern ML, our primary focus will be on equipping you as a real-life industry practitioner in engineering and research domains.

This course is designed for technically adept learners who wish to gain a comprehensive understanding of the entire AI/ML lifecycle, exploring the intricate trade-offs between commercial demands and academic pursuit of algorithm development. Enroll now to unlock your full potential in the realm of AI.

You will learn how to:

- Understand industry applications of the end-to-end AI/ML lifecycle
- Complete the foundations of ML with analytical methods and statistical deep dives
- Preprocess data to fit the needs of modern ML algorithms
- Understand the entire AI/ML lifecycle and its applications
- Create robust modeling of supervised and unsupervised algorithms
- Know which algorithm to select for various real-world scenarios in engineering and science
- Approach deep learning with applied knowledge of neural networks
- Leverage deep learning methods using modern tools like PyTorch
- Know the differences in compute when using deep learning
- Apply foundational large language models (LLMs) to current use cases in engineering and science

Caltech Center for Technology & Management Education

Participants

This program is designed for experienced professionals with a background in engineering, science, or related fields such as aerospace, chemistry, biology, electronics, finance, communications, or technology. It is ideal for those who want to integrate data science and machine learning into their work. Learners are expected to have a solid understanding of calculus, linear algebra, probability, and statistics, as well as basic programming skills, including Python/R. The course provides a balanced combination of theoretical concepts and practical applications.

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—Our instructors bring decades of real-world expertise and leadership in engineering, commercialization, manufacturing, operations, innovation management and executive accountability within technology-driven organizations and government agencies.

Achieve real impact in our on-demand classes with Caltech's action learning approach. Our module exercises, relevant cases, and structured reinforcement learning empowers you to apply new knowledge and thrive in the face of new challenges.

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Instructor

Nicholas Beaudoin works at the intersection of machine learning and strategic decision-making in public and commercial organizations. As a data science manager with large and small consulting firms, including Deloitte, Capgemini, Eviden, and Washington, DC, analytic/policy think tanks, he developed AI/ML solutions, methods, data pipelines, and data visualization. His experience comes from helping companies ideate, build, and deploy machine learning solutions, including the infrastructure to support them. He has helped numerous Fortune 500 companies such as Mercedes-Benz, Honda, Warner Bros., Disney, Estée Lauder, national insurance providers, and various federal government departments ranging from the Department of Defense to the Department of State and Department of Agriculture.

Mr. Beaudoin holds extensive knowledge spanning AI/ML production, including end-to-end machine learning lifecycles, deployment strategies, and cloud-based integrations on AWS, GCP, and Azure. He is experienced in DevOps best practices for machine learning and proficient in MLOps orchestration and management. Additionally, he has expertise in applied generative AI, specifically large language models (LLMs), and is familiar with machine learning open-source toolkits.

Mr. Beaudoin is an instructor for Caltech CTME's programs, where he teaches machine learning, machine learning operations (MLOps), generative AI, and cloud-based machine learning. Mr. Beaudoin holds a Master's degree in International Affairs, with a focus on International Economics and Econometric Modelling, from UC San Diego and a Bachelor's degree in Political Science from Lewis & Clark College. In addition, he holds numerous advanced certifications in AWS and Google Cloud services.

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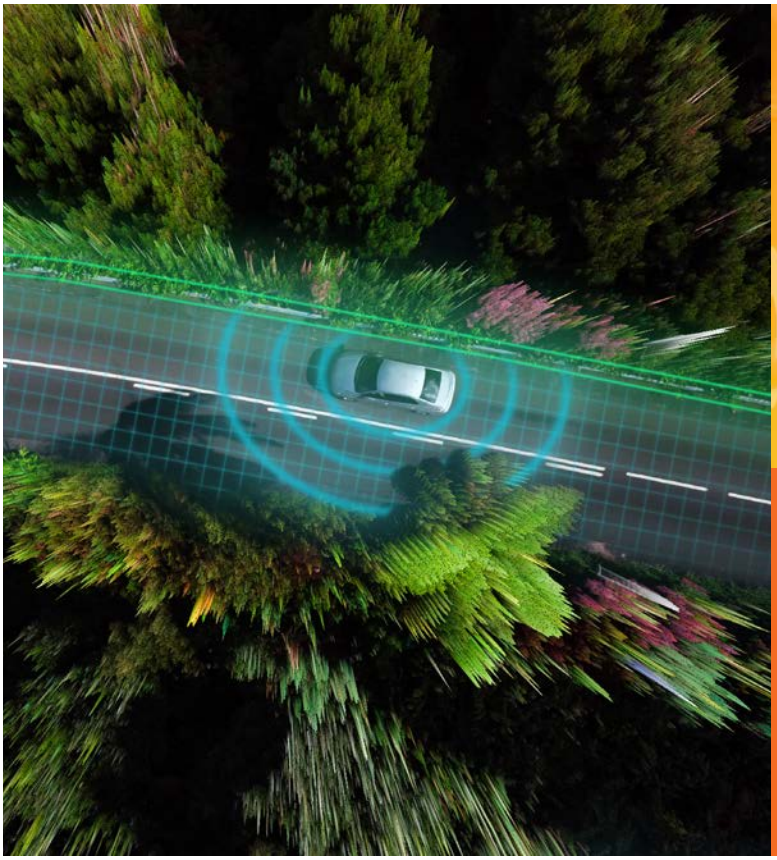

