



MANHATTAN COLLEGE SCHOOL OF ENGINEERING



ANNOUNCEMENT PE and CONTINUING EDUCATION SESSIONS - 2007

The [School of Engineering](#) schedules a variety of continuing education hour sessions per year with each session worth four (4) CEHs of credit applicable to PE license registration or applicable to continuing education/professional development requirements. Successful completion of each of the Continuing Education sessions will earn the participant four (4) CEHs and a Certificate of Completion. Each session will include, at least, 240 to 255 minutes of contact including lecture, Q&A and a 15 minute break. Participants will receive course materials, as appropriate, for each session.

Schedules and Descriptions

CEH Session #1: Engineering Risk and Decision Analysis - 4 CEH

Instructor: Graham Walker, PhD, Professor of Mechanical Engineering
2:00pm to 6:15pm; March 23rd, 2007; Leo Engineering Building, Manhattan College

Overview

This session will present the analytical tools needed to make decisions using incomplete information under uncertain conditions and to assess the risk associated with different decision options. In the decision analysis portion of the course techniques such as Hurwitz's Rule, Minimax, and Opportunity Loss will be covered. More advanced solutions such as Trade-Off and Sensitivity Analyses will also be presented with respect to minimizing the risk associated with any particular decision choice. Finally, the issue of evaluating risk will be studied with a specific emphasis being placed on extreme events.

Price: \$135/session

CEH Session #2: Control Technologies - 4 CEH

Instructor: Thomas McKee, MS, Adjunct Professor of Electrical Engineering
2:00pm to 6:15pm; April 20th, 2007; Leo Engineering Building, Manhattan College

Overview:

SCADA or "Supervisory Control and Data Acquisition" systems are real-time industrial process control systems used to centrally monitor and control remote or local industrial equipment such as motors, valves, pumps, relays, etc. SCADA is used to control chemical plant processes, oil and gas pipelines, electrical generation and transmission equipment, manufacturing facilities, water purification and distribution infrastructure, etc. SCADA control systems are the computer equivalent of a person reading gauges and recording values on a clip board, or opening a breaker and operating a local disconnect when a schedule says it is time to do so. This session will define SCADA and explore the technology used to implement it in a number of industries. The legacy issues of SCADA, which leave it open to manipulation, will be discussed. A number of examples of SCADA system compromises will be presented. Finally, a number of solutions to SCADA vulnerabilities will be offered.

Price: \$135/session

Schedules and Descriptions (con't)

CEH Session #3: Ethics in Engineering - 4 CEH

Instructor: Angelo DeVito, MS, Adjunct Professor of Electrical Engineering
2:00pm to 6:15pm; May 18th, 2007; Leo Engineering Building, Manhattan College

Overview:

This session is organized into four 60-65 minute sections. The first section is devoted to a case study of the Ford Pinto and a review of ethical principles. During the second section the students develop their own class-wide code of engineering ethics and then compare it to the various codes within their engineering discipline. The third section that culminates the module is devoted to a case study of the fictional "Incident at Morales." The fourth class period is a study of the Space Shuttle Challenger Case. At the end of the session, students will have a better understanding of the need for and how to apply a professional code of ethics in dealing with situations requiring ethical choices.

Price: \$135/session

CEH Session #4: New Power Technologies I - 4 CEH (Prerequisite for New Power Tech. II)

Instructor: Angelo DeVito, MS, Adjunct Professor of Electrical Engineering
2:00pm to 6:15pm; June 1st, 2007; Leo Engineering Building, Manhattan College

Overview

This session, along with CEH Session #5, will enhance a participant's understanding of energy issues in the US today and, in particular, the availability and reliability of power systems. Successful completion of this and the succeeding session will enable participants to contribute to the planning, design, and operations associated with the delivery of energy to the community. Concepts within New Power Technologies I will include trends in: Fuel cells (basic design, power efficiency, power plant systems, advantages and disadvantages), storage batteries (issues with lead-acid batteries, advanced battery designs, comparisons of battery designs), and nuclear technology (nuclear power in the US, goals of new nuclear technologies, recent trends in nuclear power, new BWR design). In addition, energy resources for the future will be presented and discussed including: SMART power, technological requirements, energy information portal, superconductors, power delivery, and DC micro-grids.

Price: \$135/session

CEH Session #5: New Power Technologies II - 4 CEH (Prerequisite: New Power Tech. I)

Instructor: Angelo DeVito, MS, Adjunct Professor of Electrical Engineering
2:00pm to 6:15pm; June 29th, 2007; Leo Engineering Building, Manhattan College

Overview

A continuation of CEH Session #4, this session will increase understanding of energy issues in the US today and successful completion will enable participants to contribute to the planning, design, and operations associated with the delivery of energy to the community. Concepts in this session will focus on direct energy conversion and non-traditional generation of power and will include trends in: Geo-thermal energy; Solar (photovoltaic power technology and design, economics of photovoltaic power, resource assessment); Wind Power and Ocean Energy (principles and designs); Bio-mass Energy (attributes, current technology in the US, environmental issues); Hydrogen as a fuel; and, Magnetohydrodynamic and Electrodynamics power generation (principles and technology).

