UCI Extension

Engineering Programs

- Communications Systems Engineering
- Device Software Engineering
- DSP Systems Engineering
- Embedded Systems Engineering
- Optical Engineering
- Optical Instrument Design
- Systems Engineering

Accelerate Your Career

extension.uci.edu.engineer

University of California, Irvine
Improve Your Career Options with a Professional Certificate or Specialized Studies Program

University of California, Irvine Extension's professional certificate and specialized studies programs help you increase or enhance your current skills or prepare for a new career. Courses are highly practical and instructors are qualified leaders in their field. Convenient online courses make it easy to learn on your own time, in your own way. A certificate bearing the UC seal signifies a well-known, uncompromising standard of excellence.

Engineering Programs
Businesses rely heavily on knowledgeable Engineering professionals who can apply their technical expertise in ways that help achieve business goals. UC Irvine Extension is the place where you can find certificate and specialized studies in existing and emerging technologies that drive business. We can help you broaden your skill set and gain the tools and techniques necessary to move ahead in your technical career.
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Corporate Training

Our Corporate Training specialists can deliver any of these programs or customize one that fits your company’s specific needs.

Visit extension.uci.edu/corporate or call (949) 824-1847 for information.
The continued need for highly efficient communications systems is universal with increased communications applications for data, voice, and video. The Communications Systems Engineering Certificate Program provides comprehensive knowledge on current and emerging technologies in the design and development of communications-based networks and systems. The program addresses advances in electronics, computing, networking, and wireless technologies.

Who Should Enroll
This program is designed for engineering and technical professionals, information systems professionals, and others who want to develop a comprehensive understanding of communications engineering principles and practices.

Program Benefits
- Gain the knowledge needed to design and develop modern-day communication systems
- Learn how to describe, analyze, and design practical applications for data, voice, and video systems
- Develop a “systems” approach to your organization’s communications engineering development process

Certificate Eligibility and Requirements
The Communications Systems Engineering Certificate Program is designed for degreed professionals or those with an associate degree, or equivalent work experience.

A certificate is awarded upon completion of 15 credit units (6 required and 9 elective credit units) with a course grade of “C” or better in each course. It is recommended that candidates complete the required courses prior to the elective courses.

To become an official candidate in the program, students pursuing the certificate must submit a Declaration of Candidacy. To receive the certificate after completing all program requirements, students must submit a Request for Certificate. All requirements must be completed within 5 years after the student enrolls in his/her first course. Students not pursuing the certificate program are welcome to take as many individual courses as they wish.

Transfer Credit
Graduates from UC Irvine Extension’s Communications Systems Engineering Program are eligible to transfer credits to:
- University of Nebraska - Lincoln Online Master of Engineering (with a concentration in Engineering Management)
- University of Wisconsin - Platteville Online Master of Science in Engineering.

Note: Any student wishing to transfer credits must obtain a “B” or better in each course.

Program Fees
The total cost of the program varies depending on the electives chosen. Actual fees may differ from the estimate below. Fees are subject to change without prior notice.

Course Fees
(6 required and 9 elective units) $3,625
Candidacy fee $125
Textbooks and Materials $550
Total Estimated Cost $4,300

For More Information
Jennifer Mortensen
j.mortensen@uci.edu
(949) 824-9722

Advisory Committee
Tom Doyle, President and COO, Whistle Labs
Farhad Mafie, President and CEO, Savant Company, Inc.
Carlos Oliveira, Chief Operating Officer, Nextfort Ventures
Nazila Safavi, Wireless Communications Consultant Engineer
Shahram Shafie, RF Systems Staff Engineer, Qualcomm Inc.
Marty Wartenberg, P.E., Business Consulting and Training

extension.uci.edu/comm
<table>
<thead>
<tr>
<th>COURSE #</th>
<th>REQUIRED COURSES (6 units)</th>
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<tr>
<td>EECS X490</td>
<td>Introduction to Communications and Networking</td>
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<td>EECS X490.1</td>
<td>Communications Systems Design</td>
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<tr>
<td>EECS X491.18</td>
<td>TCP/IP Network Design</td>
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<td>EECS X490.42</td>
<td>Network Systems Security</td>
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<td>EECS X499.42</td>
<td>Fundamentals of Wireless Communications</td>
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<td>EECS X499.52</td>
<td>Principles of RF/Microwave Wireless Electronic Systems</td>
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<td>EECS X495</td>
<td>DSP Fundamentals, Modeling and Analysis*</td>
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<tr>
<td>EECS X499.43</td>
<td>Evolution of Wireless Networks to 4G LTE and Beyond</td>
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<tr>
<td>EECS X495.2</td>
<td>DSP for Communications Systems</td>
<td>3</td>
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* Course requires hardware or software, please refer to online listing for details.
Organize your company’s device software engineering strategies

Further your career as an embedded systems engineer

Specialized Studies Award Requirements
Candidates must possess a fundamental understanding of C programming for embedded systems; or possess equivalent experience or education. A Specialized Studies certificate is awarded upon completion of 3 required courses (9 units total) with a course grade of “C” or better in each course.

To receive your certificate, submit a Request for Certificate after completing all program requirements.

Students not pursing a specialized studies award are welcome to take as many individual courses as they wish.

For More Information
Jennifer Mortensen
j.mortensen@uci.edu
(949) 824-9722

Program Fees
The total cost of the program varies depending on the electives chosen. Actual fees may differ from the estimate below. Fees are subject to change without prior notice.

Course Fees
(1.5 prerequisite and 9 required units) $3,625
Candidacy fee $35
Textbooks and Materials $570
Total Estimated Cost $4,230

Device Software Engineering Specialized Studies Program

Programming embedded devices in the electronics and computer engineering industry requires a different skill set than computer software programming. The coding must be precise and succinct to meet memory constraints and specialized needs of the product that the embedded system resides in, whether it be medical, automotive, or consumer oriented.

The Specialized Studies Program in Device Software Engineering addresses best practices in managing the embedded software engineering process, including design, engineering and co-development of hardware software. The purpose of the program is to provide a core competency in software engineering practices in embedded systems software development, with a focus on device drivers.

Who Should Enroll
This program is designed for individuals who want to write device drivers for embedded systems. It is also valuable to those who evaluate software development requirements, determine criteria for embedded development applications, establish programming methodologies to address embedded applications, and support hardware and embedded software development activities.

Program Benefits
- Develop concise and effective code for embedded systems applications
- Improve the hardware and software co-development process
- Organize your company’s device software engineering strategies
- Further your career as an embedded systems engineer

Specialized Studies Award Requirements
Candidates must possess a fundamental understanding of C programming for embedded systems; or possess equivalent experience or education. A Specialized Studies certificate is awarded upon completion of 3 required courses (9 units total) with a course grade of “C” or better in each course.

To receive your certificate, submit a Request for Certificate after completing all program requirements.

Students not pursuing a specialized studies award are welcome to take as many individual courses as they wish.

For More Information
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Course Fees
(1.5 prerequisite and 9 required units) $3,625
Candidacy fee $35
Textbooks and Materials $570
Total Estimated Cost $4,230

- Prerequisite: EECS 805 C Programming for Embedded Systems or equivalent experience.

Course requires hardware or software, please refer to online listing for details.

extension.uci.edu/dse
Digital Signal Processing (DSP) has emerged as an important technology for modern electronic systems. It is a form of embedded design that is one of the newest and hottest fields, and is considered to be the workhorse of choice for many computational intensive applications. Modern applications include biomedical communications, imaging, speech, video, and multimedia signal processing.

Who Should Enroll
This program is designed for individuals involved in the evaluation, design or development of systems employing digital signal processing, or as an introduction to DSP technology.

Program Benefits
- Understand the essential mathematics and algorithms in DSP
- Gain hands-on experience in designing and implementing DSP algorithms
- Learn about DSP processors and architectures
- Discover how to program DSP code
- Create practical applications

Specialized Studies Award Requirements
Candidates should have a bachelor's degree in computer science or electrical engineering or equivalent knowledge acquired through training and experience in hardware design and development. A Specialized Studies certificate is awarded upon completion of 3 required courses (9 units total) with a course grade of "C" or better in each course.