Industrial DevOps

Certificate Program

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ctme.caltech.edu/ido

Program Objectives

The Caltech Industrial DevOps certificate provides you with the critical skills and knowledge essential for leaders to adopt DevOps practices for cyber-physical domains, integrating software development and hardware engineering for complex systems.

Learn key concepts and principles of digital/agile engineering processes, tools, and operating models. This expert-led course covers practical leading practices that you can successfully apply immediately.

This 40-hour certificate program focuses on adopting Agile/DevOps ways of working, bridging the gap between software engineering and systems engineering, and successfully building cyber-physical systems with speed and quality to stay ahead of your competition.

Learning Objectives

Join our interactive learning environment in this live, instructor-led program, comprising essential topics such as understanding the reasons we must change how we work and the benefits of adopting Industrial DevOps in your organization.

Understand nine key principles, explore the underlying concepts and how they are applied to various domains.

In this course we'll delve into case studies of companies who are adopting these leading approaches, while providing practical coaching tips and take-aways.

You will learn how to:

- Communicate the value of iterative and incremental product development approach
- Explain the benefits of a DevOps culture and how it supports agility
- Discuss and share the key concepts and principles of DevOps
- Plan, assess, and execute traditional and Agile-centric technical projects
- Develop and apply Value Stream Mapping technique for process optimization
- Apply metrics to DevOps transformations
- Explain the DevOps lifecycle and application of tools
- Plan application of the concept of DevOps beyond software to encompass systems engineering principles
- Maximize cross-disciplinary collaboration between software developers, systems engineers, and operational teams

Caltech Center for Technology & Management Education

Participants

This course is designed for early-to-mid career professionals with a technical/STEM background who seek to understand the fundamentals of DevOps concepts and practices. In addition, this course is suited for professionals who plan to deploy transformative DevOps initiatives in complex organizations, maximize flexibility and deliver prompt, value-added results.

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Instructors

Eugene Lai is an innovator in Information Technology and process engineering with over 20 years of experience in leading DevOps teams. He has served as Lead Software Engineer, Chief Scrum Master, Chief Product Owner, Principal Program Manager, Technical Consultant and Agile Coach/Trainer. Mr. Lai has orchestrated SDLC and Agile Engineering initiatives by applying a variety of methodologies including traditional Waterfall, Scaled Agile Framework (SAFe) and Scrum.

Mr. Lai has successfully applied process lifecycle frameworks and delivered complex solutions to numerous Fortune 500 and U.S. Department of Defense customers, including Encore Capital Group, FICO, InnovaSystems, 3E Company, GDIT/CSRA/CSC, Safety-Kleen, EDF Renewable Energy, U.S. Navy & DHS, and ASPE/cPrime. He has also worked with Project Management Institute (PMI), Scrum Alliance, Agile Alliance, and Scaled Agile Inc.

Mr. Lai holds several DevOps-related credentials including Certified Scrum Master, Certified Scrum Professional, Certified DevOps Practitioner, Agile Certified Practitioner, Scaled Agile Program Consultant, Project Management Professional and Program Management Professional.

Mr. Lai holds an MBA from Baker College and a BS in Mechanical Engineering from University of California Los Angeles.

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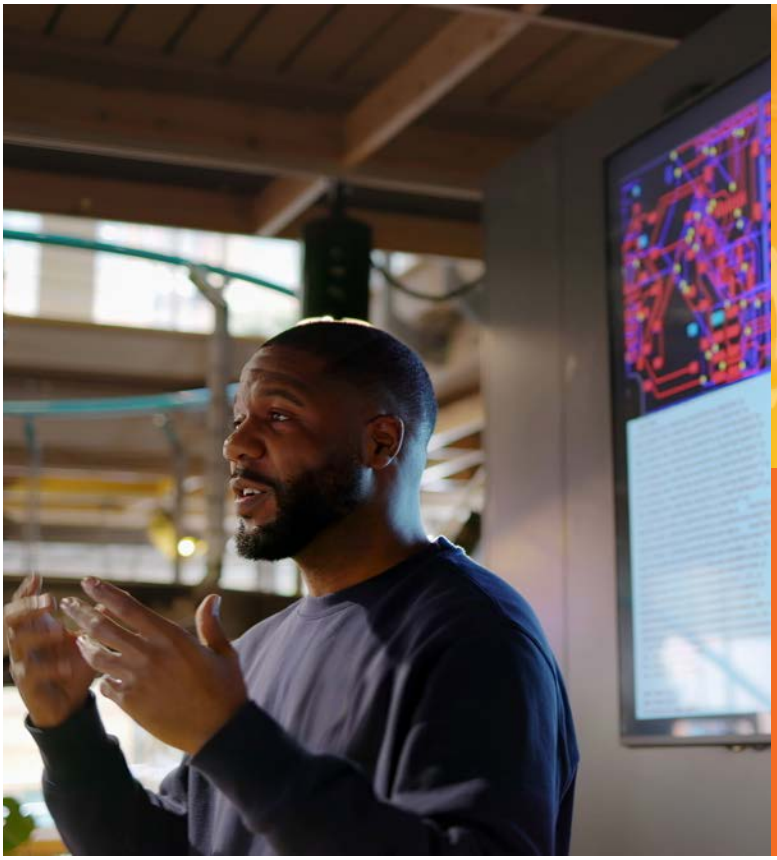

