



**MSE 5034 Kinetics**  
**Spring Semester 2024**  
**Department of Materials Science and Engineering**

**Instructor:** Dr. Ling Zang  
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**Office Hours:** 2pm – 4pm, MWF, better by appointment (5th floor of SMBB can only be accessed by authorized ID)  
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**Pre-requisites:** C or better in MSE 3032 and Full Major Status in Materials Science & Engineering  
**Lecture:** MWF 10:45 AM – 11:35 AM, MEB 2325  
**Lab:** N/A  
**Credit Hours:** 3

**Text(s):** No Textbook required.  
Lecture Notes, homework assignments and additional reading materials can be downloaded from the course website:  
<http://www.eng.utah.edu/~lzang/mse5034&6034.html>

Since we don't have a primary Textbook, the Lectures notes, together with the additional readings thus provided, are expected to offer sufficient knowledge and information that are needed for well-round understanding of Kinetics. To correlate the "abstract" Kinetics theory to the real practice of materials science engineering, we provide various such real-world examples that help understand the beauty and powerful application of the theories.

**Course Description:** Rate theory and diffusion applied to nucleation, crystal growth, grain growth, recrystallization, precipitation,

sintering, and solid-state reactions; role of kinetics and thermodynamics in development of microstructures. Designed to teach undergraduates in materials science and engineering the basic rate and its application to such solid-state phenomena as diffusion solidification and transformations in solids involving nucleation and growth, spinodal decomposition, and martensitic transformations. The design of experimental techniques to solve materials-related problems is emphasized.

**Primary Course Outcome:** An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

**Content Overview:** The objective of this course is to learn the basic concepts and fundamental principles of kinetics of materials and how to apply them to solve real-world materials problems.

**Grading & Evaluation Methods:** Homework: 20% (No Makeup); Midterm: 30%; Final: 50%.

*Both midterm test and final exam will be open book.*

Two rounds of homework assignments, to be turned as scanned PDF within **Canvas**, with 1<sup>st</sup> round due on 2/22 before 10:45am, and 2<sup>nd</sup> on 4/17 before 10:45am. 5% grade deduction to be applied for each day of delay of turning in.

Grading Scale	A	A-	B+	B	C+	C	D	F
	93-100	90-93	83-90	80-83	73-80	70-73	60-70	< 60

**Key Dates:** Monday, January 15 - Martin Luther King Jr. Day, Holiday  
 Friday, January 19 - Last day to add or drop classes  
 Monday, February 19 - Presidents Day, Holiday  
 Friday, March 1 - Last day to withdraw from classes  
 Sunday – Sunday, March 3 - 10 - Spring Break  
 Tuesday, April 23 - Last day of classes  
**Final exam, Monday, April 29, 10:30 am – 12:30 pm, same classroom**

**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."