

Electrical Engineering

Power System Overvoltages

CEU: 0.65, Course Length: 6.5 Hours

This course covers a broad range of topics in power system overvoltage studies. In it, several industry experts speak on these areas. The presentations include an overview, followed by a discussion of low frequency transients, such as electromechanical oscillations, ferroresonance, bus transfer and controller interaction. An in-depth discussion is given for switching surge transients due to operations of transmission lines, cables, transformers, capacitors and inductors and application of faults. The tutorial also covers lightning overvoltages, very fast front transients in gas insulated substations, power electronics devices in power systems, and protection and relaying.

Presenters: This course from the IEEE features a number of presenters, including Arvind Chaudhary, Daniel Durbak, Doug Mader, Juan Martinez, Bruce Mork, and Karl Sen.

Producer: Institute of Electrical and Electronics Engineers, Inc.

Intended Audience: Industry engineers, researchers and students who have a basic background in transient analysis of power systems.

Delivery Method	Price:	Per Person	Per Site (6+)
Videotape (EN02052802)		\$515	\$2,640
CD-ROM (CD02052702)		\$465	N/A

Engineering Professional Development

Organizational Reliability

CEU: 1, Course Length: 10 Hours

If you boarded a jet flight at random every day, it would take on average 26,000 years before you succumbed to a major crash (*Quality Progress*, January 1997, p. 25). Well-defined processes and systems are the foundation on which this outstanding performance rests and that provide the context within which reliability tools and methods are used. This course focuses on how to define processes and systems in a manufacturing supply chain context, how metrics and knowledge feedback drive superior performance and enable risk management, which organizations are particularly effective in managing risk and how they do it, and how one can begin changing one's organization to enable improved performance.

Presenters: Dr. Roy Schuyler works for E.I. DuPont de Nemours & Co, and is an adjunct professor of reliability engineering at the University of Maryland.

Producer: University of Maryland, College Park

Intended Audience: Technical professionals and management leaders with the desire to develop the knowledge base and leadership skills required to meet these challenges.

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN02080101)		\$600	\$4,650
Online (OL02021302)		\$450	N/A
CD-ROM (CD02021302)		\$510	N/A

Integrated Circuits

Practical Verilog for Simulation and Synthesis Series

CEU: 1, Course Length: 10 Hours

This series, which includes hands-on lab sessions, provides a practical knowledge of Verilog for simulation and synthesis. In these courses, the emphasis has been put on those parts of Verilog that are more frequently used and are more applicable to practical designs. To prepare students for more complex designs, a session of this course contains an overview of the complete Verilog language. The second course presents Verilog for synthesis of digital systems and advanced Verilog topics. A session in this course covers system tasks for test-benches and timing checks. The course shows design, simulation, and synthesis of a complete design.

Presenter: Dr. Zainalabedin Navabi is an adjunct professor of electrical and computer engineering at Northeastern University.

Producer: Northeastern University

Intended Audience: Engineers, scientists and instructors who are already familiar with digital system design.

Delivery Method	Price: Per Person Per Site (6+)	
Videotape (EN03011399)	\$800	\$4,050
Online (OL03011399)	\$650	N/A
CD-ROM (CD03011399)	\$710	N/A

Integrated Circuits

Practical VHDL for Simulation and Synthesis Series

CEU: 1, Course Length: 10 Hours

Combined with hands-on labs, this series provides a practical knowledge of VHDL for simulation and synthesis. Emphasized are those parts of VHDL that are more frequently used and are more applicable to practical designs. The first course presents basics and elements of VHDL by use of simple examples. To prepare students for more complex designs, a session of this course contains an overview of the complete VHDL language, VHDL operators, and IEEE design packages. The second course presents VHDL for synthesis of digital systems and advanced VHDL topics. A session in this course covers advanced topics like TEXTIO and system attributes for test-benches and timing checks. The course shows design, simulation and synthesis of a complete design.

Presenter: Dr. Zainalabedin Navabi is an adjunct professor of electrical and computer engineering at Northeastern University.

Producer: Northeastern University

Intended Audience: Engineers, scientists and instructors who are already familiar with digital system design.

