CH203 Aug 3:0

Transport Processes

Instructor

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Department: Chemical Engineering

Course Time: Tue., Thu., 8:30-10 AM

Lecture venue: Chemical Engineering Lecture Hall

Detailed Course Page: http://chemeng.iisc.ac.in/chemeweb/courses.htm

Announcements

Brief description of the course

Transport Phenomena course for graduate students who have studied applied mathematics, fluid mechanics

and transport phenomena at the undergraduate level. Covers heat/mass transfer and momentum transfer.

Prerequisites

Applied mathematics, fluid mechanics and transport phenomena at the undergraduate level.

Syllabus

Basic transport laws and transport properties; shell and differential balances; Navier-Stokes equations,

equations of change for temperature and concentration in dilute systems; similarity of three transport

processes; steady and unsteady transport, forced and natural convection; convective diffusion in dilute

solutions; integral balances and connection to unit operations; boundary layer theory, turbulence.

Course outcomes

Students should have a comprehensive understanding of how a balance between convection and diffusion in

heat/mass and momentum transfer at the microscopic level gives rise to the transport rates at the macroscopic

scale, and how these can be calculated using solution procedures such as similarity transforms, separation of

variables and boundary layer theory.

Grading policy

50% final exam, 30% for two mid terms, 20% for assignment.

Assignments

Resources