MAWA EVENTS

Address: No. 857, Block A2. Leisure Commerce Square - No 9., 46150 Petaling Jaya, Selangor, Malaysia

Phone: +601116373203 | **Email:** info@mawaevents.net

CHEMICAL ENGINEERING FOR NON-CHEMICAL ENGINEERS

"Demystifying Chemical Processes for Better Technical, Operational, and Business Decisions"

Schedule

Date	Venue	Fees (Face-to-Face)
07 – 11 Sep 2026	London – UK	USD 3495 per delegate

► **Available delivery methods:** Face-to-Face & Online Training

Introduction

Chemical engineering underpins a vast range of industrial processes, from oil refining to pharmaceuticals to food production. However, professionals without a chemical engineering background often struggle to engage effectively with these systems due to technical jargon and complex process concepts.

This 5-day practical course bridges the knowledge gap by equipping non-chemical engineers with a foundational understanding of chemical engineering principles, unit operations, and industrial process behavior. Participants will gain the confidence to interpret technical data, communicate with engineers, and contribute meaningfully to multidisciplinary projects.

Objectives

By the end of this course, participants will be able to:

- Understand key concepts in chemical engineering, including mass and energy balances
- Recognize and describe major unit operations such as distillation, heat exchange, and fluid flow
- Interpret process diagrams (PFDs, P&IDs) and engineering documentation
- Communicate effectively with chemical engineers and technical teams
- Apply chemical engineering fundamentals to real-world operational or business challenges

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Why Attend

- Gain working knowledge of chemical process industries without needing an engineering degree
- Understand how chemical plants work and how processes are controlled
- Learn the language of chemical engineering to bridge communication gaps in project teams
- Strengthen decision-making by understanding process limitations and capabilities
- Participate more confidently in design reviews, HAZOPs, and process meetings

Target Audience

This program is designed for:

- Operations, project, and maintenance professionals in chemical or process industries
- Technical sales and marketing staff supporting industrial clients
- Procurement and contract personnel managing technical scopes
- Health, safety, and environmental professionals
- Business analysts, finance professionals, and non-engineering managers working with engineers

Individual Benefits

Key competencies that will be developed include:

- Understanding the principles of mass, energy, and momentum transfer
- Ability to read and interpret piping and instrumentation diagrams (P&IDs)
- Familiarity with core process equipment such as reactors, pumps, and separators
- Improved collaboration with engineering and operations teams
- Confidence in participating in technical discussions and reviews

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Better cross-functional communication between engineers and non-engineers
- Faster decision-making through broader technical understanding
- Reduced project delays and rework from misaligned expectations
- Enhanced risk awareness in process safety and operations
- Increased internal capability to support engineering-led initiatives

Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Strategy Briefings – Simplified but thorough explanations of key chemical engineering topics
- Case Studies – Real-world industrial process challenges and solutions
- Workshops – Hands-on sessions involving process flow diagramming and calculations
- Peer Exchange – Team discussions to apply concepts in cross-functional scenarios
- Tools – Glossaries, formula sheets, flow diagram templates, and cheat sheets

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Course Outline

DETAILED 5-DAY COURSE OUTLINE

Training Hours: 7:30 AM – 3:30 PM Daily Format: 3–4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Introduction to Chemical Engineering Concepts

- Module 1: Chemical Engineering Overview (07:30 – 09:30) • What is chemical engineering and how is it applied? • Key disciplines: thermodynamics, fluid mechanics, heat and mass transfer • Overview of the chemical process industry
- Module 2: States of Matter and Material Balances (09:45 – 11:15) • Solids, liquids, gases: properties and behavior • Mass conservation and simple mass balance problems • Units, conversions, and dimensional analysis
- Module 3: Energy and Heat Balances (11:30 – 01:00) • Energy forms: heat, work, potential, internal • Introduction to energy balances and the first law of thermodynamics • Heat capacity and latent heat
- Module 4: Workshop – Solving Mass/Energy Balance Problems (02:00 – 03:30) • Mass balance around a mixing process • Heat balance for a simple heat exchanger • Group presentations of results

Day 2: Fluid Flow and Heat Transfer Applications

- Module 1: Principles of Fluid Flow (07:30 – 09:30) • Laminar vs. turbulent flow • Flow rate, pressure drop, and velocity • Pipes, pumps, and valves
- Module 2: Pumps and Compressors (09:45 – 11:15) • Types and selection criteria • Pump curves and system curves • Troubleshooting and efficiency considerations
- Module 3: Heat Transfer and Heat Exchangers (11:30 – 01:00) • Conduction, convection, radiation • Heat exchanger types and applications • Heat transfer equations (conceptual focus)
- Module 4: Workshop – Fluid and Heat Flow Simulations (02:00 – 03:30) • Flow in a process loop • Sizing exercise for a basic heat exchanger • Process visualization activity

Day 3: Separation Processes and Unit Operations

- Module 1: Distillation and Evaporation (07:30 – 09:30) • Phase equilibrium and vapor-liquid separation • Distillation columns: operation and components • Batch vs. continuous systems
- Module 2: Filtration, Extraction, and Crystallization (09:45 – 11:15) • Key separation principles and equipment • Applications in food, pharma, and petrochemicals • Tradeoffs in design and operation
- Module 3: Process Reactors and Reaction Kinetics (11:30 – 01:00) • What happens inside a reactor? • Reaction rate concepts and reactor types • Safety and efficiency considerations
- Module 4: Workshop – Unit Operations Matching Game (02:00 – 03:30) • Matching equipment to process goals • Design review of a simple process plant • Group discussion on operations and bottlenecks

Day 4: Process Control, Safety, and Diagrams

- Module 1: Introduction to Process Control (07:30 – 09:30) • What is control and why is it critical? • Basic control loop elements: sensors, controllers, actuators • Feedback vs. feedforward control
- Module 2: Safety and Process Hazards (09:45 – 11:15) • Pressure, temperature, and flow risks • Relief systems and containment • Basic hazard identification (HAZID) concepts
- Module 3: Reading Process Flow Diagrams (PFDs) and P&IDs (11:30 – 01:00) • Symbols, conventions, and interpretation • Layout of a process system • Identifying key equipment and lines
- Module 4: Workshop – P&ID Review Activity (02:00 – 03:30) • Reviewing a sample P&ID • Tracing a process line • Identifying control elements

Day 5: Integrated Process Understanding and Applications

- Module 1: End-to-End Process Review (07:30 – 09:30) • Raw materials to final product • Integration of unit operations • Process bottlenecks and optimization

- Module 2: Industry Applications and Sector Overviews (09:45 – 11:15) • Chemical, petrochemical, pharma, food, and water industries • Role of chemical engineering in sustainability • Digital transformation and automation
- Module 3: Final Project and Case Study (11:30 – 01:00) • Team challenge: build a conceptual process • Define flows, equipment, and critical issues • Prepare a simplified process diagram
- Module 4: Presentations and Course Wrap-Up (02:00 – 03:30) • Group project presentations • Recap of key takeaways • Certification and feedback

Certification

Participants will receive a Certificate of Completion in Chemical Engineering for Non-Chemical Engineers, confirming their understanding of fundamental chemical engineering concepts and their ability to engage in process-related discussions and decisions.

Why Choose MAWA Events

- **Global Expertise:** More than 17 years of experience in professional training and consulting.
- **Industry-Leading Faculty:** Courses delivered by seasoned professionals with hands-on experience.
- **Practical Insights:** Learn to turn theory into actionable strategies for real-world business impact.
- **Client-Focused Solutions:** Customized programs designed to achieve your organisation’s unique goals.

In-House / Customized Training Interested in running this course for your team? Please contact us:	TEL: **+601116373203**	EMAIL: **info@mawaevents.net**