

UCLA

Extension



Engineering & Technology Short Courses

A Short Step to Taking Your Career Further

Spring 2019

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UCLA Extension also offers customized technology and engineering training that can be offered on-site at your workplace. These fast, flexible, specialized programs can help you achieve your goals, stay up to date on current trends, and learn about cutting-edge technology. Benefits of having UCLA Extension training on-site include:

- Customizable to suit your company's needs
- Allows for open and confidential discussions among employees
- Flexibility to accommodate a greater number of attendees
- Additional cost savings by eliminating employee travel expenses
- Each attendee receives a certificate of participation and continuing education units from UCLA Extension

Courses are offered on a variety of technical subjects, including aerospace and mechanical engineering, biomedical engineering, communications and sensors engineering, electronics, leadership and project management, and more.

Visit uclaextension.edu/shortcourses19.



UCLA Extension Short Courses

New technology. Evolving engineering techniques. Advances in science.

These things are what makes working in a technical field so exciting and also why continuing education is so important. UCLA Extension short courses give you the tools you need to upgrade your career or take off in an exciting new direction in just 2-5 days. You'll get intensive training in a variety of cutting-edge technical fields, giving you technical and practical knowledge you can apply immediately.

Our world-class instructors are selected from the top ranks of industry and academia, so you get relevant, real-world education from experts in the field. For more than 50 years, UCLA Extension has presented technical and management short courses for engineers, IT professionals, and technical managers seeking to keep abreast of new and rapidly changing technologies.

Enrollment Discounts

Save 10% when you enroll at least one month prior to the start of a course.

UCLA Extension short courses also offer a **special Team Advantage discount**.

For every three members you enroll, you can add a **fourth enrollment for free**.



DSP-Based Carrier and Timing Recovery Techniques in Digital Modems

uclaextension.edu/dsp

This course will teach you the essential concepts of full DSP synchronization for timing recovery, phase recovery, and carrier recovery. You'll learn the processes through sample designs and implementations. Real-time MATLAB simulations will illustrate essential concepts for a number of common modulation schemes, such as QPSK and QAM, as well as CPM, Offset QPSK, VSB, OFDM, and CDMA.

Coordinator & Lecturer:

Fredric Harris, PhD, Professor of Electrical and Computer Engineering, University of California, San Diego

Dates: April 8 & 10, 2019
Reg#: 367575
Course No.: EC 830.80
Units: 1.2 CEUs
Fee: \$2,295

Essentials of Control and Estimation Theory, Tools, and Applications

uclaextension.edu/essentials-control

Control and estimation theory and their aerospace applications have been used for more than 50 years. Yet, this is the only single course that puts these two important and useful topics together and demonstrates their practical aspects in detail. It also provides MATLAB/SIMULINK-related tools for real industrial problems. The course covers three major topics with hands-on lab experience: control basics, estimation basics, and advanced case studies. The course provides numerous aerospace design examples, including spacecraft attitude control, large space structure vibration control, and disk drive suspension servo control.

Coordinator & Lecturer:

Richard Chiang, PhD, Sr. Engineering Specialist at Control Analysis Department, The Aerospace Corporation.

Dates: April 22-24, 2019
Reg#: 367580
Course No.: ME 830.20
Units: 1.8 CEUs
Fee: \$2,995

Modern Microwave & MM-wave Antenna Measurements including 5G

uclaextension.edu/microwaves

This updated course is an intensive and comprehensive presentation of all aspects of the measurement of microwave antenna characteristics. Instruction presents techniques for the determination of antenna radiation patterns, directivity, gain, polarization, and impedance. Topics include the design, use, and evaluation of all capabilities used for antenna measurements, including outdoor ranges, compact ranges, anechoic chambers, and all near-field scanning methods in current use. Experimental results obtained from measured data illustrate these concepts.

Coordinator & Lecturer:

Yahya Rahmat-Samii, PhD, Distinguished Professor, Department of Electrical Engineering, Henry Samueli School of Engineering and Applied Science, UCLA

Lecturers:

Donald G. Bodnar, PhD, Consultant
Zhong Chen, MSEE, ETS-Lindgren
Per O. Iversen, MSEE, Orbit/FR, Inc.
Michael Foegelle, PhD, ETS-Lindgren

Dates: May 7-9, 2019
Reg#: 367577
Course No.: EC ENGR 810.70
Units: 1.8 CEUs
Fee: \$2,995

Applications, Design, and Testing of CMOS and CCD Sensors and Camera Systems

uclaextension.edu/applications-design

This course benefits scientists, engineers, and hardware managers that are involved with the selection, specification, and design of CMOS/CCD camera systems for a variety of applications. In recent years, CMOS sensors have been increasingly displacing CCD sensors as the preferred and more useful in many imaging applications. In this course, the advantages and disadvantages of sensor technologies and their fundamental engineering description are covered.

