Engineering & Technology

Short Courses

Winter 2014
UCLA Extension is one of the largest providers of continuing education in the United States, and continues a 50+ year tradition of presenting quality technical and management short courses for engineers, information technology professionals, and technical managers seeking to keep abreast of new and rapidly changing technologies. Short courses:

- Range from 2-5 days, emphasizing highly-specialized content
- Attract participants from across the U.S. & around the world
- Develop new courses continually to reflect current needs
- Have instructors that are well-respected experts drawn from academia, industry & government
- Teach theory & application plus encourage in-depth discussion with our experts
- Are conducted in the UCLA Extension building, adjacent to the scenic UCLA campus, Westwood restaurants & near the Getty Center museum
- Allow participants to take advantage of UCLA’s recreational facilities, including a running track, Olympic-size swimming pools, weight rooms, and tennis & racquetball courts.

### Short Courses

#### Aerospace & Mechanical Engineering
- **Jan 13-15:** Satellite Thermal Control
- **Feb 3-5:** Aircraft Design Loads and Certification
- **Feb 5-7:** UAV Aircraft Design
- **Feb 18-20:** Repair of Composite Structures
- **Feb 18-21:** Airframe Stress Analysis and Sizing
- **Feb 24-27:** Composite Airframe Structures
- **Mar 18-19:** Autonomous Flight Control of UAVs

#### Communications & Sensors Engineering
- **Jan 16-17:** DSP-Based Carrier and Timing Recovery Techniques in Digital Modems
- **Jan 22-24:** Digital Communications Systems
- **Jan 22-24:** Multitarget/Multisensor Data Fusion Techniques
- **Mar 3-6:** Biometric Identification
- **Mar 10-11:** Wireless Planning and Design
- **Mar 10-12:** Fundamentals of CCD and CMOS Imagers and Camera Systems
- **Mar 13-14:** Applications, Design, and Testing of CMOS and CCD Sensors and Camera Systems

#### Technical Management
- **Mar 23-28:** 87th Technical Management Program

All courses held at UCLA Extension or on the UCLA campus. Course fee includes course materials.
Satellite Thermal Control
Learn to conduct thermal analysis and participate in the thermal design of satellite systems. Topics include: principles of spacecraft thermal design; overview of satellite systems and space flight thermal environments; active and passive thermal control hardware, cryogenic cooling systems, and thermal analysis tools used in the aerospace industry and the satellite thermal control testing process.

Coordinator and Lecturers
David G. Gilmore, Senior Engineering Specialist, Spacecraft Thermal Department, The Aerospace Corporation, and is the editor of the course text, Spacecraft Thermal Control Handbook.
Tung T. Lam, PhD, Director, Spacecraft Thermal Department, The Aerospace Corporation.
John W. Welch, Associate Director, Spacecraft Thermal Department, The Aerospace Corporation.

Dates: Jan 13-15 (Mon-Wed)
Reg#: Z5915
Course No.: Engineering 885.168
Units: 1.8 CEU (18 hours of instruction)
Fee: Through Dec 13: $2455
After: $2695

Digital Communications Systems
Short of bandwidth, power, or both, what do you do? Learn to design and evaluate digital communication systems, and most importantly, how to make good design choices based on given requirements and tough situations. Learn about channels—the Good, the Bad, and the Awful—and multipath and fading and how to live with their degrading effects. Play the “LDPC game” to understand the message-passing algorithms used in turbo and low-density parity-check (LDPC) codes. Examine other creative techniques, such as trellis-coded modulation and Orthogonal FDM (OFDM).

Coordinator and Lecturer
Bernard Sklar, PhD, President, Communications Engineering Services, and is the author of Digital Communications: Fundamentals and Applications.

Dates: Jan 22-24 (Wed-Fri)
Reg#: Z5917
Course No.: Engineering 881.231
Units: 1.8 CEU (18 hours of instruction)
Fee: Through Dec 22: $2455
After: $2695

Multitarget/Multisensor Data Fusion Techniques
Learn the sensor and data fusion methods that improve the probability of correct target detection, classification, identification, and state estimation. Understand the principles, algorithms, architectures, applications and advantages of new and existing systems, and acquire the skills to develop and apply data fusion algorithms to complex situations.

Coordinator and Lecturer
Lawrence A. Klein, PhD, consults in developing multiple sensor concepts for tactical and reconnaissance military applications, millimeter-wave and infrared sensors for homeland defense, and sensor and data fusion concepts for intelligent transportation systems, and is the author of Millimeter-Wave and Infrared Multisensor Design and Signal Processing and Sensor Technologies and Data Requirements for ITS.

Dates: Jan 22-24 (Wed-Fri)
Reg#: Z5918
Course No.: Engineering 823.89
Units: 1.8 CEU (18 hours of instruction)
Fee: Through Dec 22: $2455
After: $2695

Enroll Early to Save!
Visit uclaextension.edu/shortcourses today.
Aircraft Design Loads and Certification
Learn the methods for performing aircraft loads analysis as well as how to present and validate those loads for civil or military certification. Topics also include how design modifications might impact design loads.

