



1) Overview of Industry & role and responsibilities of Process Engineer in various fields.

- Types of Industry.
- Role and Responsibility of process engineer in connectivity with various Dept. works and its own scope of work.

2) Basic Design Requirement selection on the basis of plant type & project handled.

- Design basis selection within Economy.
- Plant type and its productivity.

3) Overview of Basic Engineering package

- Techno-feasibility phase.
- Design phase.
- Construction phase.
- Commissioning phase.
- Operation / Production phase.
- Startup phase.
- Work & connectivity within different phase.

4) Development of PFD & P&ID's

- Parameter consideration while development of PFD and P&ID's.
- Development of P&ID's for various product from actual process requirement.
- Standard Symbols & Abbreviations used in PFD and P&ID development.

5) Standard Code

- Introduction and application of ASME ,API, IS codes

6) Selection of Material & corrosion study

- Types of materials.
- Material selection criteria.
- Types of corrosion.
- Effect of corrosion.

7) Storage Tank & Pressure vessels

- Introduction and types of storage Tank and Process vessel.
- Storage Tank losses.
- Effect of stresses in pressure vessel.
- Selection criteria for purchase of new equipment.
- Different test for checking of storage tank design.
- Design details and calculations.

8) Line sizing

- Line sizing methods.



- Line sizing for single phase flow and two phase flow pattern.
- Standard velocity criteria for line sizing.
- Design details and calculation problems.
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9) Pump selection and pressure drop calculation

- Types of pumps and its importance for application.
- Typical P&ID for pump suction and discharge.
- Criteria for pressure drop calculation.
- Suction and discharge pressure drop calculation.
- Vacuum pump details and calculation.
- Standard pressure drop against piping components.
- Design details and calculation.

10) Control valve and pressure safety valve

- types of control valve.
- Selection of control valve.
- Pressure valve classification.
- Discuss different pressure relief cases.
- Design details and calculation.

11) Mass transfer and Energy balance

- Mass transfer operations.
- Mode of Energy losses.
- Mass balance and Energy balance calculation.

12) Flare System

- Importance of flare system.
- Factors affecting on flare system.
- Design consideration of flare system.

13) Distillation column design

- Types of Distillation.
- Methods for calculation number of Trays.
- Types of plates / Trays.
- Phenomenon of flooding, weeping, Down comer backup, Down comer chocking.
- Packing Capacity of column.
- Details of Vacuum Distillation.
- Designing and calculation.

14) Design of Cooling Tower

- Types of Cooling Tower.
- Sample calculation for Cooling tower designing.



➤ Typical P&ID developed for Cooling Tower.

15) Design of Heat Exchanger

- Classification based on operation, flow pattern, function, application and constructions.
- Explain in Details Shell & Tube heat Exchanger.
- LMTD calculation for different flow pattern.
- Typical Designing example for Double pipe, spiral type, Shell & Tube Heat Exchanger.

16) Introduction of Process Engineering related Discipline

- Introduction of Piping Engineering.
- Introduction of Mechanical Engineering.
- Introduction of Civil Engineering.
- Introduction of Structural Engineering.
- Introduction of Electrical Engineering.

17) Introduction and application of Software

- Introduction of flow Adviser, Unit Converter, Pressure Drop calculation, Hysys, Pipe Design Selection software.
- Introduction of PPP&ID , SP3D Software.