Delivery Method	Price: Per Person Per Site (6+)	
Videotape (EN03012299)	\$800	\$4,050
Online (OL03012299)	\$650	N/A
CD-ROM (CD03012299)	\$710	N/A

IT Management

Optimal Inventory Strategies Across the Supply Chain

CEU: 0.5, Course Length: 5 Hours

In today's competitive marketplace, companies face tremendous pressure to increase customer service levels while simultaneously reducing delivery lead-times and inventory costs. This already difficult problem is further complicated by shorter product life cycles and outsourcing. In order to improve supply chain performance, data-driven models must be used to help quantify and guide optimal supply chain strategy. This course equips participants with the tools to develop and implement an optimal inventory policy in their own supply chain.

Presenter: Dr. Sean Willems is an assistant professor of operations management in Boston University's School of Management.

Producer: Boston University

Intended Audience: Those at a managerial level in business and engineering who handle inventory and product life-cycle issues.

Prerequisites: Although not absolutely necessary, an understanding of the difficulties in managing a supply chain (in particular, the types of variability experienced in everyday operations) will be useful.

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN02081202)		\$465	\$3,840
Online (OL02041904)		\$375	N/A
CD-ROM (CD02041904)		\$405	N/A

Materials Science

Overview of Fatigue Life Prediction Methods for Metals

CEU: 0.4, Course Length: 4 Hours

This course will enable participants to develop an overall strategy to effectively deal with metal fatigue. The development of such a strategy may require decisions on determination of in-service loads, development of material data bases, selection of software packages, design of testing programs and integration of in-service inspections. This course is intended to provide sufficient information for the participant to begin the process of solving their unique metal-fatigue problems. It provides a brief overview of the metal-fatigue mechanism, important terminology and key parameters. It then provides an overview of the three primary methods for metal fatigue life predictions: stress-life, strain-life and fracture mechanics.

Presenter: Dr. Jess Comer is a visiting faculty member for the mechanical engineering department at Iowa State University.

Producer: Iowa State University

Intended Audience: Any engineer who is dealing with metal-fatigue-related problems. This course will especially be useful for engineers and engineering managers who are beginning to develop an overall strategy to deal with fatigue-related problems.

Prerequisites: A basic understanding of material science and stress analysis.

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN02092403)		\$309	\$2,559
Online (OL02092403)		\$249	N/A
CD-ROM (CD02092403)		\$269	N/A

Optics

Fiber Optics for Short Haul Applications

CEU: 0.5, Course Length: 5 Hours

This course presents the basics of fiber optics, with an emphasis on short haul point-to-point and local area network (LAN) applications. Optical waveguide theory is used to develop important parameters of optical fibers, such as numerical aperture, attenuation and bandwidth and pulse dispersion. The characteristics of LEDs, VCSELs and LDs are discussed and their appropriate use in transmitters is shown. Optical detectors and receiver circuits are discussed. Connectors, splices and couplers are introduced from the viewpoint of the losses they cause in a fiber optic system along with their ease of installation. The applications of couplers, taps and switches to the LANs are shown, as are fiber optic system design considerations.

Presenter: Dr. Marvin D. Drake is a senior member of the technical staff in the network design group of the Communications and Networking Division of the MITRE Corp., Bedford, Mass.

Producer: Boston University

Intended Audience: Engineers and scientists working in the field of fiber optics and electronics at the system level.

Delivery Method (10+)	Price: Per Person	Per Site
Videotape (EN02052801)	\$465	\$3,840
Online (OLO1052404)	\$375	N/A
CD-ROM (CD01052404)	\$405	N/A

Optics

Optical Fiber Communication Systems

CEU: 0.5, Course Length: 5 Hours

The optical fiber, with its low-loss and high-bandwidth characteristics, has the potential to provide an enormous capacity of transmitted data. This course will describe the fundamental operation and some recent advances in the exciting area of optical fiber communication systems. The course begins with a description of the basic device technologies and their performance in an optical system. This is followed by discussion on optical system design, including signal, noise and sensitivity in the context of high-speed and long-distance transmission and multi-user networks. Additional topics covered are optical amplifiers, multichannel systems (concentrating on wavelength-division multiplexing), solitons and analog (CATV) transmission.

Presenter: Dr. Alan Willner is currently professor of electrical engineering systems and associate director of the Center for Photonic Technology at the University of Southern California.

