

CHEMICAL PROCESS SIMULATION AND DESIGN

ChEE 4540, Fall 2015, PL 3070

MWF 11:00-11:50

Aim

The objective of this class is to develop students' ability to analyze and design chemical processes. Specifically, students should be able to: 1) translate verbal or written specifications into process flow sheets, 2) use ChemCAD or Visio to draw and simulate process flow sheets, 3) design processes to accomplish specific tasks, 4) determine process economics, 5) troubleshoot/debottleneck /optimize processes, 6) understand ethical issues related to process design, 7) prepare technical reports, 8) give oral presentations, 9) use technology to assist the preparation and presentation of technical reports.

Upon completion of this class, the student will have demonstrated: 1) the ability to identify, formulate, and solve engineering problems; 2) the ability to apply knowledge of mathematics, science, and engineering to solve engineering problems; 3) the ability to understand, analyze, and design chemical processes, 4) proficiency in the use of computers and software; 5) the ability to communicate their work to technical and non-technical audiences through written reports and oral presentations; 6) the ability to learn and think independently and to function well in a team environment; 7) an awareness of the importance of safety practices; 8) knowledge of contemporary issues including the environmental, societal, and global consequences of their work; 9) knowledge of an engineer's professional and ethical responsibilities.

Textbook

Turton, R., R.C. Bailie, W.B. Whiting, and J.A. Schaeiwitz, Analysis, Synthesis, and Design of Chemical Processes, 3rd edition, Prentice Hall, Upper Saddle River, NJ (2012).

Instructor

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Office Hours

I don't have an allotted day/time for office hours. You are welcome to stop by my office at any time and if I'm available we can meet or set up a meeting time via email.

Grading

Homework and quizzes	30%
Mini design project	20%
Written Capstone Design Report	35%
Oral Capstone Design Report	15%

Tentative Schedule

Week	Topics	Reading
8-24 & 8-31	Introduction to Engineering Heuristics	11
9-7	Process optimization	14
9-14	Pinch Technology	15
9-21	Short design project, Individual Process Unit Performance	18
9-28	Performance of Multiple Units; Midterm Exam	19
10-5	Reactor Performance and Safety (Runaway Reactions); Process Troubleshooting	20, 22
10-12 until 12-03	Process Design Problem (grp. mtgs, MWF)	