

CBE 60554
Syllabus
Spring 2014

Content: This course is intended as an overview of the entire subject of transport phenomena at an intermediate to advanced level. Topics will be chosen to include, heat, mass and momentum transfer, with analysis based on the governing continuum equations. Analytical solution techniques and insights from scaling analysis will be emphasized. Application situations will be taken across the many fields of interest to chemical engineers.

Text: William M. Deen
Analysis of Transport Phenomena
Oxford (2012)

Chapters from Text

1. Diffusive Fluxes and Material Properties (1/2 lecture)
2. Fundamentals of Heat and Mass Transfer (1 lecture)
3. Formulation and Approximation (2)
4. Solution Methods Based on Scaling Concepts (2)
5. Solution Methods for Linear Problems (3)
6. Fundamentals of Fluid Mechanics (3)
7. Unidirectional and Nearly Unidirectional Flow (2)
8. Creeping Flow (2)
9. Laminar Flow at High Reynolds Number (2)
10. Forced-Convection Heat and Mass Transfer in Confined Laminar Flows (2)
11. Forced-Convection Heat and Mass Transfer in Un-Confined Laminar Flows (1)
13. Transport in Turbulent Flow (1)
15. Transport in Electrolyte Solutions (2)

Homework:	30%
Midterm exams (Feb12, March 19)	35%
Final Exam (May 8, 8AM)	35%