

ChE 426 – PROCESS DESIGN II

Type (check one): Required: X Elective:

2005-2006 Catalog Data: ChE 426. Process Design II. Application of principles of process and plant design utilizing knowledge from earlier course material to solve comprehensive industrial problems. Includes flowsheet development, equipment sizing and determination of operating parameters, startup and safety considerations, cost estimation and economic analysis. Prerequisites: ChE 425 and ChE 443. Offered in the Spring semester. *One semester; three credits.*

Prerequisites: ChE 425

Co-Requisites: None

Textbook: *Analysis, Synthesis, and Design of Chemical Processes*
Turton, Bailie, Whiting and Shaeiwitz, Prentice Hall, 1998.

Other Required Materials: None

Other References: *Process Design Principles*, Seider, Seader and Lewin, Wiley & Sons, 1999.

Instructor: Dr. Ali Pourhashemi, Assistant Professor

Course Objectives:

1. This course is intended to help students to assimilate the content of the entire chemical engineering curriculum in attacking of typical open-ended design problem and be comfortable utilizing a computer simulator (ASPEN PLUS) to achieve the purpose. It should instill in students confidence that they can accomplish productive and practical process design work.
2. Encourage students to communicate through class discussion.

Prerequisites by Topics: Fluid, Heat & Mass Transfer, Reaction Kinetics, Math

Topics: (Chapters 14 - 22):

1. Reactor Performance
2. Regulating Process Conditions
3. Process Troubleshooting
4. Alternative Techniques and Guidelines for Synthesis & Process Optimization
5. Using a Simulator for the Synthesis of a Process
6. Studying Codes of Ethics and Professionalism
7. Learning the Aspects of the Risk Assessments
8. Learning the Guidelines for Written and Oral Communications

Class Schedule: Three 50-minute classes per week

Prepared by: Ali Pourhashemi, Ph.D. **Date:** September 2005

**Professional Component:
ChE 426 – PROCESS DESIGN II**

| | |
|---|--|
| Category (check one) | <input type="checkbox"/> Math/Basic Science <input checked="" type="checkbox"/> Engineering <input type="checkbox"/> General Education <input type="checkbox"/> Other |
| Design (check one) | <input checked="" type="checkbox"/> Significant <input type="checkbox"/> Some <input type="checkbox"/> None |
| Realistic Constraints (check all that apply) | <input checked="" type="checkbox"/> Economic <input checked="" type="checkbox"/> Environmental <input type="checkbox"/> Sustainability <input checked="" type="checkbox"/> Manufacturability <input checked="" type="checkbox"/> Ethical <input checked="" type="checkbox"/> Health & Safety <input type="checkbox"/> Social <input type="checkbox"/> Political |

Relationship to Program Outcomes:

Check all that apply:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs
- (d) an ability to function on multi-disciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global and societal context
- (i) a recognition of the need for and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice