



Particle Technology

CBE 5715

Credit Hours:

3.00 - 3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Engineering processes involving particulates and powders. Multiphase transport phenomena and fluidization are emphasized.

Prerequisites and Co-requisites:

Prereq: 2523 (523), and Math 2177 or Math 415.01; or Grad standing; or permission of instructor.

Course Goals / Objectives:

- Be exposed to the basic principles and fundamental phenomena associated with gas-solid flows
 - Be exposed to characteristics of selected gas-solid flows
 - Master the collisional mechanics of solids, based primarily on elastic deformation theories
 - Master the momentum and charge transfer of gas-solid flows
 - Be exposed to various gas-solid separation processes
 - Master the fundamentals of fluidization
 - Be exposed to the granular flow theory, nucleation, and three-phase fluidization by guest lecturers
 - Understand the role of particle technology in chemical process systems
 - Learn how to apply particle technology principles to industrial applications
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Course Topics:

- Part I Basic relationships Chapter 1. Size and properties of particles Chapter 2. Collision mechanics of solids Chapter 3. Momentum transfer and charge transfer
 - Chapter 5. Basic Equations Chapter 6. Intrinsic Phenomena in a Gas-Solid Flow Midterm Exam
 - Part II System Characteristics Chapter 7. Gas-Solid Separation Chapter 9. Dense-Phase Fluidized Beds
 - Chapter 9. Dense-Phase Fluidized Beds (continued) Chapter 10. Circulating Fluidized Beds Chapter 11. Pneumatic Conveying of Solids
 - Particulate Reaction Engineering in energy and environmental systems, applications of chemical looping technology
 - Review for final exam Final Exam
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Designation:

Elective