ChEN 4353 Process Design I - Course Schedule Overview

**Week 1-22 August**
Chapt 1 (p.1 -25), Chapt 2, Chapt 3  Product Design- ARTICLES on Product Design
   - Introduction to course – Product and Process Design
   - Product Design-1 Overview
   - Product Design-2 Property Estimation

**Week 2-29 August**
Chapters 16 and 17
   - Product Design-3 Innovation Maps
   - Product Design-4 Six Sigma in Product Design
   - Product Design-5 Engineering Ethics

**Week 3–5 September (Holiday Monday, Ring Away Wednesday-Friday)**
Chapt 1 (p25-31) Chapter 4 Process Creation-
   - Ethics in Chemical Engineering
   - Process Safety
   - Process Design Overview
   - Process Creation

**Week 4–12 September**
Chapt 4&5&6 Aspen for Process Creation–
   - Use of Aspen for Process Creation-1
   - Use of Aspen for Process Creation-2
   - Heuristics for Process Simulation

**Week 5 – 19 September (Celanese in Class Monday)**
Chapt 4&5 Aspen Tutorials and Problems Solved in Class (Reserve the ICC) -

**Week 6 - 26 September (Away Wednesday and Friday)**
Chapt 5&6 ProMax Tutorials and Problems Solved in Class (Reserve the ICC) -

**Week 7–3 October**
Chapter 22-22 (p543-597) &23 Profitability Analyses -
   - Annual Costs
   - Earnings
   - Profitability Analysis
   - Equipment Sizing for Capital Cost Estimates – Pressure Vessel, etc.
   - Capital Cost Estimates
   - Cost Accounting

**Week 8- 10 October FALL BREAK**

**Week 9-17 October (AIChE Meeting, Ring Away)**
Review for Mid Term Exam -
   - *Mid Term Exam, Wednesday 19 October*
   - Capital Cost Estimates

**Single Unit Design Examples with short Design Reports Each Week**

**Week 10-24 October**
Chapt 18 Heat Exchange-
   - Heat Exchanger Design
Heat Exchanger Optimization
   Heat Transfer Coefficients
   Pressure Drop and Pumping Cost

**Week 11-31 September**
Chapter 19 Separations-
   Separation Tower Design
   Separation Tower Optimization
      Tower Diameter
      Pressure Drop

**Week 12-7 November**
Chapter 20 – Pumps and Compressors
   Pump Design – When to use different designs
   Compressor Design – When to use different designs
   Two stage compressors and their design

**Week 13-14 November**
Chapt 7 Reactors -
   Reactor Design - Pressure Vessel Sizing and Cost
   Gas Phase Reactor - Ethylene Reactor
   Catalytic Fixed Bed Reactor Design
   Fluid Bed Reactor Design

**Week 14-21 November (Holiday Thursday & Friday)**
Chapt 7 Reactors -
   Reactor Design - Pressure Vessel Sizing and Cost
   Gas Phase Reactor - Ethylene Reactor
   Catalytic Fixed Bed Reactor Design
   Fluid Bed Reactor Design

**Week 15-28 November**
Articles on Process Trouble Shooting –
   Mini Plant Software
   K-T Strategy

**Week 16-5 December**
Article on 6Sigma –
   Design of Experiments/Response Surface Mapping
   Use of 6Sigma in Unit/Process Optimization
Chapter 7 (Articles on Reactive Distillation) - Reactive Distillation Example Methyl Acetate
   Course Review

**Finals Week 12 -16 December**
   Final Exam