Price: \$135/session

Schedules and Descriptions (con't)

Topical Sessions ***Practical Forensic Metallurgy for Engineers*** **(CEH approval is pending)**

This is a series of 4–hour presentations on the metallurgical aspects of forensic root cause evaluation. Through the use of written text, pictures, videos and the hands-on examination of actual failure specimens, the presentations cover crystal structures and their formation; the properties of metals and how those properties are affected by manufacturing, fabrication and service conditions. The presentations listed below will prepare the participant to recognize failure mechanisms associated with overload, wear, and fatigue and by the study and practice of basic forensic investigative techniques, will enable the participant to perform root cause material failure evaluations. Subsequent presentations (to be announced later) will continue this theme by focusing on failure mechanisms associated with erosion, cavitation, and the various corrosion mechanisms.

Introduction to Materials – 4 CEH* (Note: this is required to take any of the three following)

Instructor: William Spataro, P.E., Consulting Specialist – Metallurgy, Welding, and Corrosion
8:00am to 12:15pm; August 2nd, 2007; Leo Engineering Building, Manhattan College

Overview

This session is organized into three parts: (1) Introduction to Materials which covers the basic crystal structure of metals; a discussion of how anomalies in the crystal structure of a metal can affect its properties; a description of the effect of alloying, thermal treatment and mechanical working on a metal's crystal structure and therefore its properties; and, a discussion of how dislocation movement affects properties of metals. (2) Properties of Metals which covers a description of the properties of yield strength, tensile strength, ductility, and toughness; and, a discussion of loading modes of tension, compression, torsion, and shear. (3) Processing of Metals which covers various metal fabrication methods: casting, forging, rolling, welding, drawing/extruding, and cladding; and, a description of the transformations that occur during annealing, normalizing, precipitation hardening, quenching, tempering and stress relieving.

Price: \$135/session

Service-Induced Damage Mechanisms - Overload Failures – 4 CEH*

Instructor: William Spataro, P.E., Consulting Specialist – Metallurgy, Welding, and Corrosion
8:00am to 12:15pm; August 9th, 2007; Leo Engineering Building, Manhattan College

Overview

This session will focus on overload failures. Tensile, shear and impact overload mechanisms will be described; differences between ductile, brittle and ductile/brittle nil-ductility transition temperature (NDTT) fracture mode will be discussed and demonstrated with tensile test, charpy impact test, dropweight test and high temperature gleeble tensile test specimens. Ductile behavior with flattening and flare test specimens; ductile overload failures with an impact punctured tube and stretched bolts; brittle overload failures with some stretched bolts, and fracture of a gray cast iron conduit will be discussed and demonstrated. In addition, ductile/brittle transition overload with and a through-thickness tear failure of a v-notched block will be discussed and demonstrated. Also, shear overload on a shear pin and a steel stud and nut will be discussed and demonstrated.

Price: \$135/session

Topical Sessions (con't)
Practical Forensic Metallurgy for Engineers
(CEH approval is pending)

Service-Induced Damage Mechanisms - Wear Failures – 4 CEH*

Instructor: William Spataro, P.E., Consulting Specialist – Metallurgy, Welding, and Corrosion
8:00am to 12:15pm; August 23rd, 2007; Leo Engineering Building, Manhattan College

Overview

This session will focus on wear failures. Properties of hardness and toughness and the relationship of varying degrees of hardness of faying surfaces with respect to wear will be described. Sliding (polishing) wear with a stainless steel pin and bushing assembly will be discussed and demonstrated. Gouging (galling) wear using severely gouged stainless steel pin and plug valve internals will be described and demonstrated. The effect of lubricity on wear of threaded parts with several different types of flame spray overlays and with uncoated and graphite coated threaded fasteners will be described and illustrated. Finally, the proper techniques for preserving damage evidence by the use of a plug valve specimen will be discussed.

Price: \$135/session

Service-Induced Damage Mechanisms - Fatigue Failures – 4 CEH*

Instructor: William Spataro, P.E., Consulting Specialist – Metallurgy, Welding, and Corrosion
8:00am to 12:15pm; August 30th, 2007; Leo Engineering Building, Manhattan College

Overview

This session will focus on fatigue failures. The difference between high stress/low cycle and low stress/high cycle fatigue will be discussed and an example will be presented involving a stainless steel/titanium replacement hip joint. The effect of mechanical and metallurgical notches on fatigue life with several threaded fasteners, a stud weld and a steam turbine blade group will be discussed and demonstrated. The cantilever effect on fatigue initiation will be discussed and examples will be provided involving several steel socket welds. Finally, fracture mechanics and fracture mechanics testing will be described along with a demonstration involving brittle and ductile compact tension specimens and J-integral test specimens.

