

CHEG 315: Transfer Operations I

TIME/LOCATION: Tuesdays & Thursdays, 5PM – 6:30PM, Bronwell 124

TEXT: Transport Phenomena, 2nd Edition, by Bird, Stewart and Lightfoot.

PROFESSOR: Benjamin A. Wilhite, Eng II, Unit 3222

Office Hours: 3 -4 PM Tuesdays & Thursdays

PROBLEMS DUE: On due date, typically Fridays by Noon.

NO CREDIT FOR LATE ASSIGNMENTS or MISSED EXAMS UNLESS
PRIOR ARRANGEMENTS MADE WITH Prof. Wilhite

EXAMS: Closed Book, Closed Notes, unless otherwise stated.

COURSE GRADING:

EXAM I:	25%
EXAM II:	25%
EXAM III:	25%
HOMEWORK:	25%

RELATED TEXTBOOKS:

- Laminar Flow and Convective Transport Processes. L. Gary Leal. ISBN 0-7506-9117-4
- Fundamentals of Heat and Mass Transfer, 6th Edition. Incropera, deWitt, Bergman and Lavine. ISBN 0-471-45728-0
- Equations of Mathematical Physics. Tikhonov and Samarskii. ISBN 0-486-66422-8
- Partial Differential Equations for Scientists and Engineers. Farlow, S.J. ISBN: 0-486-67620-X
- Mathematical Methods in Chemical Engineering. Varma and Morbidelli. ISBN 0-195-098218

COURSE CONTENT:

Section I: Fluid Dynamics (Tentatively Weeks 1 – 7)

- Fundamentals: Einstein Notation, Conservation of Mass and Momentum, Newton's Law of Viscosity, Derivation of Navier-Stokes Equations.
- Unidirectional flows at steady-state and transient conditions
- Creeping flow solutions, lubrication theory
- Inviscid flow solutions, implications for aerodynamics, turbulence
- Some advanced topics, including multiphase flow, Kelvin-Helmholtz Instabilities

Section II: Heat Transfer (Tentatively Weeks 8 – 11)

- To be announced

Section III: Mass Transfer (Tentatively Weeks 12 – 14)

- To be announced