For More Information
Jennifer Mortensen
j.mortensen@uci.edu
(949) 824-9722

Program Fees
The total cost of the program varies depending on the electives chosen. Actual fees may differ from the estimate below. Fees are subject to change without prior notice.

Course Fees
(4.5 prerequisite and 9 required units) $3,350
Candidacy fee $35
Textbooks and Materials $487
Total Estimated Cost $3,872

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<td>C Programming for Embedded Systems</td>
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<td>EECS X494.19</td>
<td>MATLAB for Engineers</td>
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<tr>
<td>EECS X495</td>
<td>DSP Fundamentals, Modeling and Analysis***</td>
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<td>C Programming for DSP**</td>
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<td>EECS X495.2</td>
<td>DSP for Communications Systems*</td>
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<td>EECS X498.61</td>
<td>Real-Time Embedded Digital Signal Processing</td>
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<td>EECS X498.6</td>
<td>Digital Signal Processing with FPGAs**</td>
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<td>EECS X498.73</td>
<td>Motor Control Algorithms and Applications-Part 2*</td>
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<td>EECS X497.11</td>
<td>Image and Video Compression: Fundamentals, Standards, and Trends</td>
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* Course requires hardware or software, please refer to online listing for details.
** Prerequisite: EECS 805, C Programming for Embedded Systems, or equivalent experience.
*** Prerequisite: EECS X494.19, MATLAB for Engineers, or equivalent experience.
Today’s embedded systems development ranges from microprocessor-based control systems, to system-on-chip (SoC) design, and device software development. A myriad of implementations can be found in consumer electronics, medical devices, and commercial and military applications.

This certificate program looks at embedded systems engineering as a synergistic function between hardware and software device design and development. Participants learn the essential concepts of embedded systems development through a practical hands-on approach utilizing industry design automation (EDA) tools and design kits.

Who Should Enroll
Working professionals who are interested in transitioning into the embedded systems/system-on-chip (SoC) industry including: hardware/software engineers, computer engineers, communications and networking engineers, control systems engineers, and other technical professionals involved in embedded systems design and development.

Program Benefits
- Gain essential knowledge of embedded systems design and programming
- Learn how to program an embedded device
- Become proficient in programmable logic design and analysis
- Increase your understanding of real-time operating systems
- Explore the latest embedded technologies
- Utilize EDA tools to optimize embedded systems designs

Certificate Eligibility and Requirements
The Embedded Systems Engineering Certificate Program is designed for individuals with working experience or education in engineering or computer science, and can demonstrate proficiency in C programming. Candidates must complete EECS 805, C Programming for Embedded Systems; and EECS X497.2, Introduction to Digital Logic and Hardware Architecture; or possess equivalent experience or education in engineering or computer science.

A certificate is awarded upon completion of 15 credit units (9 required and 6 elective credit units), with a course grade of “C” or better in each course.

To become an official candidate in the program, students pursuing the certificate must submit a Declaration of Candidacy. To receive the certificate after completing all program requirements, students must submit a Request for Certificate. All requirements must be completed within 5 years after the student enrolls in his/her first course.

Students not pursuing the certificate program are welcome to take as many individual courses as they wish.

Transfer Credit
Graduates from UC Irvine Extension’s Embedded Systems Engineering Program are eligible to transfer credits to:
- University of Nebraska - Lincoln Master of Engineering (with a concentration in Engineering Management)
- University of Wisconsin - Platteville Online Master of Science in Engineering

Note: Any student wishing to transfer credits must obtain a “B” or better in each course.

Program Fees
The total cost of the program varies depending on the electives chosen. Actual fees may differ from the estimate below. Fees are subject to change without prior notice.