Coordinator & Lecturer:

Terrence Lomheim, PhD, Distinguished Engineer, Sensor Systems Subdivision, The Aerospace Corporation

Dates: May 20-21, 2019
Reg#: 367581
Course No.: EC ENGR 840.20
Units: 1.2 CEUs
Fee: \$2,295

Spacecraft Structural Design and Verification

uclaextension.edu/spacecraft-design

This course is intended to help practicing engineers and managers (structural or non-structural) with limited structural background become familiar with the concepts, techniques, and practices that are essential to the development of spacecraft structures. The general background of spacecraft structures, fundamental structural mechanics theories, and the engineering procedures from design to verification are introduced.

Coordinator & Lecturer:

Donald Edberg, PhD, Professor of Aerospace Engineering, California State Polytechnic University.

Todd D. Coburn, PhD, PE, DER, Aerospace Strength & Structures, Cal State Polytechnic University Pomona

Dates: May 22-24, 2019
Reg#: 367578
Course No.: ME 810.170
Units: 1.8 CEUs
Fee: \$2,995

Spacecraft Dynamics, Control and Attitude Determination

uclaextension.edu/spacecraft-dynamics

In this course, you will learn how to design a spacecraft or satellite attitude control system by exploring real spacecraft design and understanding modern practical design and analysis methods. Although designed for practitioners, this course highlights the fundamental theory behind the design methods by presenting in detail, numerous modern real-life spacecraft attitude control design examples, such as Spaceway and Cassini, are illustrated using the latest tools developed in MATLAB/SIMULINK. Participants learn to model spacecraft dynamics, design spacecraft attitude control systems, and perform trade-off study on approaches, hardware, and performance requirements.

Coordinator & Lecturer:

Richard Y. Chiang, PhD, Sr. Engineering Specialist at Control Analysis Department, The Aerospace Corporation

Dates: May 29-31, 2019
Reg#: 367579
Course No.: MECH&AE 830.90
Units: 1.8 CEUs
Fee: \$2,995

Aircraft Flight Mechanics and Aerodynamics Stability and Control

uclaextension.edu/aircraft-mechanics

The primary objective of this course is to introduce the subject of Flight Mechanics, as applied to atmospheric, fixed-wing, flight vehicles, and to provide a clear understanding of related topics, specifically Aerodynamics, Propulsion, Performance, Static and Dynamic Stability, and Flight Controls. The course starts with an overview of the development of flight,

followed by a brief review of aerodynamic and propulsion principles, before shifting the focus onto aircraft performance, stability and control, and flight controls. Both the theory and practical methods for designing and analyzing fixed-wing aircraft for a wide range of applications will be examined.

Coordinator & Lecturer:

Kamal Shweyk, MS, Boeing Associate Technical Fellow and Senior Flight Dynamics and Control Engineering

Dates: June 3-5, 2019
Reg#: 367712
Course No.: MECH&AE 830.42
Units: 1.8 CEUs
Fee: \$2,995

Kalman Filtering: Theory and Applications

uclaextension.edu/kalman-filtering

This course is designed for practitioners, such as system engineers, system analysts, software engineers, hardware engineers, project managers, military operational personnel who want to develop, streamline, or enhance their knowledge and experiences in Kalman filters. Instruction provides a foundation for both the basic theory and practical application of Kalman filtering. Case studies illustrate GPS navigation, integrated inertial navigation, precision navigation using GPS carrier-phase, spacecraft stellar-inertial attitude determination, precision clock, and radar/laser target tracking.

Coordinator & Lecturer:

Ken Li, PhD, Boeing Senior Technical Fellow, Boeing Defense, Space and Security Systems

Dates: June 10-13, 2019
Reg#: 367582
Course No.: MECH&AE 830.70
Units: 2.4 CEUs
Fee: \$3,595

Satellite Communications Networks and Applications

uclaextension.edu/satellite-networks

This intensive three-day course provides a state-of-the-art review of satellite communications networks and applications from system and service perspectives. Owing to innovations in high-throughput satellites, advanced modulation and coding (MODCOD), solid state power amplification and mobile antennas, and profitability require advanced thinking and innovation. Technical, operations, and business professionals, as well as newcomers to satellite technology learn the fundamentals, architecture, and development of modern satellite networks.

Coordinator & Lecturer:

Bruce Elbert, MSEE, MBA, President, Application Technology Strategy, Inc.

Dates: June 18-20, 2019
Reg#: 367586
Course No.: EC 810.90
Units: 1.8 CEUs
Fee: \$2,995

2019 Public Short Course

- April 8 & 10** DSP-Based Carrier and Timing Recovery Techniques in Digital Modems
- April 22-24** Essentials of Control and Estimation Theory, Tools, and Applications
- May 7-9** Modern Microwave & MM-wave Antenna Measurements including 5G
- May 20-21** Applications, Design, and Testing of CMOS and CCD Sensors and Camera Systems
- May 22-24** Spacecraft Structural Design and Verification
- May 29-31** Spacecraft Dynamics, Control and Attitude Determination
- June 3-5** Aircraft Flight Mechanics and Aerodynamics Stability and Control
- June 10-13,** Kalman Filtering: Theory and Applications
- June 18-20,** Satellite Communications Networks and Applications

To learn more, call **(310) 825-3858**,
email shortcourses@uclaextension.edu,
or visit us at uclaextension.edu/shortcourses19.