Reinventing Work for the Age of AI

Customizable Program

Enterprise & Group Programs:

- **Caltech Certificate Available**
- **Available On-Campus, Onsite, Online**
- **Tailored Workshops and Activities**
- **Employer Tuition Benefits Accepted**

ctme.caltech.edu/reinvent-work

Program Objectives

This executive workshop program is a high-energy, practical learning experience that provides you and your senior team with the insights, frameworks, and tools to truly understand AI and how to incorporate it into the work of your organization.

Learn about the various categories of automation, experiment with emerging AI tools, including generative AI, and understand how to use award-winning frameworks to redesign work that achieves the optimal combinations of humans and automation.

Learning Objectives

Through small group exercises, lectures, and hands-on applications, senior leaders gain insights into the potential of AI and machine learning. This program provides a comprehensive understanding of these technologies and how to apply them effectively in organizations. By familiarizing leaders with intricacies and possibilities, we empower them to make informed decisions and drive innovation. Our methods and frameworks are derived from best practices and are proven to steer strategic decision-making.

You will learn how to:

- Understand the rapidly evolving landscape of AI/ML and enabling technologies and their impact on organization capabilities, competitiveness, and ability to attract talent
- Explore generative AI tools to solve challenges in hands-on exercises
- Use the Reinventing Jobs framework to analyze business processes and evaluate AI and automation opportunities
- Apply the right frameworks pivotal to redesigning work for agility and sustainability
- Explore when and how to incorporate AI into work, and examine the tradeoffs and risks
- Understand how to experiment with and introduce new work operating models
- Develop business cases and quantify ROI estimates to size transformation opportunities
- Connect talent to value-transforming work
- Lead in the age of AI through new mindsets, skills, and behaviors
- Cascade learnings through your organization to embrace new models for talent and work

Caltech Center for Technology & Management Education

Participants

This program is specifically designed for executives and senior leaders, including general managers, HR leaders, technology leaders, innovation officers, and change management professionals, who are interested in harnessing the power of artificial intelligence to drive transformation in their organizations.

This program can be tailored for cascading from corporate to individual divisions and departments for focusing on local business challenges, and opportunities for employee talent, technologies, and leadership.

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Instructor

Ravin Jesuthasan is the global leader of Mercer's Transformation Services business. He is a recognized global thought leader, futurist, and bestselling author on the future of work and workforce transformation. He works with some of the largest, most sophisticated organizations in the world on the transformation of work and the workforce. He has led multiple research efforts on the global workforce, the rise of artificial intelligence, and the transformation of work. Ravin has led numerous research projects for the World Economic Forum including many of its ground-breaking studies on the transformation of work and the global workforce. He is a regular participant and presenter at the World Economic Forum's annual meeting in Davos and is a member of the forum's Steering Committee on Work and Employment.

Ravin has been a featured speaker on the aforementioned topics at conferences in North America, Europe, Asia Pacific, the Middle East, and Latin America. He has also been featured and quoted extensively by leading business media including CNN, BBC, The Wall Street Journal, CNBC, Fortune, FT, The Nikkei (Japan), and Dubai One TV among others. Ravin was also an advisor to and featured prominently on PBS's widely acclaimed documentary series *The Future of Work.* Ravin is a frequent guest lecturer at universities around the world including Caltech, Oxford University, Northwestern University, New York University, and the University of Southern California. Ravin is a facilitator of the executive education programs at Caltech.

Ravin was named to the Thinkers 50 Radar Class of 2020. He has also been recognized as one of the top 25 most influential consultants in the world by Consulting Magazine, one of the top 8 future of work influencers by Tech News, and one of the top 100 HR influencers by HR Executive. He is the author of the books *Transformative HR* (Wiley, 2012)*, Lead the Work: Navigating a World Beyond Employment* (Wiley 2015), *Reinventing Jobs: A 4-Step Approach to Applying Automation to Work* (HBR Press, 2018)*, and the Wall Street Journal and Amazon bestseller; Work Without Jobs: How to Reboot Your Organization's Work Operating System* (MIT Press, 2022). Ravin has authored over 200 articles including 15 for the Harvard Business Review and the Sloan Management Review.

