

Chemical Engineering Department

ChE 202: Chemical Engineering Principles 2

Catalog Data: (2 credit hours- 3 contact hours)

(Study of the law of conservation of energy and energy balance concepts. Systematic approaches for the solution of energy balances on flowsheets of chemical processes).

Prerequisite: ChE 201

Textbook:

R. M. Felder and R. W. Rousseau, *Elementary Principles of Chemical Processes*, John Wiley & Sons, Inc., USA.

References:

1. G. V. Reklaitis, *Introduction to Material and Energy Balances*, John Wiley & Sons, USA.
2. D. M. Himmelblau, *Basic Principles and Calculations in Chemical Engineering*, Prentice-Hall Englewood Cliffs, USA.

Goal:

This course is a continuation to ChE 201. The course introduces the student to the basic principles of energy balance for nonreacting and reacting systems in chemical engineering.

Topic to be covered:

1. Energy and energy balance (8 class)
(Forms of energy, the first law of thermodynamics, energy balances on closed systems, energy balance on opens systems, table of thermodynamic data, energy balance procedures, mechanical energy balances).
2. Balances on nonreactive processes (13 class)
(Elements of energy balance calculations, changes in pressure at constant temperature, changes in temperature, phase change operations, mixing and solution).
3. Balances on reactive processes (9 class)
(Heats of reaction, Hess's law, formation reactions and heats of formation, heats of combustion, energy balances on reactive processes, fuels and combustion).

Class requirements:

1. Homework assignments.
2. Two in class tests.
3. Final exam.

Computer usage: none

Laboratory projects: none

Assessment of course goals:

Through homework and exam grades (Homework 10%, Tests 40% and Final Exam 50%)

Contribution to course goals:

Engineering Science $1\frac{1}{2}$ credits

Engineering Design $\frac{1}{2}$ credits

Mathematics or Basic Science _____ credits

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