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COURSE BROCHURE

Chemical Engineering for Non-Chemical Engineers Training Course

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Chemical Engineering for Non-Chemical Engineers is a 1-week training course for mechanical, electrical and civil engineers, technicians and technical managers working in chemical plants, ending with an annotated process flow diagram of one unit they support. Plants rely on mixed-discipline crews, and decisions on pumps, power, structures and maintenance windows go wrong when the process behind them is unclear. Jupiter Prime Training delivers this course for multidisciplinary plant teams.

Why Chemical Engineering for Non-Chemical Engineers Matters Now

Chemical, petrochemical and fertiliser plants now run lean engineering groups in which other specialists cover work once handled by process engineers. Those specialists approve pump replacements, motor upgrades, foundation repairs and shutdown scopes that change how a unit behaves. Without a working grasp of material balances, pressure drop, heat duty and separation, they miss the process consequence of an equipment decision. Plants with this shared language catch problems in design and change reviews; others find them at startup, when correction costs most.

Who Gains Most from Chemical Engineering for Non-Chemical Engineers

- Mechanical engineers who specify and maintain pumps, compressors, vessels and piping
- Electrical engineers who size drives, motors and power supplies for process equipment
- Civil and structural engineers who support process units, pipe racks and tank foundations
- Technicians who maintain equipment and need to read process documents in the field
- Technical managers who approve projects and shutdown scopes across several disciplines

A multidisciplinary maintenance or projects group gains most when its mechanical, electrical and civil members attend together and learn to read the same process documents.

Chemical Engineering for Non-Chemical Engineers Capabilities

Participants leave able to follow the process logic behind their equipment.

- Calculate a simple material and energy balance around a unit — feed, product and utility checks
- Assess pressure drop and pump duty from line sizes and flow — equipment replacement decisions
- Apply heat transfer basics to exchanger and furnace duty — maintenance and cleaning priorities
- Test how separation columns and reactors respond to feed changes — operating limit discussions

- Build an annotated process flow diagram for a familiar unit — design and change reviews
- Communicate equipment changes in process terms — management of change submissions

Key Chemical Engineering for Non-Chemical Engineers Terms

- Material balance — an account showing that mass entering a unit equals mass leaving plus any accumulation inside it.
- Energy balance — an account of heat and work entering and leaving a unit.
- Process flow diagram — a drawing of major equipment, main streams and operating conditions that shows how a unit works.
- Piping and instrumentation diagram — a detailed drawing of every line, valve, instrument and control loop.
- Unit operation — a basic physical step such as heat exchange, separation or pumping.
- Reactor conversion — the fraction of a feed reactant that is turned into products inside a reactor.

Chemical Engineering for Non-Chemical Engineers Day by Day

Day 1: How a Chemical Plant Works

- Process Industry Value Chains in Chemicals and Fertilisers — Plant Purpose
- Feed, Reaction, Separation and Product Sections — Unit Layout Logic
- Units, Dimensions and Conversions — Reading Process Data Correctly
- Process Flow Diagram Symbols and Stream Tables — Following the Flow
- Interfaces Between Process and Other Disciplines — Shared Decisions

Day 2: Balances and Fluid Flow

- Material Balances Around Mixers, Splitters and Units — Yield Checks
- Energy Balances and Utility Demand — Steam, Cooling Water and Power
- Fluid Properties, Viscosity and Density — Flow Behaviour in Lines
- Pressure Drop in Pipes and Fittings — Line Sizing Consequences
- Pump and Compressor Curves Against System Curves — Operating Point Changes

Day 3: Heat Transfer and Separation

- Conduction, Convection and Radiation Basics — Heat Duty Estimates
- Heat Exchangers, Furnaces and Coolers — Fouling and Capacity Effects
- Vapour-Liquid Equilibrium in Plain Terms — Why Separation Works
- Fractionation Columns, Trays and Packing — Feed Change Responses
- Absorption, Stripping and Filtration Units — Choosing the Separation Step

Day 4: Reactors, Control and Safe Limits

- Reaction Rate, Temperature and Catalysts — Conversion and Selectivity
- Batch and Continuous Reactor Types — Equipment and Hazard Differences
- Control Loops on Process Flow Diagrams — Reading Instrument Tags
- Piping and Instrumentation Diagram Reading — Valves, Reliefs and Interlocks
- Operating Envelopes and Process Hazards — Management of Change Triggers

Day 5: Practising the Annotated Process Flow Diagram

- Unit Selection and Stream Table Completion — Balance Consistency
- Fluid Flow and Pump Review — Bottlenecks and Spare Capacity
- Heat Duty and Separation Notes — Fouling and Feed Sensitivities
- Discipline Interface Questions — Items for Process Engineer Review
- Annotated Process Flow Diagram — Balances, Equipment Limits and Questions

Applying Chemical Engineering for Non-Chemical Engineers After the Course

- Prepare a stream table for one unit you support, close its material balance with plant data and review discrepancies with the unit process engineer.
- Review the next equipment change request in your discipline against the process flow diagram, recording its effect on flow, heat duty or separation before approval.

Chemical Engineering for Non-Chemical Engineers Questions FAQ

What is chemical engineering for non-chemical engineers, and why does it matter now?

Chemical engineering for non-chemical engineers explains balances, fluid flow, heat transfer, separation and reactors in plain engineering terms. It matters now because lean plant teams expect other disciplines to judge the process effects of equipment decisions.

Which roles gain most from chemical engineering for non-chemical engineers training?

Mechanical, electrical and civil engineers, technicians and technical managers in chemical plants gain most. They maintain, power and support process equipment and must talk confidently with process engineers.

How does chemical engineering for non-chemical engineers differ from a process design course?

It builds understanding rather than design capability. Participants read process flow diagrams, close simple balances and judge equipment effects, without sizing columns or simulating whole plants as process designers do.

What do you bring back from chemical engineering for non-chemical engineers training?

You bring back an annotated process flow diagram of a unit you support. It records balances, equipment limits and questions to settle with process engineers.

Chemical Engineering for Non-Chemical Engineers: The Way Forward

The annotated process flow diagram first informs how the next equipment change in a participant's discipline is reviewed. Mechanical, electrical and civil engineers use it with process engineers to agree limits and spare capacity. After its first use in a change review, revisit the stream table behind it, because new plant data will show where the balance assumptions need correcting.