Ravin holds a BBA (with high honors) in Finance and Commercial Law and an MBA (with high honors) in Finance. He is a Chartered Financial Analyst (CFA®) and a member of the CFA Institute. Ravin is a Fellow of the RSA (Royal Society for the encouragement of Arts, Manufactures, and Commerce). Prior to joining Mercer, Ravin was a managing director and global business leader at Willis Towers Watson for over 26 years and a consultant with Accenture's strategy consulting practice.

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Advanced Model-Based Systems Engineering

Certificate Program

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- **CEUs / PDUs Available**
- **Employer Tuition Benefits Accepted**

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Program Objectives

Gain valuable expertise and level up your skills with Caltech's Advanced Model-Based System Engineering Certificate Program (Advanced MBSE). Dive into the full power of SysML in practical examples of intricate systems and digital threads. Benefit from engaging, self-paced learning guided by an accessible expert instructor as you work through real-world scenarios. Build the confidence to deploy MBSE/SysML on your projects in a manner that adds value and encourages robust systems thinking.

Advanced MBSE is a comprehensive continuation of Caltech's MBSE Fundamentals course. Using a real-world practical example, you will dive into applying the full construct of SysML elements in the nine SysML diagrams. We cover the requirements for OMG SysML certification exams.

Learning Objectives

Access pre-recorded videos, get hands-on training with Dassault Magic System, and use asynchronous instructor support. Apply MBSE in a class project and complete assignments to deepen your understanding.

You will learn how to:

- Embrace the significance and value of digital engineering, gaining valuable insights into cultivating a team that can excel in model-based methods and standards
- Apply cross-diagram application of SysML elements effectively
- Use simulation capability across diagrams to its fullest potential
- Establish and enforce systems and model guidelines, stereotypes, and standards within your team
- Gain a comprehensive understanding of SysML elements in all nine SysML diagrams
- Seamlessly integrate SysML with other languages and standards, such as UAF and DODAF/TOGAF
- Evaluate the quality of models from team members, customers, 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
- Create a plan for successful implementation and adoption

Caltech Center for Technology & Management Education

Participants

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 proficiencies needed for OMG certifications for SysML (Level 3–4).

Pre-requisite: Caltech's MBSE Fundamentals course or equivalent course/hands-on experience. You must understand the notation for all nine SysML diagrams and be able to create them with Cameo Systems Modeler.

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Instructor

Michael Brenner, is a Principal Systems Engineer at the Jet Propulsion Laboratory (JPL), which Caltech manages for NASA, 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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Model-Based Systems Engineering Fundamentals

Certificate Program

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- **CEUs / PDUs Available**
- **Employer Tuition Benefits Accepted**

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Program Objectives

Mastering Model-Based Systems Engineering (MBSE) is essential for optimizing design and simulation activities. It equips you with the necessary skills to navigate the complex challenges of digital engineering. With MBSE, you can seamlessly integrate design iterations and gain valuable insights into the implications of your choices, changes, and system behaviors.

Our expert-led MBSE course offers a unique blend of hands-on model making and action learning. Through real-world case studies, we empower you and your team to hit the ground running in real-world deployments. With our program, you'll enhance your ability to create flexible and robust models, ultimately boosting your organization's capability to deliver expected value.

Learning Objectives

Learn how to apply systems thinking to the engineering process in just five days. This program covers everything from gathering customer needs to integrated design and delivery. Get practical experience with interactive SysML models using Cameo Systems Modeler or similar Dassault tools.

You will learn how to:

- Discover MBSE within the context of Model-Based Engineering (MBE) and complex systems
- Efficiently carry out the entire life cycle of MBSE tasks
- Create models of systems using SysML and MBSE methodologies
- Design structures, interactions, and behaviors that meet requirements and constraints
- Examine both internal and external interactions
- Analyze and consider different options and their consequences
- Evaluate, analyze, and enhance SysML models
- Develop important representations, diagrams, and use-cases
- Gain confidence in applying MBSE principles to effectively contribute to your projects
- Clearly communicate the economic and operational value of MBSE models and practices to stakeholders
- Create a plan for successful implementation and adoption

Caltech Center for Technology & Management Education

Participants

This program is designed for professionals in aerospace, defense, electronics, mobility, and advanced medical devices who work in systems engineering. Engineers, analysts, designers, and developers at all career levels will learn a structured approach to requirements analysis and systems design, as well as ways to improve their planning, execution, and communication skills.

