CONCEPT

Engineering for Non-Engineers: Plant Equipment, Power and Structures

24 – 28 January 2027
Dammam - Eastern Province five-star



Engineering for Non-Engineers: Plant Equipment, Power and Structures

Ref: 746_19456 **Date:** 24 – 28 January 2027 **Location:** Dammam - Eastern Province five-star **Fees:** 19500 SAR

Introduction:

Engineering for non-engineers matters because procurement, finance, HR, legal and administration teams in industrial plants, utilities and construction firms approve purchases, budgets, contracts and staffing for equipment they cannot picture, and decisions stall or go wrong when a pump datasheet, a switchgear quotation or a foundation variation is misunderstood. This Core Concept course explains rotating machines, valves and piping, electrical power and building structures in plain language, together with units, drawings and maintenance terms. Participants finish with a Technical Briefing Note on a case plant item that supports a non-technical decision.

Course Objectives:

- Use engineering units and vocabulary correctly when reading quotations, reports and site correspondence
- Explain in plain language how pumps, compressors, electric motors, turbines, valves and piping deliver a plant duty
- Describe how electricity moves from generation through transformers and switchgear to the equipment that uses it
- Interpret the title block, views, dimensions and key fields of simple drawings and equipment datasheets
- Relate maintenance strategy, reliability measures and permit-to-work controls to cost, downtime and safety exposure
- Prepare focused questions for engineers and a Technical Briefing Note that supports a non-technical approval

Target Audience:

- Procurement and contracts teams who buy equipment, spare parts and engineering services against technical specifications
- Finance and budgeting teams who review capital requests, maintenance budgets and variation claims
- HR and talent teams who recruit, grade and develop engineering and maintenance staff
- Legal and commercial teams who draft and administer construction, supply and service agreements
- Administration and coordination teams who support site operations, projects and asset records

Course Outline:

Day 1: Engineering Vocabulary, Units and the Industrial Asset Landscape

- SI Units Primer: Pressure in bar and kPa, Power in kW, Flow in m3/h and Temperature
- Engineering Disciplines Map: Mechanical, Electrical, Civil, Instrumentation and Process Roles
- Asset Hierarchy: Site, System, Equipment and Component Tag Numbering
- Asset Life Stages: Feasibility, Design, Construction, Commissioning and Operation
- Plant Glossary Card for Equipment Found in Factories, Utilities and Building Sites

Day 2: How Machines, Power Systems and Structures Work

- Centrifugal and Positive Displacement Pumps: Head, Flow Rate and the Pump Curve
- Compressors, Electric Motors and Turbines: Drivers, Driven Machines and Rated Power
- Gate, Globe, Ball and Check Valves with Pipe Size and Pressure Rating Basics
- Electrical Power Chain: Generation, Transformers, Switchgear and Voltage Levels
- Shallow and Deep Foundations, Reinforced Concrete and Structural Steel Frames

Day 3: Reading Drawings, Datasheets and Technical Documents

- Engineering Drawing Anatomy: ISO 7200 Title Block, Views, Scale and Revision Block
- Dimensions and Tolerances: Nominal Size Versus Permitted Variation
- Single-Line Electrical Diagram and Piping Layout Reading at Overview
- Equipment Datasheet Fields: Duty Point, Materials, Rating and Vendor Data
- Technical Bid Comparison Sheet: Matching Quoted Equipment to the Specification

Day 4: Maintenance, Reliability, Safety and What Goes Wrong

- Maintenance Strategies: Breakdown, Preventive, Condition-Based and Predictive
- Reliability Measures: MTBF, Mean Down Time and Availability Calculation
- Failure Examples: Pump Cavitation, Motor Overheating, Breaker Trips and Concrete Cracking
- Permit-to-Work Cycle: Request, Authorisation, Isolation, Lockout-Tagout and Hand-Back
- Life-Cycle Cost Drivers: Capital Outlay, Spares Holding, Energy Use and Downtime Loss

Day 5: Working with Engineers and the Technical Briefing Note

- Question Bank for Engineers: Duty, Redundancy, Lead Time, Spares and Warranty Terms
- Case Study: Replacing a Cooling Water Pump Set at a Manufacturing Plant
- Case Study: Transformer Upgrade and Foundation Works for a Building Extension
- Technical Briefing Note Drafting: Options, Risks, Costs and Recommendation
- Briefing Note Presentation to a Mock Approval Panel and Peer Challenge

Skills You Will Gain:

- Engineering Unit Literacy
- Rotating Equipment Awareness
- Electrical Distribution Awareness
- Structural Basics Recognition
- Drawing and Datasheet Reading
- Reliability Metric Interpretation
- Permit-to-Work Awareness
- Technical Briefing Preparation

Why Attend This Course:

- Leave with a Technical Briefing Note on a case plant item, ready to adapt for a real approval
- Question quotations, variation claims and budget requests with an understanding of what the equipment actually does
- Hold productive conversations with mechanical, electrical and civil engineers without needing an engineering degree
- Compare how support functions work with technical teams alongside peers from manufacturing, utilities, construction and facilities management

Conclusion:

Support functions make better decisions when they can picture the machine, the cable or the foundation behind a request. The course builds that picture from units and vocabulary, through pumps, compressors, motors, turbines, valves, power distribution and structures, to drawings, datasheets, maintenance, reliability and permit-to-work. The final day turns this into questions engineers can answer and a Technical Briefing Note on a case plant item, ready for the next purchase, budget or contract review.