UNIVERSITY OF ARIZONA
DEPARTMENT OF CHEMICAL AND ENVIRONMENTAL ENGINEERING
CHEE 487/587 TOPICS IN TRANSPORT PHENOMENA
SPRING 2017

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Office hours: open-door policy

Description

This course deals with applications of transport phenomena beyond those that are covered in basic courses.

Tentative Program

Part 1 – Introduction to Rheology

1.1 Introduction
Behavior of materials subjected to external forces. Complex fluids: examples of non-Newtonian behavior. Mass and momentum conservation. Equations of motion. Stress and constitutive equations.

1.2 Non-Newtonian Viscous Flows
The generalized Newtonian fluid. Models of non-Newtonian viscosity. Normal stresses. Shear and elongational flows. Solution of the equations of motion for simple flows with negligible viscoelasticity.

1.3 Viscoelasticity
Linear viscoelasticity. Characterization of viscoelastic response. Nonlinear viscoelasticity.

Part 2 – Modeling of Transport Processes

2.1 Applications involving chemical reactor analysis, including processes in which transport phenomena is important.

2.2 Simulation of membrane transport.

Textbook

Class Notes and reference materials, to be posted on the course web site.

Course Evaluation

The course evaluation will consist of regular homework assignments.