**UCLA** Extension



Engineering & Technology Short Courses

# A Short Step to Taking Your Career Further

## Spring 2020

# Stay on Course at Your Workplace

## On-Site Training

UCLA Extension 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 record 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/shortcourses20**.

## 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 get intensive training in a variety of cutting-edge technical fields, giving you technical and practical knowledge you can apply immediately. All courses are conducted online in fully synchronous mode.

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 60 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

UCLA Extension short courses offer a **special Team Advantage discount**.
For every three members you enroll, you can add a **fourth enrollment for free**.

## 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, and project managers, as well as military operational personnel who want to develop, streamline, or enhance their knowledge and experiences in Kalman filters. Instruction provides a solid foundation for both the basic theory and practical application of Kalman filtering. Case studies illustrate the latter, including GPS navigation, integrated inertial navigation, and precision navigation. The course is unique in providing participants with a ready-to-use, step-by-step approach for employing Kalman filtering to their practical applications. The instructors have a combined 50 years of experience in Kalman filter design, analysis, tuning, implementation, validation, and verification.

**Coordinator & Lecturer:**
**Rongsheng "Ken" Li, PhD,** Boeing Senior Technical Fellow

**Dates**: May 11-14, 2020
**Course No.**: MECH&AE 830.70
**Units**: 2.4
**Fee**: $3,595

## Space Launch Vehicle and System Engineering
uclaextension.edu/spacelaunch

Understand the "big picture" of space launch vehicle design by exploring the history of manned and unmanned launch vehicles, along with current designs and future concepts. Learn all the design drivers such as required acceleration performance, trajectory and orbit/escape injections. Lectures present orbital mechanics in a manner that provides an easy understanding of underlying principles including launch vehicle performance requirements and launch windows. Review practical aspects of launch vehicles, such as fabrication and testing, including several examples of, and the lessons learned from, launch vehicle failures. The oral presentation is supplemented with the lecturer's new Launch Vehicle Design textbook. Students receive a USB drive containing an extensive set of design data, videos illustrating different concepts that are shown in class, and a sample vehicle optimization input file.

**Coordinator & Lecturer:**
**Donald Edberg, PhD,** Professor of Aerospace Engineering, California State Polytechnic University, Pomona

**Dates**: May 20-22, 2020
**Course No.**: MECH&AE 810.110
**Units**: 1.8
**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 a historical 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, citing real-world examples that are based on the instructor's extensive experience in the aerospace industry. The importance of key parameters and principles will be further highlighted using examples of actual aircraft accidents.

**Coordinator & Lecturer:**
**Kamal Shweyk**, Boeing Associate Technical Fellow and Senior Flight Dynamics and Control Engineer

**Dates**: May 27-28, 2020
**Course No.**: MECH&AE 830.42
**Units**: 1.2
**Fee**: $2,295

## EMI/EMC Compatibility Design and Signal Integrity

uclaextension.edu/emi-emc

If you are a design engineer, it pays for you to know how and why EMI testing is conducted, as well as the typical causes of failure. This course offers all of the EMI information you'll need to design compliant Printed Circuit Boards (PCBs) and your end item—including design considerations at CAE and CAD levels—for you to provide a compliant radiation/susceptibility product. You'll examine ways to prevent common EMI/EMC problems regarding power supplies, cables, connectors, slots, discontinuity of ground planes and more. This class will focus on EMI and RFI issues regarding PCBs, computers, analog designs and systems, along with relevant EMI regulations in the U.S., the European Union and Asia.

**Coordinator & Lecturer:**
**Robert Hanson, MSEE,** University of Southern California, **BSEE**, University of Washington

**Dates**: June 2-4, 2020
**Course No.**: EC ENGR 870.200
**Units**: 1.8
**Fee**: $2,995

## DSP-Based Carrier and Timing Recovery Techniques in Digital Modems

uclaextension.edu/dsp-carrier

Learn the essential concepts of full DSP synchronization for timing recovery, phase recovery, and carrier recovery. Understand the processes through sample designs and implementations. Real-time MATLAB simulations 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.
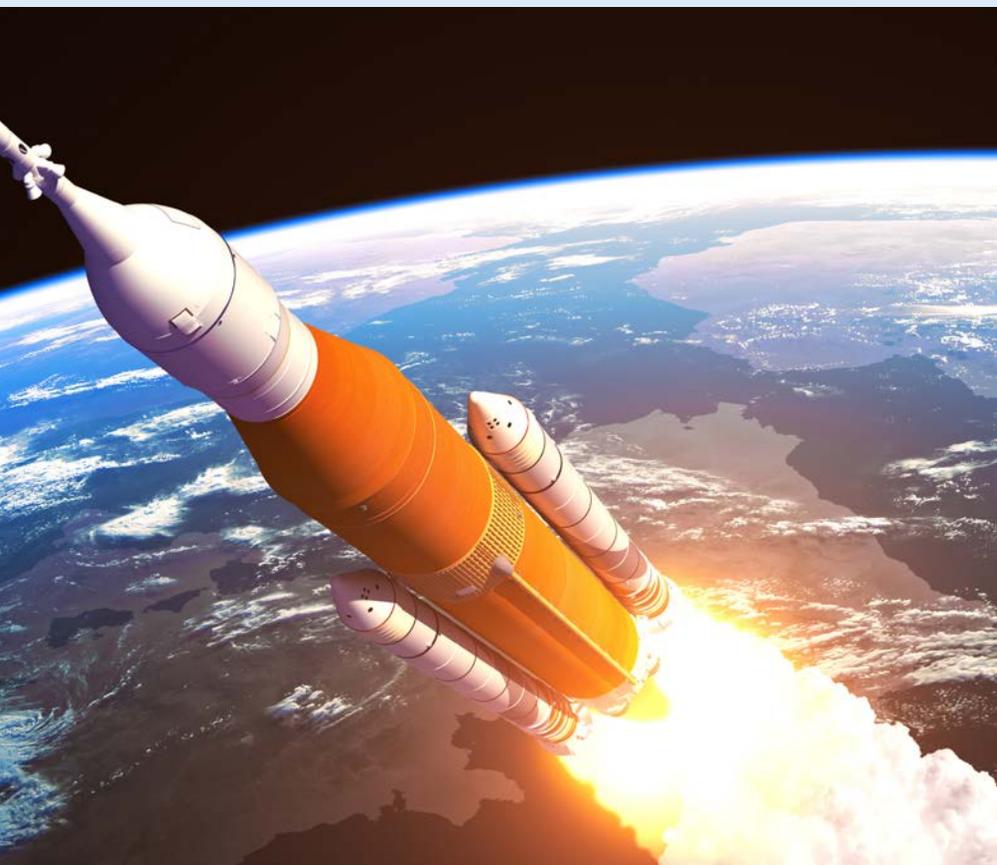
**Coordinator & Lecturer:**
**Fredric Harris, PhD**, professor of Electrical and Computer Engineering at University of California San Diego

**Dates**: June 16-17, 2020
**Course No.**: EC ENGR 830.80
**Units**: 1.2
**Fee**: $2,295

# UCLA Extension

## Spring 2020 Public Short Courses

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|---|---|
| **May 11-14** | Kalman Filtering: Theory and Applications |
| **May 20-22** | Space Launch Vehicle and System Engineering |
| **May 27-28** | Aircraft Flight Mechanics and Aerodynamics Stability and Control |
| **June 2-4** | EMI/EMC Compatibility Design and Signal Integrity |
| **June 16-17** | DSP-Based Carrier and Timing Recovery Techniques in Digital Modems |

To learn more, call **(310) 825-3858**, email **shortcourses@uclaextension.edu**, or visit us at **uclaextension.edu/shortcourses20**.