ECH 4604

Chemical Engineering Process Design I

Fall 2006

Course Instructor

Name	Title	Office	Phone	Email
Dr. Srinivas Palanki	Professor	164	410-6163	palanki@eng.fsu.edu

Office Hours

The "official" office hours are from 10:45 a.m. to 12:45 p.m. on tuesdays and thursdays. However you may knock on my door at *any time* and if I am in, I will see you. Alternatively, you can email me and *schedule* an appointment.

Text:

1. Analysis, Synthesis and Design of Chemical Processes, 2nd Ed., R. Turton, R. C. Bailie, W. B. Whiting, and J. A. Shaeiwitz, Prentice Hall PTR, Upper Saddle River, New Jersey 07458, 2003.
   ISBN: 0-13-064792-6

Special Software:

Please contact Dr. Palanki to get a copy of CHEMCAD.

Course Description:

This is the first course of a two-semester sequence on analysis, synthesis, and design of chemical processes. This sequence prepares students for engineering practice. Students will integrate knowledge from prior courses with process economics, computer-aided design, engineering standards, and realistic constraints to solve open-ended process problems.

Course Material:

- Part I: Development of Process Flowsheets
- Part II: Analysis of Process Flowsheets
- Part III: Equipment Sizing and Costing
- Part IV: Optimization

Course Learning Objectives

1. Students will apply engineering principles to design chemical processes.
2. Students will analyze the feasibility of unit operations based on thermodynamics, transport, and reaction engineering principles.

3. Students will synthesize a chemical process from its component parts.
4. Students will apply modern simulation software to solve unit operations and flowsheet design problems.
5. Students will apply optimization principles to compute the optimal operating points for chemical processes.

Prerequisites:

Students are urged to understand the prerequisite requirements for all courses in the curriculum and to incorporate these requirements into their undergraduate planning. Below is pertinent information for the courses in the process design sequence.

- **Prerequisites for ECH 4604**

ECH 3274L	Measurements & Transport Phenomena Laboratory
ECH 3418	Separations Processes
ECH 4267	Advanced Transport Phenomena
ECO 2023	Principles of Microeconomics
ECH 4504	Kinetics & Reactor Design *(Corequisite)*

  Students not meeting these prerequisites must drop the course. The department will drop students who do not do so voluntarily and the department assumes no responsibility for any drop fees assessed by the universities.

- **Courses for which ECH 4604 is a Prerequisite**

  ECH 4604 is a key course in the undergraduate curriculum. It is a prerequisite for the following core chemical engineering courses that are taught at the FAMU-FSU College of Engineering only during the spring semester:

  – ECH 4323 Process Control
  – ECH 4323L Process Control Laboratory
  – ECH 4615 Chemical Engineering Process Design II

  Students failing ECH 4604 will likely set back their progress towards graduation by one year.

Grading Weight:

Midterm I	25 points
Midterm II	25 points
Design Project:	40 points
CHEMCAD Assignments and Quizzes	8 points
Final	2 points

Attendance, Computer Use, and Bonus Points Policy:

- Students are expected to attend *all* lectures.
- Students may bring their laptops in class for running CHEMCAD simulations and for accessing course material (lectures, assignments, project). Any other use (e.g. surfing the web, checking email) will result in a **one point** deduction for each occurrence.
- Bonus points may be given for class participation and for exceptional work.

Grading Scale

85-100	A
70-84	B
50-69	C
40-49	D
less than 40	F

This fixed scale will be used. There will be no "grading on the curve".

CHEMCAD Assignments and Design Project:

- Students will work in teams of 3 for selected assignments, and the design project.
- Students will select their team partners by the start of the second day of class. Students are not allowed to change teams or split up after the second day of class.
- For team assignments, only one copy of the assignment per team needs to be submitted.
- Please use only one side of a page and staple all pages together before class. Do not use ripped-out sheets from a spiral notebook. All graphs must be computer generated.

Midterm Exams and Design Project Schedule

October 10, 2006	Midterm I
November 7, 2006	Project due
November 22, 2006	Midterm II
December 12, 2006	Final

The design project will be graded on (a) substantial correctness of results and soundness of conclusions, (b) ingenuity and logic employed, (c) accuracy of computations, and (d) form of presentation. The use of CHEMCAD software is necessary. The use of textbooks, handbooks, journal articles, and lecture notes is permitted. However, students are not allowed to discuss the problem and potential solutions outside their team. The design project should be treated as a final examination.

Make-up Exam policy

- There will be a make-up exam for students who missed the midterms for a **LEGITIMATE** reason. Since students taking the make-up exam will have more time to prepare, the make-up exam will be **SIGNIFICANTLY MORE DIFFICULT** than the mid-term exams. Students who wish to take the make-up exam have to submit a written reason and provide supporting documents to the instructors for missing the mid-term exam. Missing the mid-term because of a job interview is **NOT** a legitimate excuse.

- The final for this course will be a "take-home" exam based on CHEMCAD.

Honor Code: Please review the honor code in the student handbook of your university.

Americans with Disabilities Act:
Students with disabilities needing academic accommodation should: (1) register with and provide documentation to the Student Disability Resource Center; (2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class.

Syllabus Change Policy: This syllabus is a guide for the course and is subject to change with advance notice.

This syllabus and other class materials are available in alternative format upon request.