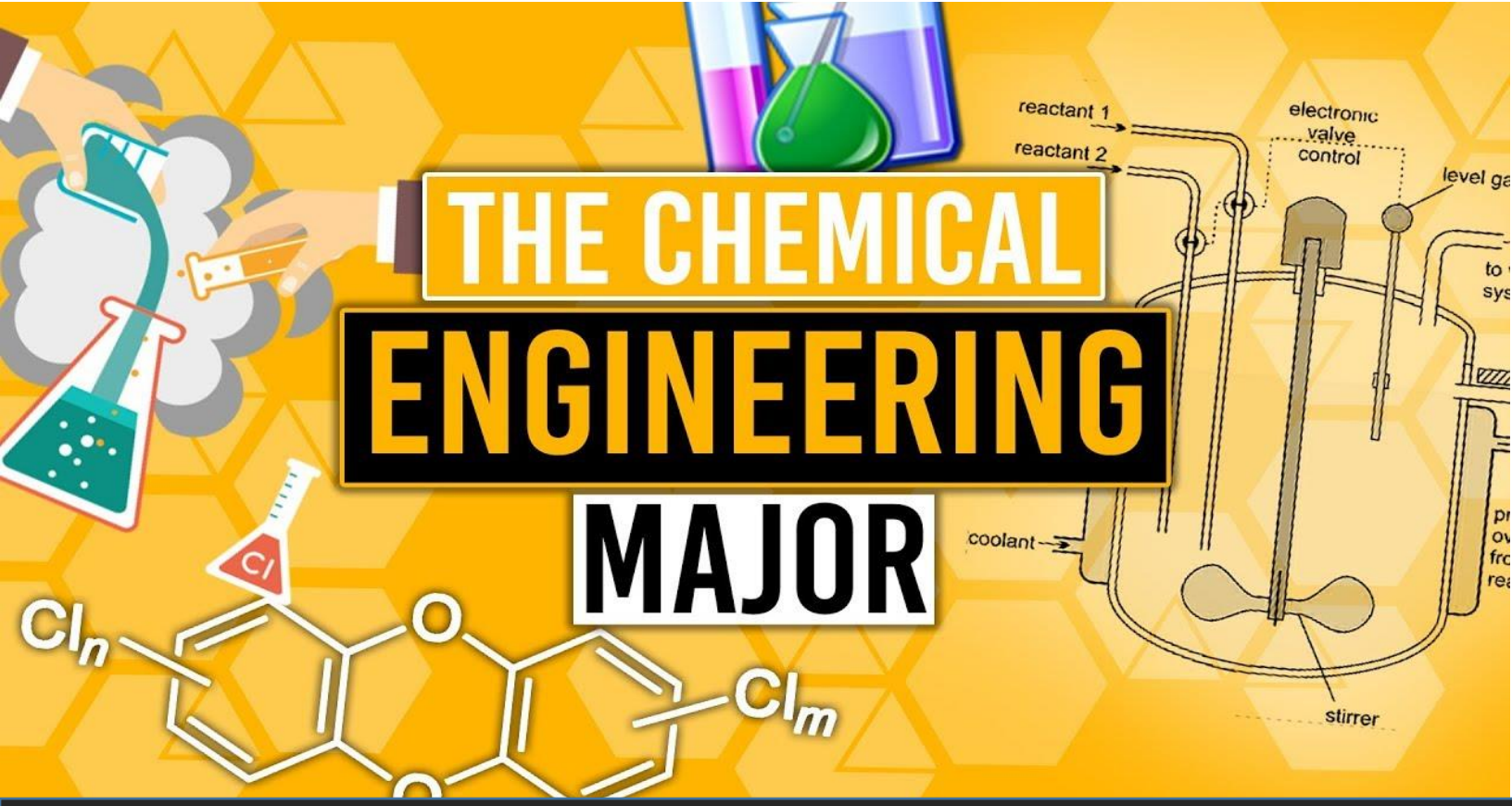

Process Engineering Fundamentals

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BTS
Training & Consultancy

Process Engineering Fundamentals

Introduction:

Process engineering is at the heart of much of the chemical, oil, gas, and petrochemical industries. It requires familiarity with chemical engineering principles, but also with many of the other engineering disciplines including mechanical, electrical and instrumentation. The process engineer is interested in the transportation and transformation of solids, liquids and gases. Of specific importance are separation processes including distillation, heat transfer, hydraulics and fluid flow, reaction engineering, but also process control and economics

Who Should Attend?

Technical and non-technical personnel in the chemical, petrochemical, oil and process industries with a need to understand and discuss fundamental process engineering issues. These will include petroleum engineers, production engineers, trainee process engineers, R&D chemists, plant chemists, plant operators and economists. Case studies and examples will cover a range of levels, making the course also suitable non-technical staff.

Methodology:

This interactive Training will be highly interactive, with opportunities to advance your opinions and ideas and will include;

- Lectures
- Workshop & Work Presentation
- Case Studies and Practical Exercise
- Videos and General Discussions

Certificate:

BTS attendance certificate will be issued to all attendees completing minimum of 80% of the total course duration.

Objectives:

Upon completion of this workshop, the delegates will develop both fundamental and practical understanding of central issues in processes used in oil, gas, petrochemical, chemical, and allied facilities.

This seminar focuses on the central areas of process engineering and guides the delegates in developing both fundamental and practical understandings of key issues. Workshop examples will be drawn from the oil and gas processing, petrochemicals and chemical manufacturing industries.

Contents:

Day 1

Fundamentals and Hydraulics

- Basics
- Process equipment and flow diagrams
- P&IDs
- Mass and energy balances
- Hydraulics and Fluid Flow
- Pressure and head
- Bernoulli's theorem and its field applications
- Flow of liquids
- Reynolds number and pressure drop in pipes
- Two-phase and multi-phase flow
- Pumps and compressors
- Mixing and mixers

Day 2

Heat Transfer and Reaction Engineering

- Heat Transfer
- Thermal conductivity
- Conduction and convection
- Insulation
- Heat transfer coefficients and calculation

- Heat exchangers, type and sizing
- Steam reboilers
- Condensers and sub-cooling
- Introduction to energy recovery
- Catalysts and Reaction Engineering
- Chemical reactions
- Reaction kinetics
- Introduction to catalysis

Day 3

Catalysis and Distillation

- Catalysts and Reaction Engineering (continued)
- Reactor design and operation
- Introduction to catalysis
- Distillation and Other Separation Processes
    - Distillation basics
    - Phase behavior and vapor/liquid equilibria
    - Gas/Liquid separation
    - Trays: function, pressure drop, efficiency, flooding, operations, and damage
    - Bubble and dew points: calculation and application
    - Foam: formation, detection, cause
    - Packed v. trayed columns

Day 4

Separation Processes

- Distillation and Other Separation Processes
- Trays: function, pressure drop, efficiency, flooding, operations, and damage
- Bubble and dew points: calculation and application
- Foam: formation, detection, cause
- Packed v. trayed columns
- Tower capacity: factors, calculation, modification
- Absorption and adsorption
- Solid Liquid separation

Day 5

Process Control and Economics

- Process Control Basics
  - Measured variables
  - Simple feedback control
- Process Economics
  - Preliminary economic analysis
  - Fixed and variable costs, break even
  - Calculating raw materials usage
  - Scale up and six tenths rule