

Engineering Fundamentals for Technical Professionals

Course Description

This course introduces basic engineering concepts to technical professionals who have no formal academic engineering background. The overall goal of the course is to give participants enough exposure to the engineering fundamentals so that they can contribute effectively projects and ventures requiring a working understanding of process and product development, chemical entity and medical device manufacturing, construction and start-up of new laboratory and manufacturing facilities and evaluation of chemical and device manufacturing technologies. The course

- Presents a unit operations based approach to problem solving particularly applicable to refining and pharmaceutical manufacturing / process development and medical devices,
- Applies engineering process fundamentals to real problems encountered in chemical entity and medical device manufacturing, product and process development, validation and the implementation of process technology and/or start-up / improvement of commercial facilities,
- Provides a catalog of solutions to real problems in process engineering that serve as reference material for course participants back in their home industries, and
- Highlights cost and cost of manufacture as important components to be considered in the daily practice of process and device engineering.
- Emphasizes practice and application rather than theory and calculation and sets time aside for problem worksheets to illustrate the fundamentals and allow participants to apply what they have learned immediately to a practical problem.

Program Outline (3 day format) Select from a variety of topics, for example,

The Profession of Engineering	Overview of Manufacturing Processes
Inorganic Chemistry and Materials Science	Organic Chemistry and Biochemistry Overview
Total and Component Material Balances	Steady State and Continuous Systems
Energy Balances	
Cell Doctrine and Growth Kinetics	Microbial Product Synthesis
Kinetics of Cell Death and Sterilization	Sanitary Design and Aseptic Processing
Hydraulics and Fluid Flow	Laminar and Turbulent Flow
Pumps and Piping System Design	Clean Room Design and Operation
Heat Transfer by Conduction and Convection	Heat Exchanger Design, Specs and Operation
Chemical Engineering Separations Science	Depth and Tangential Flow Filtration
Solids/Liquid Separation by Centrifugation	
Mass Transfer Fundamentals and Equilibrium	Extraction and Chromatography
Distillation and Other Methods	

Solids Concentration by Evaporation	Solids Concentration by Drying
Solids Handling, Properties and Movement	Flow Regimes and Fluidized Beds
Solids Transfer Systems and How They Work	Tableting, Pilling, and Other Pharma Applications
Chemical Reaction Kinetics	Stirred Tank and Plug Flow Reactors and Design
Bioreactors and Aerobic Fermentation	Mass and Heat Transfer in Bioreactors
Manufacturing Plant Utilities	Planned and Preventative Maintenance
Process Integration and Optimization	Plant Design
Process Techno-econometrics	

Planning Your Program

- 1) Contact Far Sight Skills Development today to plan your in-house program.
- 2) Dale will work with you to develop a unique syllabus to meet your specific needs and participant profile. The three-day program can be abridged to focus on a smaller number of topics (for example emails or oral presentation) should that better met the sponsor's business need.
- 3) Let's set the time and place (!)

About your Course Director

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