- Course Fees (4.5 prerequisite, 9 required and 6 elective units) $4,800
- Candidacy fee $125
- Textbooks and Materials $1,350

Total Estimated Cost $6,275

For more information:
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extension.uci.edu/embedded

IEEE Members receive a 10% discount!
**Advisory Committee**

- Aaron Baranoff, Senior Principal Engineer, VubIQ
- Bob Condie, Engineering Firmware Development Consultant
- Daniel D. Gajski, Professor Emeritus and Recall Professor, Electrical Engineering and Computer Science, University of California, Irvine
- Ian Harris, Professor, Computer Science, University of California, Irvine
- William Hohi, SIP Documentation and Training, Intel Corporation
- Joseph Hwang, Senior Manager, Panasonic Avionics

**Corporation**

- Hank Jacobs, Senior Software Engineer, Applied Medical
- John Koelsch, Senior Architect, Safenet Government Solutions, LLC
- Farhad Mafie, President and CEO, Savant Company, Inc.
- Rich Newman, Sales Engineer, Synopsys Inc.
- Robert Weber, Software Consultant, R&B Embedded Technologies
- Saleem Yamani, Principal Engineer, Western Digital

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**CURRICULUM**

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<tr>
<th>COURSE #</th>
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<tr>
<td>EECS 805</td>
<td>C Programming for Embedded Systems</td>
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<tr>
<td>EECS X497.2</td>
<td>Introduction to Digital Logic and Hardware Architecture</td>
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<tr>
<td>EECS X497.32</td>
<td>Fundamentals of Embedded Systems Design and Programming*</td>
<td>3</td>
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<tr>
<td>EECS X497.36</td>
<td>Embedded Systems Architecture*</td>
<td>3</td>
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<tr>
<td>EECS X497.34</td>
<td>Real-Time Embedded Systems Programming**</td>
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<th>COURSE #</th>
<th>ELECTIVE COURSES (Minimum 6 units)</th>
<th>UNITS</th>
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**Embedded Hardware Development**

- EECS X494.92 Logic Design and Analysis using Verilog | 3 |
- EECS X494.94 VHDL Design and Modeling of Digital Systems* | 3 |
- EECS X494.95 FPGA Design with Hardware Description Languages* | 3 |

**Embedded Software Development**

- EECS X497.5 C++ for Embedded Systems | 3 |
- EECS X497.3 Motor Control Algorithms and Applications-Part 1* | 3 |
- EECS X497.33 Motor Control Algorithms and Applications-Part 2* | 3 |
- EECS X497.19 Writing Portable Device Drivers* | 3 |
- EECS X497.31 Designing Embedded Software Using RTOS** | 3 |
- EECS X497.10 Fundamentals of Embedded Linux | 3 |
- EECS X497.11 Linux Driver Primer | 1.5 |
- EECS X497.39 Embedded Systems Design Using ARM Technology** | 3 |
- EECS X497.4 Applied Control Theory for Embedded Systems* | 3 |
- EECS X498.61 Real-Time Embedded Digital Signal Processing* | 3 |

* Course requires hardware or software, please refer to online listing for details.

**Prerequisite: EECS 805, C Programming for Embedded Systems; or equivalent experience.
Optical Engineering
Certificate Program

An increasing amount of today’s consumer, industrial and business products incorporate lenses and optical systems. These are essential to virtually every industry including defense, medical, clean energy, nanotechnology, automotive, electronics, communications, entertainment, computers, and consumer products. The Optical Engineering Certificate Program addresses the growing demand for skilled professionals who can conceptualize, design, and manufacture optical components and systems.

Who Should Enroll
The Optical Engineering Program gives students the skills and experience needed to enter this growing field. The program will benefit entry and mid-level professionals who need to broaden their knowledge and improve their career options.

Program Benefits
- Gain useful insights and practical skills for designing and engineering optical, components and systems
- Explore the latest technologies in optical engineering including new optical materials and the latest cost effective manufacturing techniques
- Develop skills with industry standard optical software tools
- Discover innovative approaches for optical engineering and analysis
- Learn through hands-on design courses which provide skills in manual design, computer simulation, and the art of creating optical components and systems
- Understand and effectively communicate details of optical technical specifications to manufacturer’s and quality control personnel

Certificate Eligibility and Requirements
Candidates should complete EECS X496.51 Geometrical Optics and EECS X496.52 Physical Optics or possess equivalent experience or education. Candidates that choose to take both courses may count one as an elective course.

