

CHE 113 Chemical Process Analysis

COURSE GOALS AND OBJECTIVES

Current course description

Formulation and solution of chemical engineering problems involving physical and chemical changes and accompanying energy. Stoichiometric and compositional relationships, materials and energy balances, materials properties, chemical processing systems.

Current syllabus topics

- Basic Principle: The simplest chemical process, with flow streams in and out plus accumulation. Concepts of equilibrium, steady-state and unsteady-state; batch and continuous.
- Conversion of Mass: Overall balances, species balance, rates of accumulation and recycle streams.
- Limitations on our ability to produce streams of a specific composition: Thermodynamic: ex. simple distillation. Kinetic: ex. well-mixed reactor. Physical: ex. entrainment of a solution in filter cake. Concept of using multiple stages.
- Energy Balance: Conservation of energy for closed systems. Work terms: body forced versus surface forces. Friction: interconversion of mechanical to thermal energy. Thermal energy equation. Mechanical energy equation. Resistance to fluid flow, friction factors, pipe network and power generation problems.

Course goals and outcomes

- To teach students how to formulate and solve a wide variety of problems associated with the design of chemical processes.
- To help students recognize the relationships between their basic science education and the solution of chemical engineering problems
- To provide students with perspective on the role of chemical engineers in industry and society. Outcomes assessed by the evaluation of problems sets and exams.

Required/Elective: Required

Textbook: "Elementary Principles of Chemical Process", 3rd Edition. By Richard M. Flender, John Wiley & Sons, New York 2000

Pre-requisites: CHM 103 or 105, MTH 143 or 162

Class schedule: as per bulletin