



ChE 213 - Principles of Chemical Engineering II

Code and Name: ChE 213 - Principles of Chemical Engineering II

Credit Hours: 2 (Lecture: 2, Tutorial: 1)

Textbook:

- Elementary Principles of Chemical Processes, Richard M. Felder & Ronald W. Rousseau, 3rd Edition, John Wiley & Sons, 2005

Other References:

- None

Course Description:

The energy balance for chemical processes using first law of thermodynamics. Energy and energy balances, steady state energy balances on reactive and nonreactive processes, computer-aided balance calculations.

Pre-requisites: ChE 211 Principles of Chemical Engineering I, MATH 106 Calculus II

Co-requisites: None

Course Learning Outcomes:

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

1. Recognize the higher heating value and the lower heating value (1)
2. Define open system and adiabatic process (1)
3. Identify any nonreactive process (1)
4. Explain the dry-bulb temperature, wet-bulb temperature of air and to use the psychometric chart (1)
5. Calculate standard enthalpy of reaction from standard heat of formation (1)
6. Perform an energy balance on a chemical reactor using the heat of reaction method. (1)

Topics to be covered:

- Forms of energy
- Energy balances on closed systems and on open systems
- Tables of thermodynamics data, energy balance procedure
- Balances on nonreactive processes & Elements of Energy balance calculations
- Balances on reactive processes & Heat of reaction
- Measurement and calculation of heat of reaction: Hess's law, Formation reactions and heat of Formation & Heats of combustion.
- Energy balances on reactive processes & fuels and combustion.
- Computer-Aided balance calculation

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.