A certificate is awarded upon the completion of 15 credit units (9 required and 6 elective credit units), with a course grade of “C” or better in each course.

Program Fees
The total cost of the program varies depending on the electives chosen. Actual fees may differ from the estimate below. Fees are subject to change without prior notice.

Course Fees
(9 required and 6 elective units) $4,305
Candidacy fee $125
Textbooks and Materials $975
Total Estimated Cost $5,405

For More Information
Jennifer Mortensen
j.mortensen@uci.edu
(949) 824-9722

Register for a membership with the Optical Society of Southern California to receive 15% off required courses.
Advisory Committee

Ed Arriola, Chief Engineer, LightWorks Optics
Arnie Banzensky, Field Sales Manager, Schott Glass Technologies
Valentina Doushkina, M.Sc., Director of Engineering, N2 Imaging
Mark Gallagher, Ph.D., J.D, Partner, Knobbe, Martin & Bear, LLP
Joshua Jo, Ph.D., Principle Engineer, Samsung Electro-Mechanics
Gregory Klotz, Opto-Mechanical Design Engineer, nanoPrecision Products

Brian Monacelli, Ph.D., Optical Engineer, Jet Propulsion Laboratory; Photonics Instructor, Irvine Valley College
Forrest Reynard, CEO, Reynard Corporation, Advanced Optical Solutions
Donn M. Silberman, M.S. Founding Director, Optics Institute of Southern California; Sr. Applications Engineer, PI (Physik Instrumente)
Bruce Tromberg, Ph.D., Professor, College of Medicine, Biomedical Engineering, Director, Beckman Laser Institute, University of California, Irvine
Desire Whitmore, Ph.D., Science Curriculum Specialist, Learning Design Group, University of California, Berkeley

CURRICULUM

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<tr>
<td>EECS X496.51</td>
<td>Geometrical Optics*</td>
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<td>EECS X496.52</td>
<td>Physical Optics*</td>
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<td>Advanced Lens Design</td>
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<td>EECS X496</td>
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<td>EECS X496.53</td>
<td>Optical Metrology and Interferometry*</td>
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<td>EECS X497</td>
<td>Optomechanical Component Design</td>
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<td>EECS X498</td>
<td>Optical Instrument Design</td>
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<tr>
<td>EECS X493.55</td>
<td>Introduction to Lasers</td>
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<td>EECS X493.56</td>
<td>Introduction to Fiber Optics</td>
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<tr>
<td>EECS X499</td>
<td>Optomechanical Systems Engineering</td>
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<tr>
<td>EECS X493.58</td>
<td>Vibration Control for Optomechanical Systems</td>
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<tr>
<td>EECS X494.1</td>
<td>Introduction to Radiometry: The Propagation and Measurement of Optical Radiant Energy</td>
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</table>

* Course requires hardware or software, please refer to online listing for details.

For more information:
Jennifer Mortensen
j.mortensen@uci.edu
(949) 824-9722
An increasing amount of today’s consumer, industrial, and business products incorporate optomechanical systems. These are essential to virtually every industry including: defense, medical, clean energy, nanotechnology, automotive, electronics, communications, entertainment, computers, and consumer products. The Optical Instrument Design Certificate Program builds on optical systems engineering skills gained in the Optical Engineering Program and address the growing demand for skilled professionals who can conceptualize, design, and manufacture these optical and optomechanical components, systems, and instruments.

Who Should Enroll
The Optical Instrument Design Program provides advanced study options for experienced optical engineering professionals allowing them to address a wider range of optical and optomechanical design issues. The elective courses provide an opportunity for students to develop specialized skills related to their professional needs or personal interests.

