

SELF-STUDY COURSES

This is a listing of self-study courses available for the powder and bulk solids industry. We welcome your suggestions for self-study courses not listed here and will include applicable information in our next *Reference & Buyer's Resource* issue. Contact Kayla Carrigan, Senior Editor, *Powder and Bulk Engineering*, 1155 Northland Drive, St. Paul, MN 55120; 651-287-5630 (kcarrigan@cscpub.com).

BULK SOLIDS HANDLING & PROCESSING

Introduction to Compressed Air Systems (Smart Site). Offered by the Compressed Air and Gas Institute (CAGI). Coursework consists of 8 modules and covers compressed-air basics; types of compressors, capacity controls, and distribution systems; how to control wastes; and air system maintenance. Contact John Addington, 216-241-7333 (cagi@cagi.org, www.cagi.org).

CERAMICS

Ceramic Manufacturing Technology. Offered by The American Ceramic Society (ACerS). Online course provides in-depth coverage of all segments of ceramic manufacturing in 5 modules consisting of 30 lessons total. Module topics include introduction to products, raw materials, and compositions; special manufacturing technology and processes; and the ceramic manufacturing environment. Contact ACerS customer service, 614-890-4700 (customerservice@ceramics.org, ceramics.org).

Dispersion and Rheology Control for Improved Ceramic Processing. Offered by The American Ceramic Society (ACerS). Online course contains 6 lessons to better understand the variables that control suspension properties, the analytical tools needed to decipher defect causes, and the background to troubleshoot manufacturing problems. Course introduces the five factors that control suspension rheology with examples. Contact ACerS customer service, 614-890-4700 (customerservice@ceramics.org, ceramics.org).

Drying of Ceramics. Offered by The American Ceramic Society (ACerS). Course consists of 3 units that cover the ceramic drying process and how to control it with different dryer types and the psychrometry of humid air mixtures and related drying charts. Course teaches those involved in ceramic processing where drying is required the "why" and "how to control" elements of drying operations. Contact ACerS customer service, 614-890-4700 (customerservice@ceramics.org, ceramics.org).

Introduction to Ceramic Science, Technology, and Manufacturing. Offered by The American Ceramic Society (ACerS). Course has 5 modules consisting of 27 lessons total that cover an introduction to ceramic science; ceramic manufacturing technology; the ceramic industry; evaluation and process control; and challenges, opportunities, and the future of ceramics. Course is for those who need a foundational understanding of ceramic materials, manufacturing, and applications. Contact ACerS customer service, 614-890-4700 (customerservice@ceramics.org, ceramics.org).

Introduction to Refractory Compositions. Offered by The American Ceramic Society (ACerS). Online course consists of 4 3-hour lectures and addresses most of the significant refractory chemical compositions, emphasizing raw materials, phase relationships, processing, and microstructural property relationships. Course includes postmortem analyses from industrial applications. Contact ACerS customer service, 614-890-4700 (customerservice@ceramics.org, ceramics.org).

Statistical Process Control in Ceramic Processing. Offered by The American Ceramic Society (ACerS). Course provides an introduction to statistical process control (SPC) and its application to ceramic processing to lower losses, improve productivity, lower production costs, improve product quality, and improve profits. Modules include a total of 16 lessons divided into two sections: one statistics and SPC and another on applying SPC to ceramic and glass processing. Contact ACerS customer service, 614-890-4700 (customerservice@ceramics.org, ceramics.org).

FOOD & FOOD PROCESSING

Cookie and Cracker Entry-Level Training. Offered by the American Bakers Association for its members. Web-based training is offered in English or Spanish to individuals with little or no experience in a bakery environment. Training consists of 4 lessons: ingredients, mixing, forming, and baking. Students have access to a glossary of terms and can print a completion certificate upon successfully passing each lesson. Contact Vanessa Vial, 202-789-0300 ext. 127 (vvial@americanbakers.org, www.americanbakers.org/cca).

Cookie and Cracker Manufacturing Course (Second Edition). Offered by the American Bakers Association for its members. Advanced course's flexible pace allows up to 2 years for completion. Course provides an understanding of the science and theory underpinning effective cookie and cracker manufacturing process and operations and how the various parts of the operation interact with one another. Course includes testing and work projects. Contact

Vanessa Vial, 202-789-0300 ext. 127
(vvial@americanbakers.org, www.americanbakers.org/ccca).

