

Chemical Engineering for Non-Chemical Engineers: Course Outline

Day 1

Introductory Lecture and Exercise

- Introductions / needs analysis
- *Group Exercise: Marshmallow Challenge, Video Presentation*

Lecture topics:

- Introduction to Chemical and Process Engineering
- Process design
- Design Deliverables
- Hydraulic Design Calculations

Groupwork with drawings:

- General Arrangement Drawing
- Piping and Instrumentation Diagram
- Functional Design Specification
- Process Design Calculations: Unit Operations, Mass and energy balance
- *Group Mass Balance Exercise: Dairy*
- *Group Process Design Exercise*

Day 2

Recap

Lecture Topics:

- Process Safety (including electrostatic ignition hazards)
- HAZOP
- Programming
- Capital and Running Cost Estimation
- The Threads of Process Design

Groupwork:

- *Group Troubleshooting Exercise 1: Waste Treatment*
- *HAZOP Exercise*
- *Group Pricing Exercise*

Day 3

Recap

Lecture Topics:

- Loss Prevention
- Process/Plant Design
- Process Control and Stats
- Accountancy/Costing
- Materials Selection
- Reactors
- Separators
- Mass and Energy Transfer Balance/Thermodynamics

Groupwork:

- *Troubleshooting Exercise 2: Paper and Pulp*
- *Hydraulic design exercise*

Complete course wrap up

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