Producer: University of Southern California

Intended Audience: Engineers interested in acquiring a working and project-oriented knowledge of an optical communication system, managers wanting a broad overview of the critical technologies and recent directions in optical communication systems, and educators desiring a firm understanding of the fundamental concepts, with the goal of teaching a lecture or laboratory course in optical communications.

Prerequisites: Basic familiarity with semiconductor physics and digital modulation. However, all topics will be explained from fundamental principles.

Delivery Method (10+)	Price: Per Person	Per Site
Videotape (EN02080901)	\$465	\$3,840
Online (OLO2080901)	\$375	N/A
CD-ROM (CDO2080901)	\$405	N/A

Optics

Ultra-Resolution Optical Microscopy

CEU: 0.5, Course Length: 5 Hours

This course addresses the theory, development and application of high-resolution optical microscopy, with a concentration on near-field scanning optical microscopy. It reviews the basics of optics and microscopy near the diffraction limit, including the principles of beam optics, resolution limitations and scanned-probe microscopy. Topics include the theory of near-field scanning optical microscopy and scanned probe microscopes; the design, construction and assessment of near-field microscopes; and the application of near-field microscopy to waveguides, photonic devices and semiconductor characterization, including the solid-immersion-lens microscope and ultra-resolution microscopy techniques in biological and semiconductor systems.

Presenters: Dr. M. Selim Unlu and Dr. Bennett B. Goldberg are faculty members at Boston University.

Producer: Boston University

Intended Audience: Engineers and scientists interested in using high-resolution microscopy to examine optical properties of materials and devices beyond the diffraction limit; technical managers interested in evaluating various techniques for high-resolution microscopy and their applications; and optical professionals and consultants with general interest in new and novel optical techniques.

Delivery Method (10+)	Price: Per Person	Per Site
Videotape (EN02051006)	\$465	\$3840
Online (OLO1051803)	\$375	N/A
CD-ROM (CD01051803)	\$405	N/A

Optics

Optical Networks

CEU: 0.5, Course Length: 5 Hours

This course provides an overview of the basic building blocks and architectures of high-speed optical-fiber communication networks. It begins with an introduction to the applications and basic features of optical networks, followed by a summary of the salient features of the optical building blocks: DWDM optical fibers, DFB lasers and VCSELs, high-speed detectors, high-speed photonic modulators, switches, fiber amplifiers, fiber gratings and optical interconnects for all-optical networks. Networking issues are introduced, including time-domain and wavelength-domain access and subcarrier multiplexing. It offers a broad perspective of core optical networks and a summary of the critical challenges facing this rapidly growing technology.

Presenter: Dr. Bahaa Saleh is professor and chair of the Department of Electrical and Computer Engineering at Boston University.

Producer: Boston University

Intended Audience: Engineers or scientists with no background in optics or communication systems.

Delivery Method (10+)	Price: Per Person	Per Site
Videotape (EN02052201)	\$465	\$3840
Online (OLO1052505)	\$375	N/A
CD-ROM (CD01052505)	\$405	N/A

Optics

Optical Data Storage

CEU: 0.5, Course Length: 5 Hours

This course will review the competing technologies for optical data storage, examining their underlying media, read-write processes, channel characteristics, archival quality and capacity. The techniques now used in CD-ROM, WORM, CD-R, CD-RW, CD-V, MO, DVD and DVD-R devices will be discussed, and contenders for advanced storage technologies, including short wavelength sources, patterned media, near-field optics and holographic systems will be addressed.

Presenter: Dr. Michael Ruane is an associate professor of electrical and computer engineering and a member of the Photonics Center at Boston University.

Producer: Boston University

Intended Audience: Engineers, scientists or technical managers as well as individuals interested in the technical operation of optical data storage devices (as opposed to content generators).

Prerequisites: Physics/optics at the sophomore level; undergraduate EE, systems or communications background. Most of the concepts will be developed in the presentation.

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN02060301)		\$465	\$3,840
Online (OL01060303)		\$375	N/A
CD-ROM (CD01060303)		\$405	N/A

Quality

Quality Function Deployment

CEU: 0.5 Course Length: 5 Hours

Quality function deployment is a means of translating and transferring the customer's view of quality requirements into the appropriate technical product and process requirements. The purpose of this course is to provide the skills necessary to apply this method effectively to those who have responsibilities for using quality function deployment (QFD) for product and process planning. This method is typically used by a combination of marketing, product design and process design personnel. Properly applied, QFD can augment other quality planning methods such as FMEA and advanced product quality planning as required by the QS-9000 quality system standard.

