COBBLESTONE

COURSE ID 2845

Mixing Technology

Fundamentals and Applications

DIRECTED BY

Herberto Dutra, Engineering

90 MINUTE

ACCREDITED COURSE

- Scaling up from Laboratory to Pilot Plant
- Applications to Various Industries
- Troubleshooting
- Case Studies

about the course

This 90-minute training program, developed by industry experts, covers the fundamentals of mixing and their practical applications in various commercial operations. The lectures will provide a comprehensive understanding of turbulence, emulsions, rheology, and interfacial phenomena, considering the latest research and industry practices. The course will analyze mixing processes for single-phase systems with low and high viscosity, as well as complex rheology, in addition to examining solid/liquid, gas/liquid, and liquid/liquid systems (including interfacial phenomena). Participants will gain insight into the design and performance of mixing equipment, as well as scale-up issues.

This training will provide numerous examples of mixing and scale-up in different industries, including food, beverages, pharmaceuticals, and chemicals. The sessions will include interactive discussions of participant-provided problems, as well as question-and-answer sessions to enhance understanding.

Experience top-notch training LIVE from an industry expert that goes beyond traditional lectures. You will engage in an interactive and stimulating learning experience that will help you develop the skills you need to excel in your field.

Those attending the LIVE training event must have a webcam on their computer equipped with a microphone and speakers/headset to fully participate.

who should attend

This course is for individuals in process industries such as oil, petrochemical, pharmaceutical, specialty chemical, cosmetic, mineral, environmental, polymer, biological, food and paper where mixing or formulation (often of complex materials) is undertaken in stirred vessels or other mixing equipment.

These professionals include, but are not limited to:

- Chemists
- Pharmacists
- Biologists
- Engineers
- Formulation Scientists
- Material Scientists

The course will benefit those concerned with scale-up, design, development, research, or production.

learning objectives

Upon completion of this course, you will be able to:

- Explain the goals and objectives of mixing processes in various industries
- Describe the various fluid characteristics – Newtonian and Non-Newtonian based on their rheological characteristics
- Design proper methods of batching and metering systems, to achieve top manufacturing performance and operational efficiencies
- Explain the various types of blending technologies for liquid-liquid, liquid-powders, liquid-gas applications
- Select the most optimal mixing solution for the process application
- Identify and troubleshoot operational problems in mixing processes
- Scale-up from labs and pilot plant settings to the production floor

course outline

Review of Learning Objectives

Module 1: Fundamentals

- Mixing systems in the process industries
- Newtonian Vs. Non-Newtonian Fluids – Rheology
- Emulsions and colloids
- Powder handling and mixing technology
- Powder dispersion and mixing in liquid media
- Gases-Powder mixing: Fluidization
- Gases solubility in liquids
- Scalability of mixing systems

Module 2: Applications and Troubleshooting

- Selection of the optimal liquid mixing system
- Troubleshooting techniques for issues in mixing systems. Part I: Liquid-Liquid
- Troubleshooting techniques for issues in mixing systems. Part II: Powder-Powder
- Troubleshooting techniques for issues in mixing systems. Part III: Liquid-Powder
- Scaling up from the pilot plant to production

Module 3: Case Studies

- Case study 1: Mixing cycle time reduction depending on the selection. Dairy beverage plant
- Case study 2: Product with a broad range of particle sizes and bulk density in the formula
- Case study 3: Gum dispersion in liquids

Question and Answer Session

Assessment Opportunity

course instructor

Herberto Dutra is a Mechanical Engineer with over 30 years of experience in processing industries with careers at Kraft Foods, Nestle, Bay Valley, and Sensient, including 20 years of hands-on experience in multiple industrial processes including Dairy, Spray Drying, Industrial Batching / Mixing, Extrusion, Beverages, Chocolate, Confections, Bakery, Packaging, etc.

Mr. Dutra's expertise ranges from pilot plant scaling up, design and construction of numerous industrial processes, day-to-day operation, troubleshooting, and optimization. Academically, Mr. Dutra holds a bachelor's degree in mechanical engineering from UERJ (Rio de Janeiro, Brazil), an MBA from Keller Graduate School, and a Master's in Mechanical Engineering from Purdue University.

Through his employers, Mr. Dutra has written and taught many training courses in Spray Drying, Powder Handling, Agglomeration, Liquids Handling, Cooking Processes, Plant Design, Packaging, and many other programs developed for operations professionals, engineering, scientists, etc."

Accreditations

International Accreditors for Continuing Education and Training (IACET)
Cobblestone has been approved as a CEU Accreditor by IACET and awards CEUs for participation in qualified courses. Cobblestone has demonstrated that it complies with the ANSI/IACET Standards and is authorized to offer IACET CEUs for its programs. CEUs will be awarded for participation in Cobblestone's courses at the rate of .1 CEU per contact hour upon successful completion of the entire course and 70% accuracy in the required Learners' Assessment. A minimum score of 80% is required for all courses within a Cobblestone Certification Program. This course offers a total of 1.5 contact hours or .2 CEUs. For further information, visit www.iacet.org