Project managers and support teams will explore how MBSE disciplines can enhance mission effectiveness and agile-like program delivery through iterative simulations.

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Systems Engineering Fundamentals

Certificate Program

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Program Objectives

Acquire vital skills and knowledge in Systems Engineering through Caltech's Certificate Program. Our practical course, spanning 40 hours, will equip you with the ability to identify user needs and requirements, develop strong system designs, and effectively verify and validate cyber-physical products. Learn from industry experts and engage in hands-on activities using real-world cases.

Develop the confidence and expertise to successfully tackle intricate, cross-functional projects using cutting-edge tools and techniques. Learn valuable insights from industry-leading instructors in aerospace, agriculture, defense, electronics, energy, and heavy industry sectors.

Learning Objectives

Our 40-hour program aims to enhance your systems thinking perspective throughout the engineering process, covering everything from gathering customer needs and requirements to systems design and integrated verification and validation. Additionally, you will learn the topics and approaches necessary for the INCOSE CSEP.

You will learn how to:

- Conduct mission analysis and articulate a Concept of Operations
- Assess requirements through Context Diagrams, Functional Block Diagrams, and Design Structure Matrices (DSM)
- Architect systems, sub-systems, interfaces and interactions, hierarchies and hand-offs
- Evolve innovative design approaches for performance, trade-offs, and managing change
- Engineer for specialized outcomes, Design for Manufacturing, Design-to-Cost, Maintainability
- Define cost-effective verification and validation plans
- Effectively manage cost, schedule, risk, and accountability in engineering tasks and digital methods
- Plan, assess, and control traditional and Agile-driven technical programs spanning hardware and software
- Examine Model-Based Systems Engineering (MBSE) methods and approaches that use SysML

Caltech Center for Technology & Management Education

Participants

This program is perfect for aerospace, defense, electronics, automotive/mobility, medical device professionals, and project managers in connected infrastructure for smart cities and environments. It caters to both seasoned and junior engineers, analysts, designers, and developers who want to advance their skills and knowledge in the industry. Systems Engineering Fundamentals is also an ideal prerequisite for professionals employing digital engineering model-based techniques. Regardless of your experience level, this course offers valuable insights and techniques to help you succeed in your career.

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Instructors

Ken Preston, DBA, has over 30 years of aerospace and defense experience with over 25 years in project management. As a lead for the Boeing C-17 Program, he has technical oversight of the parts management/obsolescence function and predictive obsolescence analytics. Dr. Preston was an engineering project manager of special projects in the Design Integration Office and project manager for supplier diversity.

Dr. Preston was selected Manager of the Year by the National Management Association (NMA) Southern California Area Council. He is a recipient of the NASA/American Society for Engineering Education Faculty Fellowship Program via Langley Air Force Base and served on the faculty at Hampton University. Dr. Preston received his DBA in business administration and MBA in project management from Columbia Southern University.

Rick Hefner, PhD, is currently the executive director for Caltech's Center for Technology and Management Education, where he designs and develops learning programs for technology-driven organizations. He has over 40 years of experience in systems engineering, project management, and corporate management.

Dr. Hefner has also worked with companies in the aerospace, communications, electronics, and health sciences industries, including Aerospace Corporation, AeroVironment, Applied Physics Laboratory, Applied Materials, Ares Management, Boeing, DRS Technologies, Halliburton, Honeywell, Jet Propulsion Laboratory (JPL), John Deere, L3Harris Technologies, Maytag, Motorola, Northrop Grumman, AT&T, Raytheon, Schlumberger, Southern California Edison, St. Jude Medical, Toshiba, U.S. Navy, and Xerox.

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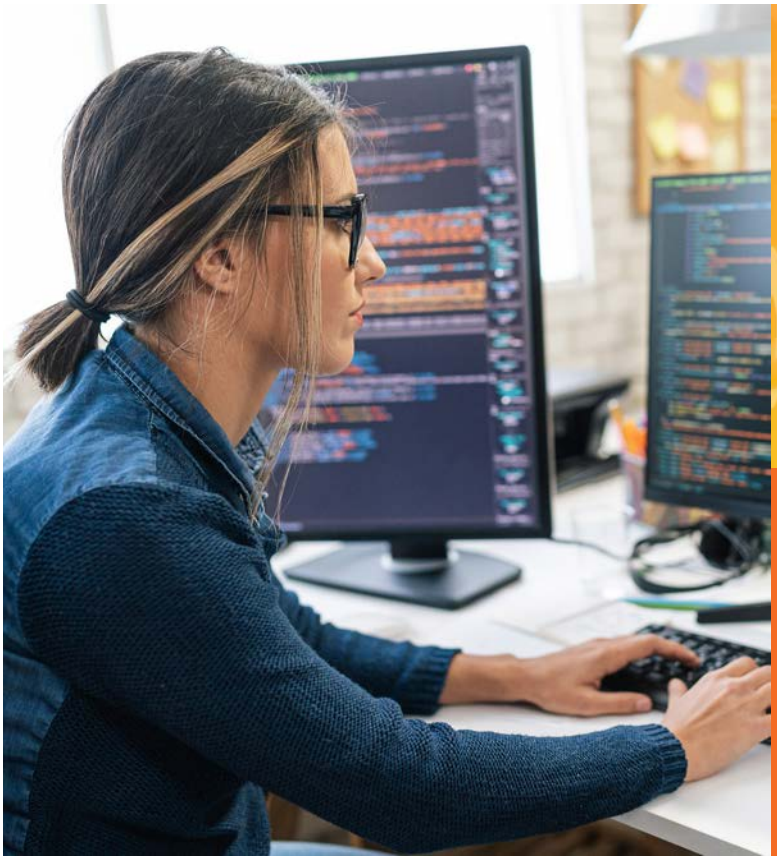

