



UCIRVINE | EXTENSION

Corporate Training

Systems Engineering Certificate Program

Accelerate Your Career



Improve Your Career Options with a Professional Certificate

In today's competitive business environment, leaders are appointed based on credentials and experience. To stay ahead of the competition, advance your career and increase your earning potential, enroll in one of University of California, Irvine Extension's professional certificate programs. Convenient and affordable, UC Irvine Extension makes it easy to learn on your own time, in your own way. Courses are designed to ensure you gain mastery of a particular topic, and instructors are highly qualified leaders in their professions.

UC Irvine Extension is the only continuing education provider in Orange County that represents the University of California. A certificate bearing the UC seal signifies a well-known, uncompromising standard of academic excellence.



Systems Engineering Certificate Program

As engineering systems become more complex, they require the expertise of individuals possessing both the engineering discipline and the ability to see the bigger picture and integrate system components to create a holistic system.

This program looks at the systems engineering process as a multifaceted and multi-disciplined function within an organization. It focuses on the engineering of systems and the development of a systems engineering mindset through “systems thinking.” The core body of knowledge relates to the underlying principles of the systems engineering process, systems requirements engineering, design, integration, verification, and validation.

Who Should Enroll?

This program has been designed to benefit all engineers, program managers, project managers and those in other technical and non-technical disciplines who are involved in any aspect of the system development lifecycle including procurement, definition, implementation, production, and support. Those who are involved with project or enterprise-level process improvement will also benefit from this program.

For More Information:

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Program Customization

Through UC Irvine Extension’s Corporate Training Division, this program can be customized to meet the specific needs of your company and/or department. Our dedicated Corporate Accounts team will handle all of the logistics to ensure your satisfaction from beginning to end. To learn more or schedule a free consultation, contact us at (949) 824-5736.

Customized on-site training has been delivered to:

- Abbott Vascular
- Allergan, Inc.
- Avery Dennison
- Behr Paints
- Boeing Company
- California Department of Water and Power
- Kaiser Permanente
- L-3 Communications
- Louis Vuitton
- Northrop Grumman Corporation
- Panasonic
- Parker Aerospace
- Safenet
- Southern California Edison
- Toshiba
- Volkswagen de Mexico
- Western Digital
- And More...



Curriculum

Certificate Requirements

A certificate is awarded upon completion of 15 credit units: 4 required courses (2.5 units each) and two elective courses (a minimum of 5 units total), with a grade point average of “C” or better.

Program Delivery Options

Depending on your needs, we can offer training to your organization in any of the following formats:

- Face-to-face delivery in company or on-site
- Face-to-face delivery at the UC Irvine campus for a specific company and/or department
- 100% online for a specific company and/or department (synchronous and/or asynchronous formats available)
- Hybrid – A blend of face-to-face and online delivery
- Video teleconferencing for a specific company and/or department

Transfer Credit

UC Irvine Extension has an articulation agreement with the Georgia Institute of Technology in which they will accept specific coursework from this certificate program as credit towards their Professional Master of Applied Systems Engineering Degree Program. To learn more, please call (949) 824-5415.



Apply courses in this certificate to a Professional Master's Degree at Georgia Tech.

Required Courses

Foundations of the Systems Engineering Process

EECS X491.81 (2.5 units)

Increase your understanding of the systems engineering processes, standard development models, strategies, terminology and products produced over the systems development lifecycle. Familiarize yourself with the concepts of systems engineering, and establish the foundation for more in-depth activities such as requirements engineering, design, integration, verification and validation. Participants gain knowledge of the entire systems development lifecycle and key systems management activities including configuration management, technical reviews, risk management, and systems engineering planning.

Systems Requirements Engineering

EECS X491.71 (2.5 units)

Familiarize yourself with an effective method for defining a set of requirements for a system. The focus is on the initial problem space definition, defining user needs, concept of operations, systems, segment, subsystem requirements, and architecture. Gain an understanding of the following five key requirements engineering activities: elicitation of requirements, documentation and specifications, analysis and functional decomposition, requirements management, and verification and validation. Learn about the principles and characteristics of organizing a well written requirements specification.

Prerequisite: EECS X491.81, Foundations of the Systems Engineering Process.

System Design and Integration

EECS X491.94 (2.5 units)

Increase your knowledge of the system design and integration phases associated with the systems engineering process. Learn about design decision analysis based on requirements, interface management across in-house disciplines, supplier and customer. An emphasis is placed on design management and integration methods such as risk management, Integrated Master Plan/Integrated Master Schedule (IMP/IMS), Work Breakdown Structure,



Technical Performance Measurement (TPM), and technical reviews/audits for measuring, tracking and validating the systems design and integration process.

Prerequisite: EECS X491.81, Foundations of the Systems Engineering Process, and EECS X491.71, Systems Requirements Engineering.

System Validation and Verification

EECS X491.93 (2.5 units)

Expand your knowledge of test and evaluation, analysis, demonstration, and examination as methods of inspection for proving design capability compliance with requirements. A focus is placed on tools and techniques utilized to manage the complete verification process. Learn how to structure a traceable flow of planning strings from the requirements in specifications through verification requirements, verification plans, procedures and reports. Integrated planning and reporting structures are presented, as well as the utility of computer databases.

Prerequisite: EECS X491.81, Foundations of the Systems Engineering Process, and EECS X491.71, Systems Requirements Engineering.

Elective Courses (Choose 2)

Simulation-Based Engineering for Complex Systems

EECS X429.2 (2.5 units)

Gain hands-on experience and increase your understanding of the benefits of simulation-based approaches for engineering complex systems. Learn how to model and analyze the interactions between system components, and system behaviors using the Operational Evaluation Modeling for Context-Sensitive Systems (OpEMCSS) simulation program. Systems engineers learn to model adaptive behaviors of components within decision-oriented architectures. The modeling refers to “Intelligent Agents” which learn and create rules that optimize system performance in a real world environment.

Prerequisite: EECS X491.81, Foundations of the Systems Engineering Process, or equivalent experience.

Systems Engineering Tools and Methods

EECS X491.98 (3.0 units)

Increase your knowledge of key systems engineering tools that every systems engineer must know. Learn how to apply them correctly to avoid pitfalls and how to achieve the best possible balanced solution in terms of performance, delivery, and cost. Gain an understanding of how to synthesize technical management solutions based on principles and practices including Integrated Product Process Development, Kepner-Tregoe Methodologies, Analytical Hierarchy Process, Quality Function Deployment, Taguchi Methods, Statistical Process Control, Capability Maturity Model Integration, Technical Performance Measurement and opportunity/risk management.

Prerequisite: EECS X491.81, Foundations of the Systems Engineering Process, or equivalent experience.

INCOSE Systems Engineering Professional Certification Preparation

EECS X491.96 (1.5 units) (Online Course)

Prepare yourself to be a Systems Engineering Professional (SEP). This course helps prepare systems engineering professionals for the International Council of System Engineering (INCOSE) Certification examination. Gain a comprehensive overview of the INCOSE certification process including candidate guidelines for becoming certified, systems engineering related work and educational experience requirements, and the application process. Increase your understanding of the core knowledge that a systems engineer needs to be skilled in: general systems engineering knowledge, systems engineering management, requirements and architecture definition, systems integration, verification and validation, and enterprise process management.

In addition to these electives, candidates may choose course/s (5 units) from the Project Management and/or Communication and Networking Certificate Programs to fulfill elective units.



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