Fundamentals of Confectionery Science and Technology — Module 1: Sugar Confections. Offered by the University of Wisconsin–Madison department of engineering professional development. Course topics include an overview of sugar and corn syrup chemistry and phase transitions; physical and chemical properties of sweeteners; crystallization principles; applications, including hard candies, fondants, creams, tablets, lozenges, caramel, fudge, and toffee; and factors impacting sugar confections' quality and shelf life. Contact Douglas T. Reindl, 800-462-0876 (dreindl@wisc.edu, www.epd.wisc.edu).

Fundamentals of Confectionery Science and Technology — Module 2: Stabilized Confections. Offered by the University of Wisconsin–Madison department of engineering professional development. Course topics include an introduction to hydrocolloid chemistry; the role of stabilizers; processing principles; applications, including chewing and bubble gum, gummies and jellies, aerated candy, and sugar panning; and the relationship between hydrocolloids and both the texture and quality of stabilized confections. Contact Douglas T. Reindl, 800-462-0876 (dreindl@wisc.edu, www.epd.wisc.edu).

Fundamentals of Confectionery Science and Technology — Module 3: Chocolates. Offered by the University of Wisconsin–Madison department of engineering professional development. Course topics include an introduction to fats, oils, and emulsifiers; the physical and chemical properties of lipids; chocolate and chocolate coatings; principles of processing chocolates; the science of chocolates — particle size and flavor, viscosity, fats and tempering, and panning; and troubleshooting chocolates. Contact Douglas T. Reindl, 800-462-0876 (dreindl@wisc.edu, www.epd.wisc.edu).

MATERIALS

Aluminum and Its Alloys. Offered by ASM International's Materials Engineering Institute (MEI). Course consists of 15 lessons, including an introduction to aluminum, extractive metallurgy, solidification and phase diagrams, aluminum alloy systems,

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aluminum casting principles and practice, hot- and cold-working aluminum alloys, and more. Contact ASM customer service, 440-338-5151 (memberservicecenter@asminternational.org, www.asminternational.org).

Corrosion. Offered by ASM International's Materials Engineering Institute (MEI). Course consists of 12 lessons focused on understanding corrosion, including how to recognize and define corrosion problems, how to develop and implement corrosion-control programs, and corrosion test methods and results interpretation. Contact ASM customer service, 440-338-5151 (memberservicecenter@asminternational.org, www.asminternational.org).

Elements of Metallurgy. Offered by ASM International's Materials Engineering Institute (MEI). Course includes 14 lessons consisting of an intensive introduction to the principles of metallurgy and its practical application in various fields of metals and alloy production, testing, and manufacturing processes, including an understanding of ore extraction, metalforming, phase diagrams, corrosion, and heat treating. Contact ASM customer service, 440-338-5151 (memberservicecenter@asminternational.org, www.asminternational.org).

Fundamentals and Applications of Powder Metallurgy. Offered by ASM International's Materials Engineering Institute (MEI). Course consists of 15 lessons and includes a powder metallurgy handbook. Topics include products and processing overview, powder production and characterization, compacting, sintering, porous materials, hot consolidation of metal powders, and powder metallurgy applications. Contact ASM customer service, 440-338-5151 (memberservicecenter@asminternational.org, www.asminternational.org).

Nickel and Nickel Alloys. Offered by ASM International. Course consists of 14 lessons providing an overview of nickel alloys and their use and an explanation of why nickel and its alloys are better than ferrous materials for specific applications. Contact ASM customer service, 440-338-5151 (memberservicecenter@asminternational.org, www.asminternational.org).

Stainless Steels. Offered by ASM International. Course consists of 15 lessons covering the physical metallurgy of stainless steels; properties of austenitic, martensitic, and ferritic stainless steels; heat- and corrosion-resistant alloy casings; properties of precipitation-hardening steels; heat treating; forging, machining, cleaning, and finishing; cold forming; deep drawing; metallurgy of welding stainless steels; joining stainless steels; corrosion of metals; corrosion resistance of stainless steels; and stainless steels at high temperatures. Contact ASM customer service, 440-338-5151 (memberservicecenter@asminternational.org, www.asminternational.org).

PACKAGING

Basic Electrical Components. Offered by the Packaging Machinery Manufacturers Institute University (PMMI U). Course introduces the principles of electricity and explains the electrical components found on packaging machinery and the function behind each. Course also covers preventive maintenance and identifying failures and malfunctions in components. Contact Stephan Girard, 571-612-3200 (sgirard@pmmi.org, www.pmmiu.org).