Program Benefits
- Gain useful insights and practical skills for designing and engineering optomechanical components and instruments
- Explore the latest technologies in optical engineering including new optomechanical materials and the latest cost effective manufacturing techniques
- Develop skills with industry standard optical and mechanical software tools
- Discover innovative approaches for optical instrument design and analysis
- Learn through hands-on design courses which provide skills in manual design, computer simulation, and the art of creating optical instruments
- Understand and effectively communicate details of optical & optomechanical technical specifications to manufacturer’s and quality control personnel

Certificate Eligibility and Requirements
Candidates should complete EECS X496.51 Geometrical Optics and EECS X496.52 Physical Optics or possess equivalent experience or education. Candidates that choose to take both courses may count one as an elective course.

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Course Fees
(6 required and 9 elective units) $4,305
Candidacy fee $125
Textbooks and Materials $945
Total Estimated Cost $5,375

Register for a membership with the Optical Society of Southern California to receive 15% off required courses.

For More Information
Jennifer Mortensen
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(949) 824-9722

extension.uci.edu/optics
Advisory Committee

Ed Arriola, Chief Engineer, LightWorks Optics
Valentina Doushkina, M.Sc., Director of Engineering, N2 Imaging
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Mark Gallagher, Ph.D., J.D, Partner, Knobbe, Martens, Olson & Bear, LLP
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G.P. Li, Ph.D., Professor, School of Engineering; Director, California Institute for Telecommunications & Information Technology, University of California, Irvine
Brian Monacelli, Ph.D., Optical Engineer, Jet Propulsion Laboratory; Photonics Instructor, Irvine Valley College
T. Scott Rowe, Principal, Rowe Technical Design
Donn M. Silberman, M.S. Founding Director, Optics Institute of Southern California; Sr. Applications Engineer, PI (Physik Instrumente)
James D. Trolinger, Ph.D., Co-Founder, MetoLaser, Inc.
Bruce Tromberg, Ph.D., Professor, College of Medicine, Biomedical Engineering, Director, Beckman Laser Institute, University of California, Irvine
Wytze van der Veer, Ph.D., Senior Director of Laser Engineering, Cutera Inc.

QUARTERLY SCHEDULE OF COURSES

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<tr>
<td>EECS X496.53</td>
<td>Optical Metrology and Interferometry*</td>
<td>3</td>
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<tr>
<td>EECS X497</td>
<td>Optomechanical Component Design</td>
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<td>EECS X493.55</td>
<td>Introduction to Lasers</td>
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<td>EECS X493.56</td>
<td>Introduction to Fiber Optics</td>
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<td>EECS X493.58</td>
<td>Vibration Control for Optomechanical Systems</td>
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<td>EECS X493</td>
<td>Introduction to Lens Design</td>
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<td>EECS X493.1</td>
<td>Advanced Lens Design</td>
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<tr>
<td>EECS X496</td>
<td>Optical Systems Engineering</td>
<td>3</td>
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</table>

* Course requires hardware or software, please refer to online listing for details.

* Course can be taken at Irvine Valley College (IVC) http:academics.ivc.edu/physci/photonics. Submit final transcripts to UCI Extension department for transfer credit after course completion.
The expanding complexity of providing products and services in a worldwide marketplace with a global workforce has fueled an increase in demand for Systems Engineers. Systems Engineers utilize a combination of product development and service delivery fundamentals including program and project management techniques and keen business skills. Systems Engineers plan, coordinate, and manage team efforts that translate customer requirements and operational needs into effective solutions that meet cost, schedule, and performance goals.

The Systems Engineering Certificate prepares you to sit for the Associate and Certified levels of the Systems Engineering Professional exams (ASEP & CSEP) given by the International Council on Systems Engineering (INCOSE). Recognized internationally, these certifications have set the standard for excellence in systems engineering. In addition, courses in this program can be applied to a Professional Master’s Degree in Applied Systems Engineering (PMASE) from Georgia Institute of Technology. This degree, from one of the top five engineering schools in the U.S., is offered primarily online.

Who Should Enroll

This program benefits program managers, project managers, and those in technical and non-technical disciplines who are involved in any aspect of the development and deployment of products or services. This includes development, design, operations, manufacturing, testing, implementation, procurement, cost, scheduling, training, and support. Those who are involved with project or program management or enterprise-level process improvement will also benefit from this program.