Presenter: Phillip J. Ross graduated from the General Motors Institute with a bachelor's degree in mechanical engineering in 1970. He is a frequent lecturer for several universities, NASA and ASQ.

Producer: National Technological University

Intended Audience: Anyone who wants to employ QFD in the workplace.

Delivery Method	Price: Per Person Per Site (6+)	
Videotape (EN03071501)	\$466	\$2,346
Online (OL03071501)	\$376	N/A
CD-ROM (CD03071501)	\$406	N/A

Six Sigma Executive Overview

CEU: .4, Course Length: 4.5 Hours

In this program, Dr. Douglas Mader provides his unique insight into this customer-centered, systematic, data driven method for achieving breakthrough business performance. This program establishes the business case for Six Sigma and provides proven leadership practices for successfully deploying, maintaining, and evolving the Six Sigma strategy for both service and industrial organizations. In addition, this program demonstrates how to successfully integrate Six Sigma, Design for Six Sigma, and Lean Improvement for breakthrough performance that cuts across all areas of the enterprise from research, to new product development, to manufacturing, to customer service and beyond.

Presenter: Dr. Douglas Mader is an active international speaker, seminar leader and certified master instructor for Six Sigma. He is currently the founder and president of SigmaPro Inc.

Producer: SigmaPro Inc.

Intended Audience: Executives and managers of both service and industrial organizations who are responsible for maximizing shareholder value, as well as individual contributors involved in business improvement efforts.

Prerequisites: None

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN02071201)		\$440	\$3890
CD-ROM (CD02011604)		\$380	N/A
Online (OLO2011604)		\$350	N/A

Electrical Engineering

Grounding and Shielding of Electronic Systems: How to Diagnose and Solve Electrical Noise Problems**CEU: 1.5, Course Length: 15 Hours****Presenter:** Tom Van Doren, University of Missouri-Rolla**Producer:** Van Doren Company

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN02060302)		\$740	\$5,240

Image Processing

Fundamentals of Data and Image Compression**CEU: .5, Course Length: 5 Hours****Presenter:** Dr. Harold P. Stern, University of Alabama**Producer:** National Technological University

Delivery Method	Price:	Per Person	Per Site (6+)
Videotape (EN02061303)		\$290	\$1,290

Integrated Circuits

CMOS Analog Circuit Design**CEU: 1, Course Length: 10 Hours****Presenter:** Harry Li, University of Idaho

Delivery Method	Price:	Per Person	Per Site
CD-ROM (CD02090101)		\$550	N/A

Data Conversion**CEU: 0.7, Course Length: 7 Hours****Presenter:** Harry Li, University of Idaho

Delivery Method	Price:	Per Person	Per Site
CD-ROM (CD02090102)		\$440	N/A

Semiconductor Characterization, Reliability & Failure Analysis**CEU: 0.5, Course Length: 5 Hours****Presenter:** Dieter Schroder, Arizona State University

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN02081901)		\$430	\$3,490

Manufacturing

Operating Excellence—Becoming the Best of the Best: An Integrated Look at the Elements of Operating Excellence and the Strategies for Achieving Outstanding Organizational Performance**CEU: 0.4, Course Length: 4 Hours****Presenter:** Douglas Schaffer, Strategic Alignment**Producer:** National Technological University

Delivery Method	Price:	Per Person	Per Site (6+)
Videotape (EN02020602)		\$260	\$1,260
Online (OL01111504)		\$200	N/A
CD-ROM (CD01111504)		\$220	N/A

Mechanical Engineering

Applied Reliability Engineering In Action**CEU: .5, Course Length: 5 Hours****Presenter:** Dr. Dimitri B. Kececioglu, University of Arizona**Producer:** University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03012801)		\$390	\$3,090

The Applied Accelerated Reliability and Life Testing Concept**CEU: .5, Course Length: 5 Hours****Presenter:** Dr. Dimitri B. Kececioglu, University of Arizona**Producer:** University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03021101)		\$390	\$3,090

