For the chemical, pharmaceutical, and food process industries

Pilot Plant Equipment

May 10–12, 2011
Charlotte, North Carolina

A course designed specifically for engineers, scientists, contractors, supervisors, and operators who specify and design equipment for pilot plant and laboratory units

Pilot Plant Equipment

- Receive a detailed overview of the common equipment used in pilot plants
- Focus on how this equipment is applied
- Learn how to select the right equipment for your pilot plant
- Examine different design alternatives

May 10–12, 2011
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Save time and money!
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Please route this brochure to colleagues who would also benefit by attending.
Examine Practical Concepts
This detailed course is designed for engineers, scientists, contractors, supervisors, and operators who specify, design, build, operate, or support equipment for pilot plant and laboratory units. You will
- gain a comprehensive overview of the equipment used in pilot plants
- examine different options available for your pilot plant
- learn how to select the right equipment to provide flexibility in your pilot plant
- examine how equipment impacts pilot plant layout and how layout affects equipment choices
- explore guidelines for minimizing wastes and costs.

Learn How To
- design, select, and troubleshoot critical pieces of pilot plant equipment
- establish guidelines for waste and cost minimization
- choose the best options to provide flexibility and reliability in your pilot plant.

Examine Pilot Plant Equipment
This course will focus on the hardware involved in pilot plants and the issues involved in correctly designing this equipment for use in pilot plants. The course will also cover the differences between pilot scale equipment and production equipment.

During the course, you will examine common pilot plant equipment, including
- piping
- reactors
- seals
- controls for reactors
- valves
- pumps
- sampling systems
- heat tracing
- drivers.

For each category of equipment, you will discuss selection and installation issues and explore troubleshooting methods and options.

Attend and Benefit
Engineers and scientists who are involved in pilot plant design and construction and the specification of pilot plant equipment will learn the essentials and critically examine options involved in equipment selection and design. The trade-offs between equipment choices and pilot plant layout will be explored. The course will be especially valuable to those involved in designing, building, and operating pilot plants in the following industries:
- chemical, petrochemical, agrichemical, and specialty chemical
- biotechnology, biochemical, and fermentation
- pharmaceuticals and cosmetics
- food processing.

This course will be especially valuable to those who are
- new to the pilot plant
- designing pilot plants
- selecting equipment for pilot plants
- managing pilot plants
- operating pilot plants.

The novice will be brought up to speed quickly and will benefit from the breadth and detail of the course. More experienced personnel will find the overall approach and breadth will help them better understand the complex interrelations between all of the different areas.

Explore Critical Issues
This course provides information that you can put to work immediately, including
- the basics of piping design and selection
- the fundamentals of reactor design as it relates to pilot plant operation and equipment
- selection criteria and installation recommendations for pilot plant equipment, including
  - seals
  - pumps
  - heat tracing
  - drivers
- troubleshooting guides for pilot plant installations.

For Related Course Descriptions
http://epd.engr.wisc.edu/chemicaleng

Your Instructor
Richard P. Palluzi is a Distinguished Engineering Associate at ExxonMobil Research and Engineering, where he is responsible for the design, construction, and support of pilot plants and laboratories for ExxonMobil’s research site in Clinton, New Jersey. He also is a consultant on issues related to pilot plants throughout ExxonMobil worldwide. He has a bachelor of engineering degree and a master of engineering degree in chemical engineering from Stevens Institute of Technology. He is the author of two books, 30 articles, and 40 presentations on all phases of pilot plant and laboratory safety and operations. He is a past chair of the AIChE Pilot Plant Committee and the Clinton site’s Safe Operations Team and was responsible for reviewing and approving all pilot plant and laboratory installations and operations. He currently chairs ExxonMobil’s Pilot Plant and Laboratory Safety Standards Committee and is responsible for the development and dissemination of more than 100 internal company standards on pilot plant design and construction. He has consulted for the Department of Energy and the Department of Defense on research-related issues. Rich is a member of the American Institute of Chemical Engineers, the Instrument Society of America, the American Society of Safety Engineers, and the National Fire Protection Association, where he serves on the committees on NFPA-45 Fire Protection for Laboratories Using Chemicals and NFPA-55 Industrial and Medical Gases.
Important Course Topics