Artificial Intelligence Academy

Customizable Certificate Program

Enterprise & Group Programs:

- **Caltech Certificate**
- **Available On-Campus, Onsite, Online**
- **Tailored for Skill Objectives** (Executive, Advanced, Intermediate)
- **Employer Tuition Benefits Accepted**

ctme.caltech.edu/ai-academy-custom

Program Objectives

Elevate your team's technical expertise with our customizable AI/Machine Learning group training at Caltech. Harness hands-on AI/ML skills, industry-driven applications, and expert-led insights to transform your organization and its performance.

Experience an immersive AI learning journey at Caltech, designed for your teams of data scientists, developers, and engineers. Your teams will engage with our expert instructors through interactive lectures and hands-on ML projects on a user-friendly platform. Explore targeted machine learning solutions in industries like biotech, energy, finance, and aerospace, culminating in a capstone project using real-world or synthetic data.

Learning Objectives

This program is available in different lengths, from 1 to 4 weeks, depending on the depth and breadth desired. The program can be provided at your location, or on the Caltech campus in Pasadena, California. Campus classes include faculty interactions and visits to on-campus research labs and the Jet Propulsion Lab (JPL), which Caltech manages for NASA.

Employees return to your organizations charged and ready to lead innovation. AI Academy can be configured for non-technical participants, such as product management teams.

You will learn how to:

- Understand Master core AI and ML principles and powerful start-of-the art techniques for analyzing data and empowering AI products
- Align business objectives with data science capabilities to enhance decision-making and infrastructure
- Develop comprehensive ML solutions with a focus on efficiency and effectiveness in industrial contexts
- Implement advanced optimization methods for dynamic system performance and industry-specific problem solving
- Gain hands-on experience with ML applications in finance, supply chain, and sustainable energy, tackling real-world problems like credit default prediction and climate action
- Dive into Hybrid AI and knowledge-based operations to drive innovation and strategic operational decisions
- Acquire practical skills in Python for ML development, data manipulation, and ETL processes
- Adopt best practices in ML operations, model governance, and bias mitigation to ensure ethical and transparent AI deployment

Caltech Center for Technology & Management Education

Participants

This program is designed for experienced professionals with a background in engineering, science, or related fields such as aerospace, chemistry, biology, electronics, finance, communications, or technology. It is ideal for those who want to integrate data science and machine learning into their work. Learners are expected to have a solid understanding of calculus, linear algebra, probability, and statistics, as well as basic programming skills, including Python/R. The course provides a balanced combination of theoretical concepts and practical applications.

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—Our instructors bring decades of real-world expertise and leadership in engineering, commercialization, manufacturing, operations, innovation management and executive accountability within technology-driven organizations and government agencies.

Achieve real impact in our on-demand classes with Caltech's action learning approach. Our module exercises, relevant cases, and structured reinforcement learning empowers you to apply new knowledge and thrive in the face of new challenges.

Discover the freedom to learn your way with our flexible programs. Whether you prefer online classes, on-campus or international experiences, or self-paced learning, we have options for you. With frequent course offerings, you can easily fit your education into your busy schedule.

Take on the challenge with Caltech. Earn a distinguished certificate by completing full programs (40+ hours) or choose targeted learning for your objectives and career. Gain credit for continuing education and professional development.

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Instructors

Zehra Cataltepe, PhD, is the CEO and co-founder of TAZI.AI with over 30 years of experience in machine learning. A Caltech alumna (PhD, MS), she has 18 patents, 100+ publications, and is a 3X Women Entrepreneur of the Year. She leads our custom AI Academy programs for government and industry.

Issa A.D. Nesnas, PhD, is a principal robotics technologist at the Jet Propulsion Laboratory and associate director at Caltech's Center for Autonomous Systems and Technologies. He is also the JPL lead on NASA's Autonomous Systems Capability Leadership Team. Issa served as the supervisor for the Robotic Mobility Group, which led the development of the autonomous surface navigation for the Perseverance rover. He led research in architecting autonomous systems as well as in-space navigation for approaching small bodies. Issa received a BE degree in Electrical Engineering from Manhattan College, NY. He earned the MS and PhD degrees in Mechanical Engineering from the University of Notre Dame, IN.