Applied Environmental Stress Screening: Its Quantification, Optimization and Management**CEU: .5, Course Length: 5 Hours****Presenter:** Dr. Dimitri Kececioglu, University of Arizona**Producer:** University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03061701)		\$390	\$3,090

Applied Burn-In Testing: Its Quantification and Optimization**CEU: .5, Course Length: 5 Hours****Presenter:** Dr. Dimitri Kececioglu, University of Arizona**Producer:** University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03061702)		\$390	\$3,090

The Weibull Distribution and Its Reliability and Maintainability Engineering Applications**CEU: .5, Course Length: 5 Hours****Presenter:** Dr. Dimitri Kececioglu, University of Arizona**Producer:** University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03061902)		\$390	\$3,090

Complex Equipment and System Reliability Prediction and the Resulting Design Improvements**CEU: .5, Course Length: 5 Hours****Presenter:** Dr. Dimitri Kececioglu, University of Arizona**Producer:** University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03062001)		\$390	\$3,090

Modern Engineering Design by Reliability and Mechanical Reliability Using the Stress/Strength Interference Approach

CEU: .5, Course Length: 5 Hours

Presenter: Dr. Dimitri Kececioglu, University of Arizona

Producer: University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03061602)		\$390	\$3,090

Applied Reliability and MTBF Growth Testing Techniques

CEU: .5, Course Length: 5 Hours

Presenter: Dr. Dimitri Kececioglu, University of Arizona

Producer: University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03061803)		\$390	\$3,090

Optimum Test Sample Size Determination with Allowable Error at a Desired Confidence Level

CEU: .5, Course Length: 5 Hours

Presenter: Dr. Dimitri B. Kececioglu, University of Arizona

Producer: University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03031302)		\$390	\$3,090

Very Time and Sample Size Efficient Applied Bayesian Reliability and MTBF Testing

CEU: .5, Course Length: 5 Hours

Presenter: Dr. Dimitri Kececioglu, University of Arizona

Producer: University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03061901)		\$390	\$3,090

Sample Size and Test Time Efficient Suspended Items and Sudden Death Testing, and Field Data Analysis Techniques for Reliability Determination

CEU: .5, Course Length: 5 Hours

Presenter: Dr. Dimitri Kececioglu, University of Arizona

Producer: University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03061603)		\$390	\$3,090

Sample Size and Test Time Efficient Sequential Testing for the Exponential Case, and Non-Parametric Testing

CEU: .5, Course Length: 5 Hours

Presenter: Dr. Dimitri Kececioglu, University of Arizona

Producer: University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03061703)		\$390	\$3,090

Applied Maintainability Engineering, Preventive Maintenance Scheduling and Their Optimization

CEU: .5, Course Length: 5 Hours

Presenter: Dr. Dimitri Kececioglu, University of Arizona

Producer: University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03061601)		\$390	\$3,090

How to Increase the Use and Production Availability of All Types of Equipment—Increased Productivity in Action

CEU: .5, Course Length: 5 Hours

Presenter: Dr. Dimitri Kececioglu, University of Arizona

Producer: University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03061802)		\$390	\$3,090

Quantification of the Optimized Spare Parts Provisioning to Minimize Equipment Operating Costs

CEU: .5, Course Length: 5 Hours

Presenter: Dr. Dimitri Kececioglu, University of Arizona

Producer: University of Arizona

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03061802)		\$390	\$3,090

Optics

Light-Emitting Diodes: Device Physics, Fabrication and Applications

CEU: 0.5, Course Length: 5 Hours

Presenter: Fred Schubert, Boston University

Delivery Method (10+)	Price:	Per Person	Per Site
Videotape (EN03022801)		\$465	\$3,840

Signal Processing

Applied Digital Filters

CEU: 0.4, Course Length: 4 Hours

Presenter: Dr. Jim S. Prater, National Semiconductor

Producer: National Technological University

Delivery Method	Price:	Per Person	Per Site (6+)
Videotape (EN03041502)		\$260	\$1,260

Digital Signal Processing and Filtering

CEU: 0.6, Course Length: 6 Hours

Presenter: Dr. Jim S. Prater, National Semiconductor

Producer: National Technological University

Delivery Method	Price:	Per Person	Per Site (6+)
Videotape (EN03021802)		\$439	\$2,184
Online (OL00091801)		\$349	N/A
CD-ROM (CD00091801)		\$379	N/A