Basic Mechanical Components. Offered by the Packaging Machinery Manufacturers Institute University (PMMI U). Course consists of 12 lessons for operators, mechanics, and technicians about the basic mechanical components found on packaging lines. Each lesson concentrates on the functionality and purpose of an essential component, including bearings, belt drives, gears, shafts, springs, and timing screws. Contact Stephan Girard, 571-612-3200 (sgirard@pmmi.org, www.pmmiu.org).

The Fundamentals of Risk Assessment. Offered by the Packaging Machinery Manufacturers Institute University (PMMI U). Course introduces the risk assessment process and explains the iterative risk assessment process and why it's effective for risk management. Course features an interactive exercise using a software tool to perform risk assessments. Contact Stephan Girard, 571-612-3200 (sgirard@pmmi.org, www.pmmiu.org).

Introduction to Packaging

Machinery. Offered by the Packaging Machinery Manufacturers Institute University (PMMI U). Course consists of 14 modules and teaches packaging machinery functions and operations and the interaction of machines with product characteristics, package design, and packaging materials. Contact Stephan Girard, 571-612-3200 (sgirard@pmmi.org, www.pmmiu.org).

Troubleshooting Packaging

Machinery. Available in English and Spanish. Offered by the Packaging Machinery Manufacturers Institute University (PMMI U). Course presents entry-level theory, process, and logic of troubleshooting packaging machinery. Course is designed to help technicians improve observation, thinking, and communication skills. Contact Stephan Girard, 571-612-3200 (sgirard@pmmi.org, www.pmmiu.org).

SAFETY

Combustible Dust Fundamentals

(NFPA 652). Offered by Dekra North America. Computer-based training course exposes the hazards associated with handling and processing combustible dust, including how to spot potential ignition sources during operation caused by electrical sparks, friction, and electrostatics. Contact Robin Angelini, 609-799-4449 (process-safety-usa@dekra.com, www.dekra-process-safety.com).

Confined Space Entry — Permit Required.

Available in various languages. Offered by the Health & Safety Institute (HSI). Online course educates employees on recognizing the difference between permit-required confined space and a non-permit-required confined space and identifying hazard controls that must be implemented. Contact HSI, 800-447-3177 (customerservice@hsi.com, hsi.com).

Fall Protection.

Offered by the Health & Safety Institute (HSI). Online course covers the correct selection, use, and care of fall protection equipment; when fall-arrest equipment is necessary; and the recognition and prevention of fall hazards. Contact HSI, 800-447-3177 (customerservice@hsi.com, hsi.com).

Industrial Ergonomics. Offered by the Health & Safety Institute (HSI). Online course covers proper

ergonomic safety practices for the prevention of musculoskeletal disorders (MSDs) and injuries. Topics include a definition of MSDs, factors that cause MSDs, and preventive measures. Contact HSI, 800-447-3177 (customerservice@hsi.com, hsi.com).

Intro to Combustible Dust Hazards.

Offered by the Health & Safety Institute (HSI). Course defines combustible dust and its source as it relates to industry, helps to identify ignition sources, and provides information on recognizing combustible dust dangers and applying explosion prevention methods. Contact HSI, 800-447-3177 (customerservice@hsi.com, hsi.com).

Lockout/Tagout.

Available in English and Spanish. Offered by the Health & Safety Institute (HSI). Program provides employees with an overview of lockout/tagout procedures. Contact HSI, 800-447-3177 (customerservice@hsi.com, hsi.com).

NFPA 654: Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids (2013) Online Training Series.

Offered by the National Fire Protection Association (NFPA). Online course introduces the hazards posed by combustible dust and how to use the NFPA 654 standard correctly. Course is 3 hours and covers the fundamental principles of the solids combustion process. Contact NFPA customer service, 800-344-3555 (custserv@nfpa.org, www.nfpa.org).

Process Safety Management.

Offered by the Health & Safety Institute (HSI). Video course covers 14 elements of process safety management, including the use, storage, manufacture, and handling or on-site movement of highly hazardous chemicals. Topics include process safety information, process hazard analysis, managing change, operating procedures, incident investigation, and more. Contact HSI, 800-447-3177 (customerservice@hsi.com, hsi.com).

Valve Safety.

Offered by the Health & Safety Institute (HSI). Online course focuses on recognizing different valve types, identifying common valve hazards, step-by-step valve risk assessment, ergonomic issues related to valve safety, and best safety practices for working with valves. Contact HSI, 800-447-3177 (customerservice@hsi.com, hsi.com).