Nicholas Beaudoin works at the intersection of machine learning and strategic decision-making in public and commercial organizations. As a data science manager with consulting firms, including Deloitte, Capgemini, Eviden, and Washington, DC, analytic/policy think tanks, he developed AI/ML solutions, methods, data pipelines, and data visualization. His clients include Mercedes-Benz, Disney, and various federal government departments, such as the Department of Defense and the Department of State

Mr. Beaudoin holds extensive knowledge spanning AI/ML production, including end-to-end machine learning lifecycles, deployment strategies, and cloud-based integrations on AWS, GCP, and Azure. He is experienced in DevOps best practices for machine learning and proficient in MLOps orchestration and management. Additionally, he has expertise in applied generative AI, large language models (LLMs), and open-source toolkits.

Mr. Beaudoin holds a Master's degree in International Affairs, with a focus on International Economics and Econometric Modelling, from UC San Diego and a Bachelor's degree in Political Science from Lewis & Clark College. In addition, he holds numerous advanced certifications in AWS and Google Cloud services.

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Ready to Upskill the Organization?

We Have the Science for That.

Caltech builds better innovators out of your employees and management teams. Through unique programs at the nexus of technology, engineering, science, and business, we work with your company's senior teams to deliver scalable capabilities and strategic agility.

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Select Customizable Programs from Caltech CTME

Programs are tailored for context, challenge, cohort, capabilities, culture, content, co-location, and the Caltech experience.

Executive and Senior Teams

- AI Academy
- AI/ML Lab for Engineering & Science
- Reinventing Work for the Age of AI
- Deep Tech: Advanced Technology Management
- Creating Compelling Value Propositions
- Creating Customer Journeys
- Critical Issues in Global Marketing
- Digital Marketing Strategies
- Integrating Marketing and Commercialization in the Technical Enterprise
- Launching New Products and Services
- Managing Projects n Technology Marketing
- Marketing with Agility
- Needs-Based Segmentation
- Next Generation Global Supply Chain Management Program (60 workshops)
- Product Lifecycle Management
- ROI and Finance for Marketing Professionals
- Scenarios and Simulations
- Strategic Pricing
- Strategic Technology Marketing
- Technology Branding
- Unthink! Problem Solving Workshop

Analytics, AI, and Machine Learning

- Aerospace Operations Analytics
- Artificial Intelligence Academy at Caltech
- Data Analytics Bootcamp
- Data Science Bootcamp
- Machine Learning for Advanced Analytics
- Deep Learning with Google TensorFlow
- Large Language Models for AI

Cybersecurity

- Cybersecurity Strategy Executive Workshop
- Securing Cyber-Physical Product Development

Innovation Management

- Accelerating Lean Product Development
- Digital Transformation and the Future of the Enterprise
- Intellectual Property Strategy
- Unthink! An Ingenious Problem-Solving Workshop
- Supplier Innovations
- Industrial DevOps

Leadership

- Amp Up Your Team!
- Behavioral Leadership
- Business Writing for Technical Professionals
- Developing and Sustaining High-Performance Teams
- Enterprise Agility Workshop
- Influencing Without Authority
- Leading Advanced Technologies & Innovation
- Leading Organizational Change
- Leading Sustainable Futures Programs
- Technical Leadership Programs
- Total Safety Leadership

Operations and Supply Chain Management

- Essentials for Sales and Operations Planning
- Leading/Managing Aerospace Supply Chains
- Supplier Process Engineering
- Lean Six Sigma Green Belt/Black Belt
- Strategic Sourcing in Aerospace & Defense
- Sourcing to Support R&D
- Building Critical Support Functions
- Next Generation Global Supply Chain Management Program (60 workshops)

Project and Program Management

- Advanced Project Management Certificate (*Managing Complex Projects; Risk Management; Dealing with Project Change; Managing New Product Development; Juggling Multiple Projects; Project Rescue and Recovery, Supplier Management*)
- Caltech Project Management Certificate (*Project Costing, Selection & Initiation; Project Organization & Leadership; Detailed Project Planning, Monitoring & Control, Risk and Opportunity Management*)

Project Management Short Courses

- Agile Project Management
- Industrial DevOps
- DisciplinedAgile® Scrum Master/ Sr. Scrum Master Workshops (PMI ATP)
- Springboard PMP®: Exam Prep (PMI ATP)

Technology Marketing and Commercialization

- Caltech Strategic Technology Marketing
- Creating Compelling Value Propositions
- Creating Customer Journeys
- Critical Issues in Global Marketing
- Launching New Products and Services
- Needs-Based Segmentation
- Product Lifecycle Management
- Scenarios and Simulations
- Strategic Pricing

Caltech Center for Technology & Management Education

Participants

Caltech's educational offerings cater to the professional development needs of professionals and key personnel in technology-centric enterprises. Our expertise lies in customizing training solutions for your organization — these programs are crafted to sharpen the abilities required to excel in your industry. These flexible courses are perfectly suited for those seeking to enhance their expertise or to tackle new challenges to bring value to their organization. Ideal participants vary by topic and program.