Coordinator and Lecturer
Willem J. Kernkamp, MS, Loads and Flutter Certification Consultant, Kernkamp Industries Corporation, Chatsworth, California.

Lecturer
Jason D. Schwarz, MS, Project Engineering, L-3 Communications Integrated Systems.

Dates: Feb 3-5 (Mon-Wed)
Reg#: Z5919
Course No.: Engineering 839.101
Units: 1.8 CEU (18 hours of instruction)
Fee: Through Jan 3: $2455
After: $2695

UAV Aircraft Design
This dynamic course covers the conceptual design, development, and operation of Unmanned/Uninhabited Air Vehicles (UAVs), including combat vehicles (UCAVs). Learn sizing, layout design, analysis of aerodynamics, weights, propulsion, range, performance, and cost estimation, along with specific aspects of UAV design and optimization, including concept development, systems integration, integration of unmanned control systems, and considerations for operational environment.

Coordinator and Lecturer
Daniel P. Raymer, PhD, President, Conceptual Research Corporation; and author of Aircraft Design: A Conceptual Approach; Dan Raymer’s Simplified Aircraft Design for Homebuilders; and his aircraft design autobiography, Living in the Future.

Dates: Feb 5-7 (Wed-Fri)
Reg#: Z5920
Course No.: Engineering 839.76
Units: 1.8 CEU (18 hours of instruction)
Fee: Through Jan 5: $2455
After: $2695

Airframe Stress Analysis and Sizing
Learn how to produce strong and economic airframe designs by selecting the right structural configurations and materials while also considering the effects of static, fatigue, fail-safe requirements, damage tolerance, and repairability. Learn sizing methods and rough estimation techniques that give you quick and accurate solutions to design problems during the preliminary structural design phase. This course provides metallic airframe sizing information and data in tables, charts, and/or curves based on past experience and/or test results.

Coordinator and Lecturer

Dates: Feb 18-21 (Tue-Fri)
Reg#: Z5947
Course No.: Engineering 839.91
Units: 2.4 CEU (24 hours of instruction)
Fee: Through Jan 18: $2635
After: $2895

Repair of Composite Structures
Military and commercial aircraft structures, including Boeing 787 and Airbus A350-XWB, extensively use composite materials, but structures such as fuselages, wings and other safety-critical primary structures easily damage in service due to various impact events and environmental exposure. Learn repair technology of aircraft composite and sandwich structures including bonded repair process, bolted repair process, repair analysis and validation, repair design criteria and repair assessment and inspection.

Coordinator and Lecturer
Jenn-Ming Yang, PhD, Professor and Chair, Department of Materials Science and Engineering, Henry Samueli School of Engineering and Applied Science, UCLA, and has published over 200 technical papers.

Lecturer
Hamid Saghizadeh, PhD, MBA, Boeing Technical Fellow, Boeing IDS, Space and Intelligence Systems (S&IS).

Dates: Feb 18-20 (Tue-Thu)
Reg#: Z5923
Course No.: Engineering 839.106
Units: 1.8 CEU (18 hours of instruction)
Fee: Through Jan 18: $2455
After: $2695
Composite Airframe Structures
Learn to design low-cost and weight-efficient composite airframe structures with structural integrity to specifications and regulations for a broad range of aircraft configurations, including transports, fighters and general aviation aircraft. This fast-paced course covers guidelines, observations, design factors, pros and cons of design cases, troubleshooting techniques and best practices for the design and fabrication of composite components.

Coordinator and Lecturer
Michael C.Y. Niu, MS, President, AD Airframe Consulting Company.

Dates: Feb 24-27 (Mon-Thu)
Reg#: Z5948
Course No.: Engineering 839.77
Units: 2.4 CEU (24 hours of instruction)
Fee: Through Jan 24: $2635
After: $2895

Wireless Planning and Design
Build your knowledge of point to point wireless transmission planning, design or maintenance, and learn how well-designed microwave radio networks can achieve the same stringent performance requirements as fibre optics. Due to environmental concerns, radio links need to work in non-ideal situations; this course provides practical, real-world guidance to help you make a risk/cost assessment.

Coordinator and Lecturer
Trevor Manning, founder of TMC Global, a training and consultancy company; and advisory board member for Vertel, a world leading wireless carrier, and Manning is the author of Microwave Radio Transmission Design Guide.

Dates: Mar 10-11 (Mon & Tue)
Reg#: Z5953
Course No.: Engineering 881.291
Units: 1.2 CEU (12 hours of instruction)
Fee: Through Feb 10: $1815
After: $1995

Biometric Identification: Theory, Algorithms, and Applications
Biometric identification technologies (the automatic recognition of individuals based on physical and/or behavioral characteristics) date back over 50 years to the earliest digital computers. Over the last two decades, biometric identification devices have become faster, cheaper, and more reliable, allowing for a variety of applications. This course looks at the history, theory, algorithms, applications, and standards of biometric recognition, including voice, iris, face, hand, and fingerprint identification.