Price: \$135/session

* CEH approval pending

End of Topical Sessions

Schedules and Descriptions (con't)

CEH Session #6: New Concrete Solutions to Bridge Decks - 4 CEH

Instructor: Seamus Freyne, PhD, PE, Assistant Professor of Civil Engineering
2:00pm to 6:15pm; September 7th, 2007; Leo Engineering Building, Manhattan College

Overview:

In 2005, the FHWA found that nearly 200,000 bridges or 30% of all bridges nationwide are inadequate and in a state of decline. Problems with the bridge decks were determined to be the most common cause of structural deficiency. A vital link to our nation's mobility and prosperity, these bridges will have to be repaired or replaced as soon as possible. Today's concrete contains a wide variety of cements, supplementary cementitious materials, aggregates, chemical admixtures, and fibers. This session will examine which of these concrete materials, and which mixture designs and construction practices are necessary to attain specific performance criteria such as ease of placement, volume stability, and improved durability. Thin concrete overlays will be shown to be an economical way to extend the life of concrete bridge decks by 10 years or more. A new ASTM test that can provide an assessment of the bond between the new and old concrete and may be useful as a guide to the kind of bridge deck repair that is necessary will be described.

Price: \$135/session

CEH Session #7: Pervious Concrete for Roadways - 4 CEH

Instructor: Seamus Freyne, PhD, PE, Assistant Professor of Civil Engineering
2:00pm to 6:15pm; September 28th, 2007; Leo Engineering Building, Manhattan College

Overview:

With the ability to make roadways less hazardous to the traveling public, reduce loads to storm water management systems, and exist harmoniously with the environment, pervious concrete may become the material of choice for our nation's roadways. Pervious concrete allows rainfall and snowmelt to easily pass through and replenish the aquifers below. Session content includes: description of pervious concrete and how it is produced; discussion of pervious concrete mix designs; construction practices (participants will have a chance to batch pervious concrete by hand); discussion of the properties of pervious concrete (e.g., voids content, strength); life cycle cost analysis of pervious concrete roadways and asphalt roadways; roadway hazards and pervious concrete; and a discussion of pervious concrete in the context of sustainable development (including how pervious concrete can recharge aquifers, improve the quality of unclean runoff, and help reduce the urban heat island effect). The session will also include a discussion of limitations of pervious concrete to date and a review of current research involving pervious concrete at Manhattan College and elsewhere.

Price: \$135/session

CEH Session #8: To Be Announced

Instructor: To be announced
2:00pm to 6:15pm; October, 2007; Leo Engineering Building, Manhattan College

Schedules and Descriptions (con't)

CEH Session #9: Surface Water Quality Management - 4 CEH

Instructor: Kevin Farley, PhD, Professor of Environmental Engineering

2:00pm to 6:15pm; November 30th, 2007; Leo Engineering Building, Manhattan College

Overview

This session will provide engineers and scientists with an overview of current water quality regulations and standards that are applicable to the management of lakes, reservoirs, rivers, and coastal waters. Water quality monitoring approaches, modeling assessment methods and management strategies will be presented for the development of Total Maximum Daily Loads (TMDLs) and CERCLA exposure assessments. As part of the discussions, specific examples of water quality modeling/assessment studies will be presented for nutrient enrichment in Long Island Sound, and for the accumulation of toxic organic contaminants in NY-NJ Harbor sediments and fish.

Price: \$135/session

CEH Session #10: Legal Aspects in Engineering - 4 CEH

Instructor: Peter Sweeney, Ph.D., P.E., Adjunct Professor of Civil Engineering

2:00pm to 6:15pm; December 7th, 2007; Leo Engineering Building, Manhattan College

Overview:

The work environment for practicing engineers has changed over time to the point where it is now essential that they have a basic understanding of the potential legal consequences of their technical actions and decisions as well as those of their employers. Four key areas will be covered in this session, namely: (1) Contract fundamentals applicable to Engineering Professional Services and publicly bid construction projects; (2) Standard of Care for Professional Engineers; (3) Property Rights both Intellectual (e.g. Patents and Design Copyrights) and Tangible (Land and Water Rights), and, (4) Regulatory activities of Federal administrative agencies such as the Environmental Protection Agency, Nuclear Regulatory Commission, and the Occupational Safety and Health Administration.

National (e.g., Hyatt Regency Hotel Collapse) and local (e.g. PANY&NJ, NYCSCA projects) examples and cases will be used to illustrate the relevance of major principles covered.

Price: \$135/session

ENROLLMENT INFORMATION

The cost of enrollment in these CEH Sessions is \$135/CEH-session. The session enrollment cost includes participation in the session (four CEHs), a Certificate of Completion, course materials, and light refreshments during the break periods. Please continue to visit the School of Engineering web site (www.engineering.manhattan.edu) for additional details and updates.

Please Note:

The School of Engineering also offers these topics and others (contact the School of Engineering for additional details) to groups (e.g., 10 or larger) of engineers on-site at individual companies. Arrangements for these on-site sessions need to be made through the [Dean's Office](#) in the School of Engineering.

Contact info: Dean's Office, School of Engineering;

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E-mail: deanengr@manhattan.edu

URL: www.engineering.manhattan.edu

Directions to the Leo Engineering Building are available at www.manhattan.edu