University of Alabama  
Department of Chemical and Biological Engineering  

CHE 481-001: Chemical Process Design I  
Fall 2010  

Instructor: Dr. Stephen Ritchie  
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Office Hours:  
MW 2:00 PM – 3:30 PM  
or by appointment  


Time and Place: TR  2:00 – 5:00 PM, 316 HM Comer  

Additional Materials:  
The following materials may aid you in understanding the material in this course:  

Course Prerequisite:  
CHE 255 (Chemical Engineering Thermodynamics)  

Course Description:  
Technical and economic design of chemical processes and plants.  

Topics:  
1. Teamwork  
2. Diagrams for understanding chemical processes  
3. Understanding process conditions  
4. Estimation of capital cost  
5. Estimation of manufacturing costs  
6. Engineering economic analysis  
7. Profitability analysis  
8. Simulators for design of chemical processes  

Expected Outcomes:  
Students will have the ability to explain/design/analyze:  
1. teams and teamwork,  
2. process flow diagrams,  
3. capital costs,  
4. costs of utilities and manufacturing,  
5. discounted cash flow,  
6. equivalent annual operating cost,
7. net present value (large projects),
8. incremental net present value, and
9. process simulation.

Important Dates (regular exam dates subject to change):
August 19   First class session
September 21  Exam I
September 22   General Career Fair (10-3)
September 23   Engineering Career Fair (10-3), we will have class at 3 PM
October 26   Exam II
November 8-12  AIChE Annual Meeting
November 18   No class – Fall Break
December 9   Final Exam (Optional based on course performance)

Lectures and Reading:
Reading assignments will parallel the notes. Notes will be made available electronically via the course website (http://www.bama.ua.edu/~sritchie/teaching.html). It is strongly encouraged that you review these before the lecture as they will greatly enhance your grasp of the material and make the lectures much more useful. Please note that lectures are for clarification of the course material, and that tests may contain material from the reading that has not been explicitly covered in the lecture.

ChemCAD:
There will be regular ChemCAD assignments during the semester. These will be given in class, and will be due at the subsequent class period. One ChemCAD score may be dropped.

Homework Assignments:
Homework will be assigned regularly and will be due at the beginning of class. **No late homework will be accepted.** Homework assignments must be completed in teams. All team members should contribute to completion of the assignments. The use of spreadsheets and simulation software is encouraged where appropriate. Sample calculations should be included when not apparent from the output. Two homework scores may be dropped.

Design Projects:
You will be required to complete two design projects based on ChemCAD. These will be accompanied by a report and hand calculations. More information will be dispensed during the semester.

Equipment Presentations:
All teams will be required to present a review of a particular type of chemical engineering equipment during the course of the semester. The presentation should be 15 minutes long, and will be given at the end of a class period. More details will be given out during the semester.
Extra Credit:
Bonus points will be given for participating in professional development activities during the semester. This includes activities related to AIChE, SWE, ESWB, and other engineering organizations. You may earn points up to 5% of the course grade (up to 10 activities).

Grading:
At worst a straight grading scale will be used in this course.

Grade Composition:
- ChemCAD: 10%
- Homework: 15%
- Design Projects: 25%
- Equipment Presentations: 5%
- Exams (2): 30%
- Final Exam: 15%

Academic Integrity:
All students in attendance at the University of Alabama are expected to be honorable and observe standards of conduct appropriate to a community of scholars. The University of Alabama expects from its students a higher standard of conduct than the minimum required to avoid discipline. I expect everyone to abide by the Academic Honor Pledge. Violators will be dealt with in the strictest possible manner in accordance with University policy.