Coordinator and Lecturer
James L. Wayman, PhD, Office of Research and Graduate Studies, San Jose State University, and is the author of dozens of articles in books, peer-reviewed technical journals, and conference proceedings

Dates: Mar 3-6 (Mon-Thu)
Reg#: Z5952
Course No.: Engineering 867.143
Units: 2.4 CEU (24 hours of instruction)
Fee: Through Feb 3: $2635
After: $2895

Fundamentals of CCD and CMOS Imagers and Camera Systems
Learn the ultimate performance limits and fundamental performance differences between CCD/CMOS technologies and high-performance CCD/CMOS pixel architectures to select a sensor or camera system. Understand how CCD/CMOS sensors and cameras are characterized and calibrated through the photon transfer technique, as well as how video signals are processed for optimum signal-to-noise performance. This dynamic course also reviews current and future CCD/CMOS technologies and applications.

Coordinator and Lecturer
James R. Janesick, MSEE, Director, CMOS Advanced Development Group, SRI International, and contributed to several NASA Tech Briefs and is the author of Scientific Charge-Coupled Devices and Photon Transfer.

Dates: Mar 10-12 (Mon-Wed)
Reg#: Z5954
Course No.: Engineering 823.90
Units: 1.8 CEU (18 hours of instruction)
Fee: Through Feb 10: $2455
After: $2695
Applications, Design, and Testing of CMOS and CCD Sensors and Camera Systems
Learn the advantages and disadvantages of CCDs and CMOS sensor technologies, and how CMOS sensors provide highly integrated and flexible digital camera systems. Topics include visible sensor camera design and imaging performance; requirements flow-down, camera and sensor specification, and corresponding verification by testing; plus future trends.

Coordinator and Lecturer
Terrence S. Lomheim, PhD, Distinguished Engineer, Sensor Systems Subdivision, The Aerospace Corporation, and has authored and coauthored 60 publications in the areas of visible and infrared focal plane technology, sensor design and performance, and applied optics.

Dates: Mar 13-14 (Thu-Fri)
Reg#: Z5955
Course No.: Engineering 823.86
Units: 1.2 CEU (12 hours of instruction)
Fee: Through Feb 13: $1815
After $1995

Autonomous Flight Control of UAVs
Unmanned air vehicles (UAVs) are becoming increasingly common and useful. Learn the fundamental UAV flight controls, including flight dynamics, developing dynamical models, autopilot design and development, and guidance techniques for path planning and tracking.

Coordinator and Lecturer
Manu Sharma, PhD, Senior Manager, Satellite Development Center, Boeing, has industry and academic experience in guidance and control of aerospace vehicles ranging from unmanned aircraft, missiles, guided munitions, and satellites, and is an expert in nonlinear and adaptive control for aerospace applications.

Dates: Mar 18-19 (Tue-Wed)
Reg#: Z5956
Course No.: Engineering 839.102
Units: 1.2 CEU (12 hours of instruction)
Fee: Through Feb 18: $1815
After $1995

Let Us Know What You Are Interested In
For more information call the Short Courses Program Office at (310) 825-3344, fax the form below to (310) 206-2815 or visit uclaextension.edu/shortcourses today.

Winter 2014

Please fill in correct Reg# and all other information requested below.

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Upcoming Programs

Modern Microwave Antenna Measurements—May 13-16, 2014
Join global industry peers, thought leaders, and researchers innovating microwave antenna measurement methodologies, designs, and applications for a 4-day intensive course. Gain comprehensive perspective delving into modern antenna measurement use, design, technique, and evaluation.

Includes a tour of the UCLA Antenna Range.

Dates: May 13-16, 2014 (Tue-Fri)
Reg #: Z6229
Course No.: Engineering 881.239
Units: 2.4 CEUs (24 instruction hrs)
Fee: Through Apr 13: $2,635
      After: $2,895

Technical Management Program (TMP)
When you come to TMP you focus on enhancing leadership skills; learning the latest business trends and paradigms; and discovering new ways to solve problems, plan strategies, and motivate colleagues.

Designed for engineers, scientists, and other technical professionals, the program provides a practical blend of technical and managerial information to improve personal and organizational performance. Participants leave the program invigorated and inspired, with new ideas and skills to immediately apply in the workplace.

Dates: Mar 23-28, 2014
Reg#: Z7537
Course No.: Engineering 850
Fee: Through Feb 23: $3,595
      After: $3,995
Short Courses

Winter 2014

Learn from the experts

Accelerate your career by taking one of our 2 to 5 days short courses.

For full course descriptions and to enroll, visit uclaextension.edu/shortcourses

Early enrollment discount:
Register at least 1 month in advance to save up to 10%