Course Pre/Co-Requisites:
CHE 255 (Chemical Engineering Thermodynamics) – Prerequisite

Course Description:
Separation processes are ubiquitous in the chemical processing industry. In general, the cost of separation may be 40-70% of the capital and operating cost of a plant. Hence, a good understanding of separations is crucial for the practicing chemical engineer. This course will provide a unified approach to the basic calculations and fundamental concepts involved in the design of equilibrium-stage separations processes and continuous contacting equipment. Computer proficiency is required for a passing grade in this course.

Topics:
1. Thermodynamics and Separations
2. Single Stage Separations
3. Binary Distillation
4. Basics of Mass Transfer
5. Absorption and Stripping
6. Extraction
7. Adsorption

Expected Outcomes:
Students will have the ability to explain/design/analyze:
1. how thermodynamics is used to obtain parameters necessary for the design of separation unit operations,
2. single stage equilibrium separators,
3. distillation columns for the separation of binary mixtures,
4. basic equations for mass transfer,
5. driving forces for mass transfer,
6. solvent and surface area driven separations.

Important Dates (regular exam dates subject to change):
- January 7: First class session
- January 19: Martin Luther King, Jr. Holiday (no class)
- February 11: Exam I
- March 14 – March 22: Spring Break
- March 25: Exam II
- April 28: Final Exam (11:30 AM – 2 PM)

Lectures and Reading:
Reading assignments will parallel the notes. Notes for each chapter are available on the course website. It is strongly encouraged that you read 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 quizzes and tests may contain material from the reading that has not been explicitly covered in the lecture.

Quizzes:
There will be announced quizzes during the semester. These will be short (~ 10 minutes) and will be held at the end of the class period. One quiz score may be dropped.

Homework Assignments:
Homework will be assigned approximately once a week and will be due at the beginning of class. **No late homework will be accepted.** Homework assignments should be completed independently. The use of spreadsheets and simulation software is encouraged where appropriate. Sample calculations should be included when not apparent from the output. One homework score may be dropped.

Design Project:
You will be required to design a separation process on ChemCAD. This will be accompanied by a report and hand calculations. More information will be dispensed during the semester.
**Attendance and Make-up Policy:**
On-time and regular attendance is expected. There are a number of in-class exercises, quizzes, and exams during the semester besides normal interactions during lecture that make attendance important. I recognize that you are adults, however, and you are free to choose not to attend. This decision has consequences, and there are no make-up opportunities for missed quizzes or exams. One homework score and one quiz score may be dropped during the semester.

**Grading:**
At worst a straight grading scale will be used in this course. The grade of A+ will only be assigned for 100% or greater. There will be one extra credit assignment during the course.

**Grade Composition:**

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tr>
<td>Homework</td>
<td>15%</td>
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<td>Design Project</td>
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<td>Quizzes</td>
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<td>Exams (2)</td>
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<td>Final Exam</td>
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**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. Academic misconduct includes all acts of dishonesty in any academically related matter and any knowing or intentional help or attempt to help, or conspiracy to help, another student.

The Academic Misconduct Disciplinary Policy will be followed in the event of academic misconduct.

**Disability Accommodation:**
Students with disabilities are encouraged to register with the Office of Disability Services, 348-4285. Thereafter, you are invited to schedule appointments to see me during my office hours to discuss accommodations and other special needs.