

# AMCH20 PROCESS ENGINEERING

## UNIT-1 PRELIMINARY PROCESS SELECTION

- 1.1 Economic Evaluation
- 1.2 Environmental Footprint
- 1.3 Safety Analysis & Controllability, Flexibility

## UNIT-2 SELECTION OF PROCESS STEPS

- 2.1 Identification of Individual process steps.
- 2.2 Grouping into reactor, Separator
- 2.3 Reactor and Recycle modules
- 2.4 Interconnection modules

## UNIT-3 FLOW SHEET SYNTHESIS

- 3.1 Development of alternative routes.
- 3.2 Selection criterion for modules.
- 3.3 Selection of reactor modules, Selection of separation modules.
- 3.4 Determination of flow sheet based on heuristics

## UNIT-4 CONTROL STRATEGY FOR PROCESS

## UNIT-5 SAFETY INSTRUMENTATION AND MULTIPLE REDUNDANCY SYSTEMS

## UNIT-6 MASS AND ENERGY BALANCES

- 6.1 Physico-chemical specification of each stream,
- 6.2 Detailed Mass and Energy balance around major equipment

## UNIT-7 SIZING AND COSTING OF MAJOR EQUIPMENT

- 7.1 Reactors, Heat Exchangers
- 7.2 Multiple effect evaporators
- 7.3 Distillation equipment
- 7.4 Gas – liquid and Liquid contacting equipment , Crystallizers
- 7.5 Drying equipment
8. Filtration equipment, Selection and sizing of pumps and compressors

## UNIT-8 UTILITY SELECTION

- 8.1 Process requirement and Selection of utility such as refrigerant
- 8.2 Chilled water, Cooling water, Steam, Hot oil
- 8.3 Dowtherm Boilers
- 8.4 Molten salt baths
8. Flue gases

### Reference books:

1. Introduction to Process Engineering and Design Kindle Edition by Shuchen B Thakore (Author), Bharat I Bhatt (Author)
2. Chemical Process Equipment: Selection and Design Book by James R. Couper