ChE 421 - Separation Processes

Code and Name: ChE 421 - Separation Processes
Credit Hours: 3 (Lecture: 3, Tutorial: 1)

Textbook:
- Transport Processes and Separation Process Principles, C.J. Geankoplis, 4th Edition, **John Wiley & Sons Inc, 2009**
Other References:
- Principles and Modern Application of Mass Transfer Operations, Jaime Benitez, 2nd ed., 2009
- Coulson's & Richardson's Chemical Engineering, Vol.2, 5th ed., 2002.
- Separation Process Engineering, Philip C. Wankat, 2nd ed, 2007
- Separation Process Principles, 3rd Ed. J.D. Seader, E.J. Henley, D.K. Roper, New York: Wiley, 2011

Course Description:
Equilibrium stage approach to absorption/stripping, distillation, solvent extraction. Graphical methods are introduced as well as the concepts of minimum number of stages, minimum solvent or stripping agent rate and minimum reflux ratio. The concept of humidity and the use of psychometric charts are introduced. Membrane

Pre-requisites: ChE326 Mass Transfer
Co-requisites: None

Course Learning Outcomes:
With relation to ABET Student Outcomes (SOs: 1-7)

1. Create equilibrium diagram/plot based on given equilibrium data for various separation processes (6)
2. Design the separation process equipment (2)
3. Solve engineering problems related to separation processes (1)
4. Research using electronic source, internet, and all accessible information required for solving engineering problem (7)
5. Show effective communication (3)
6. Operate several chemical engineering software such as ASPEN, CHEMCAD, to solve separation process equipment design.(not applicable in this semester) (6)
7. Demonstrate constructive work in a group (5)

Topics to be covered:

- Distillation
- Adsorption
- Liquid-Liquid Extraction
- Liquid-Solid Leaching
- Membrane

Grading Policy:
The grading for the course are 60% coursework and 40% Final Exam. The course work consists of two Midterm Exams, where each midterm exam is worth 20%. It also includes quizzes, homework, and projects for the remaining 20% that is modified by the course instructor.