Welcome and Introduction
Elaine M. Bower
Program Director
Department of Engineering Professional Development
University of Wisconsin–Madison

Piping Basics
• General piping overview
• Welded pipe
• Flanged pipe
• Specialty couplings
• Compression fittings
• Sweat/brazed
• Other

Pilot Plant Layout
• General consideration
• General layouts
• Restricted area layouts

Reactor Design
• Pressure rating
• Reactor closures
• Thermocouple placement

Seal Types
• Packing
• Single mechanical seal
• Double mechanical seal
• Sealless
• Guidelines for proper seal selection
• Seal installation tips

Pump Selection and Installation
• Centrifugal
• Metering
• Progressive cavity
• Tubing
• Diaphragm
• Sliding vane
• Flexible impeller
• Turbine
• Guidelines for effective pump installation
• Pump selection criteria

Drivers
• Air
• Electric
• Hydraulic
• Selecting the best drive

Related Courses

Pilot Plant Design, Construction, and Operation
Fall 2011
Gain a comprehensive overview of all aspects involved in bringing a pilot plant to life, including defining the function of the pilot plant; cost factors; design; space requirements; control systems; safety and start-up; and maintenance.

Pilot Plant and Laboratory Safety
April 2011
Learn how to develop and implement an effective safety program for your labs and pilot plants. You will gain a comprehensive overview of applicable safety codes, including OSHA, NFPA, and ASME; flammability basics and how they influence safety and safety programs; safety systems and interlocks; and gas monitoring systems.

Laboratory Design for Owners, Designers, and Engineers
Fall 2011
Gain a working knowledge of laboratory design for functionality; laboratory use requirements; codes and regulations that impact laboratory design; renovation as an alternative to new construction; and general laboratory safety issues.

For more information, contact Elaine Bower, Program Director, at 800-462-0876 or e-mail her at bower@engr.wisc.edu.

Enroll as a Team
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Future Courses

For information about the following courses, contact Elaine Bower, Program Director, at 800-462-0876 or e-mail her at bower@engr.wisc.edu

Successful Liquid Mixing Scale-up Methods
January 11–13, 2011
Course #M405

Pumps and Process Piping
January 25–26, 2011
Course #M431

Hazard Analysis and Risk Assessment
February 23–24, 2011
Course #M449

Spray Dryer Absorbers: Fundamentals and Practice
March 1–2, 2011
Course #M481

Chemical Engineering for Non-Chemical Engineers
March 14–16, 2011
Course #M432

The Art and Science of Industrial Mixing
April 5–7, 2011
Course #M587

Dryer Technology
April 11–12, 2011
Course #M450

Atomization and Spray Technology
April 13, 2011
Course #M451

Evaporators: Designing, Evaluating, and Operating
May 3–4, 2011
Course #M463

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• At reduced per-person cost
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To inquire about this on-site course or other courses that we can bring to your site, call 800-462-0876 and ask for program director Elaine Bower. Or see http://epd.engr.wisc.edu/onsite/

Need to Know More?

Call toll free 800-462-0876 and ask for

Program Director: Elaine M. Bower
bower@engr.wisc.edu

Program Associate: Theresa Rodger
rodger@epd.engr.wisc.edu

Or e-mail custserv@epd.engr.wisc.edu

General Information

Fee of $1795 Covers Notebook, course materials, break refreshments, lunches, and certificate. We do not publish proceedings. Course materials are distributed only to participants.

Cancellation If you cannot attend, please notify us by May 3, 2011, and we will refund your fee. Because this course has limited enrollment, cancellations received after this date and no-shows are subject to the full course fee of $1795. You may enroll a substitute at any time before the course starts.

Location and Accommodations This course will be held at the Hilton Charlotte University Place, 8629 JM Keynes Drive, Charlotte, North Carolina 28262. We have reserved a block of sleeping rooms ($142.95/single or double) for course participants at the Hilton Charlotte University Place. To reserve a room, call 800-hiltons by April 11, 2011 and indicate that you will be attending this course under group code PPE. Rooms requests made later than April 11 will be subject to availability.

Earn Continuing Education Credits By participating in this course, you will earn 2.0 Continuing Education Units (CEU) or 20 Professional Development Hours (PDH).