Intermediate Transport Phenomena

Catalog Description

Pre-requisites
- Admission to the NMSU Ch E graduate program or instructors’ permission.

Textbook
- Transport Phenomena, Revised 2nd Edition
  Authors: R. Byron Bird, Warren E. Stewart, Edwin N. Lightfoot
  Publisher: John Wiley & Sons, INC., 2007.

Course Objectives
At the end of this course, students:
- understand and be able to do vector and tensor analysis;
- can write and develop momentum, heat, and mass transport equations;
- are able to analyze and solve macroscopic momentum, heat, and mass balances for steady and quasi-steady-state problems;
- understand the boundary layer and the difference in transport phenomena between laminar and turbulent flows;
- become familiar with polymeric and non-Newtonian fluids; and
- know the analogies between momentum, heat and mass transfer problems.

Topics Covered
- Vector and tensor analysis (Appendix A)
- Viscosity and Momentum balance (Chapter 1, 2)
- Equations of continuity and motion (Chapter 3)
- 2-D and time-dependent flows (Chapter 4*)
- Turbulent flow and Boundary layer (Chapter 5*)
- Polymeric and non-Newtonian liquids (Chapter 8*)
- Thermal conductivity (Chapter 9)
- Energy balance (Chapter 10)
- Diffusivity (Chapter 17)**
- Mass balance (Chapter 18)**
* Note: Selected sections of chapter will be covered.
** Note: If time allows.

Class/Laboratory Schedule
- Location: Domenici Hall 005
- Time: Tuesdays, Thursdays 10:20 – 11:35 am
Instructor

- Dr. Reza Foudazi
  Assistant Professor
  Email: rfoudazi@nmsu.edu
  Tel: 575-646-3691
  Office: Jett Hall Room 257
  Office hours: Tuesdays & Thursdays 11:35 am – 1 pm, or set an appointment via email

Grading

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>Homework</td>
<td>100</td>
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<tr>
<td>Two mid-term exams &amp; Quizzes</td>
<td>300</td>
</tr>
<tr>
<td>Project (presentation: 50, report: 150)</td>
<td>200</td>
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<tr>
<td>Final</td>
<td>200</td>
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<tr>
<td>Total points</td>
<td>800</td>
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Grading Scale:
- A+ ≥ 95%
- A ≥ 90%
- A− ≥ 85%
- B+ ≥ 80%
- B ≥ 75%
- B− ≥ 70%
- C+ ≥ 65%
- C ≥ 60%
- C− ≥ 55%
- D ≥ 40%

Syllabus Preparation Date

- 1/8/15

The NMSU Department of Chemical Engineering maintains a syllabus addendum containing course requirements common to all courses with the CH E prefix online. This document is accessible from the URL:
http://chme.nmsu.edu/academics/syllabi/chme-common-syllabus-addendum/