Why Caltech CTME?

Transform your career and organization with Caltech's Center for Technology and Management Education. Our programs are designed not just for learning but for substantial personal and organizational impact.

Expert instruction—Our instructors and faculty are seasoned industry leaders with extensive backgrounds in engineering, innovation, and executive leadership. They bring practical insights from technology-sectors to each class, empowering you with real-world knowledge.

Impactful Learning—With Caltech's action learning approach, engage in classes and workshops featuring real-world cases and interactive exercises. Apply new strategies immediately to address complex business challenges effectively.

Flexible Formats—Whether you prefer online, on-campus, or your site, CTME accommodates your schedule with various program options. Advance your education seamlessly alongside your professional commitments.

Professional Advancement—Earn a distinguished Caltech certificate through comprehensive or targeted courses. Our programs also provide valuable continuing education credits, fostering both personal growth and career advancement.

Tailored Organizational Solutions—Enhance your company's capabilities with custom executive and professional education. We specialize in building high-performance teams and strategic agility to navigate disruptive technologies and market dynamics.

Choose Caltech CTME for education that delivers real impact, flexibility, and a pathway to leadership excellence.

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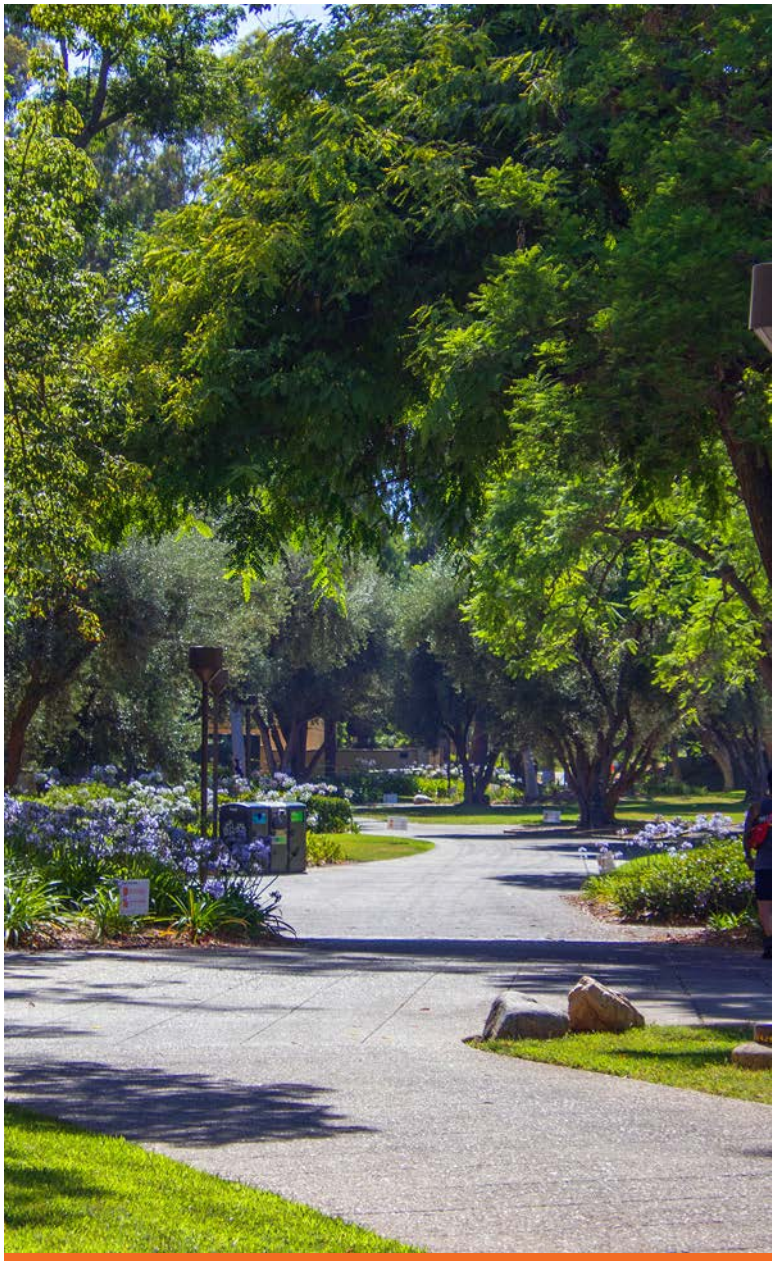

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