MSE 3061 Transport Phenomena
Spring Semester 2019
Department of Materials Science and Engineering

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Pre-Requisites: MATH 1310/1320 or MATH 1210/1220/2210

Lecture: TH 9:10 – 10:30, GC4020
Credit Hours: 3

Text(s): Canvas notes,
Textbook is not required,

Course Description: This course will teach the basic principles of transport phenomena, and provide numerous practical examples that demonstrate 1) application of transport principles to manufacturing of materials, 2) relationships between structure, processing, properties, and performance of materials.

Course Outcomes: a. Graduates will have an ability to apply mathematical, scientific, and engineering knowledge to solve materials related problems.
   b. Graduates will have an ability to select or design a materials based system, component, or process to meet desired needs.
within realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
d. Graduates will have an ability to function on teams whose members have interdependent and complimentary skills
e. Graduates will have an ability to identify, formulate, and solve materials-related problems, and understand the structure, properties, processing, and performance of materials.
g. Graduates will have an ability to communicate technical information effectively in oral and written form.
i. Graduates will have a recognition of the need for, and an ability to engage in life-long learning.
j. Graduates will have an awareness and understanding of current trends and materials applications that affect the materials science and engineering profession.
k. Graduates will have an ability to use the techniques, skills, and modern engineering tools necessary in materials engineering practices.

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**Content Overview:**
The course will cover three major areas in transport phenomena: *Momentum Transport* (viscous properties of fluids, laminar flows, eqs. of continuity and conservation of momentum, flow past objects, turbulent flow), *Heat Transport* (heat transport by conduction, convection, thermal radiation, transient heat flow), and *Mass transport* (diffusion in solid state, mass transport in fluids) as well as their application in real life processes and materials systems.

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**Grading & Evaluation Methods:**
- Home Works - 20%
- Midterm 1 - 20%
- Midterm 2 - 20%
- Group project - 20%
- Final Exam - 20%

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**Key Dates:**
- Monday, January 21st – Martin Luther King Jr. Day Holiday
- Friday, January 18th – Last day to drop classes
- Monday, February 18th – Presidents’ Day
- Friday, March 8th – Last day to withdraw from classes
- Sunday – Sunday March 10th – 17th – Spring Break
- Tuesday, April 23rd – Last day of classes
- Wednesday, April 24th – Reading Day
- **Final Exam:** Monday, April 29th, 8:00am-10:00am
Americans with Disabilities Act Statement: “The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodation in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.”

Faculty and Students’ Responsibilities: “All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, and I will do so, beginning with verbal warnings and progressing to dismissal from class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee.”