Program Benefits

- Gain critical skills and techniques to optimize product development and service deployments
- Acquire useful and practical skills to improve your organization’s operational efficiency
- Reduce project and program risks while keeping on schedule and under budget
- Analyze customer needs and develop clear requirements that translate into optimal products and services
- Develop innovative approaches for systems design and integration
- Utilize simulation-based engineering to optimize development and deployment efforts
- Define verification and validation programs tailored to your company and your customer’s risk threshold
- Identify, prioritize, and select relevant solutions to solve complex engineering problems and processes
- Apply tools, resources, organizational systems, and decision making processes to successfully manage the development and delivery of products and services
- Prepare for CSEP industry certification

Certificate Eligibility and Requirements

A certificate is awarded upon completion of 15 credit units: 4 required courses (2.5 units each) and 5 units of elective courses, with a course grade of “B” or better in each course.

To become an official candidate in the program, students pursuing the certificate must submit a Declaration of Candidacy. To receive the certificate after completing all program requirements, students must submit a Request for Certificate. All requirements must be completed within 5 years after the student enrolls in his/her first course. Students not pursuing the certificate program are welcome to take as many individual courses as they wish.

Program Fees

The total cost of the program varies depending on the electives chosen. Actual fees may differ from the estimate below. Fees are subject to change without prior notice.

Course Fees

- (10 required and 5 elective units) $4,170
- Candidacy fee $125
- Textbooks and Materials $300
- Total Estimated Cost $4,595

extension.uci.edu/systemseng
Advisory Committee

Carlee Bishop, Ph.D., Executive Director, Professional Masters in System Engineering, Georgia Institute of Technology

Derek Dunn-Rankin, Ph.D., Professor and Chair, Mechanical and Aerospace Engineering, University of California, Irvine

Carol J. Gutierrez, M.S. - System Engineering, MBA, INCOSE ESEP, CM

Rick Hefner, Ph.D., Program Director, California Institute of Technology

John C. Hsu, Ph.D., M.S., PE, Technical Director of Systems Management and Engineering Consulting Services; Adjunct Professor at California State University Long Beach; Fellow, American Institute of Aeronautics and Astronautics

Thomas V. Huynh, Ph.D., Associate Professor Systems Engineering, Naval Postgraduate School

Scott Jackson, M.S., CSET, Fellow of the International Council on Systems Engineering (INCOSE); Adjunct Faculty in Systems Engineering and Resilience Architecting, University of Southern California

Michael E. Krueger, President, ASE consulting, LLC, Co-author of INCOSE Systems Engineering Handbook

Ian Presland, CEng, CSEP, INCOSE UK; Professional Development Director Systems Engineering Business Manager, Thales Training & Consultancy

Benjamin Wu, Ph.D., PE, MBA, Managing Partner, Quality and Productivity Advisors

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**CURRICULUM**

<table>
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<th>COURSE</th>
<th>REQUIRED COURSES</th>
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<tr>
<td>EECS X491.81</td>
<td>Foundations of the Systems Engineering Process</td>
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<td>EECS X491.71</td>
<td>Systems Requirements Engineering</td>
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<td>EECS X491.93</td>
<td>System Validation and Verification</td>
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<td>EECS X491.94</td>
<td>System Design and Integration</td>
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<table>
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<tr>
<th>COURSE</th>
<th>ELECTIVE COURSES (Minimum 5 units)</th>
<th>UNITS</th>
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<tr>
<td>EECS X429.2</td>
<td>Simulation-Based Engineering</td>
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<tr>
<td>EECS X491.98</td>
<td>Systems Engineering: Tools &amp; Methods</td>
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<tr>
<td>EECS X491.96</td>
<td>INCOSE Systems Cert. Prep</td>
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</table>

For more information:

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julie.pai@uci.edu
(949) 824-6333
Academic Management

Dave Dimas, Ph.D., Director, Engineering, Sciences and Information Technologies

Engineering Programs

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