**Instructor:** Dr. Ling Zang  
**Office:** Room 5543 SMBB building, 36 South Wasatch Dr.  
**Office Hours:** 2pm – 4pm, MWF, better by appointment (5th floor of SMBB can only be accessed by authorized ID)  
**Phone:** 801-587-1551  
**Email:** LZang@eng.utah.edu  
Course web: [http://www.eng.utah.edu/~lzang/teaching](http://www.eng.utah.edu/~lzang/teaching)

**TA:** Chris Hancock  
**Office:**  
**TA Hours:** by appointment  
**Phone:**  
**Email:** david.c.hancock@utah.edu

**Pre-requisites:** C or better in MSE 3032 and Full Major Status in Materials Science & Engineering

**Lecture:** MWF 10:45 AM – 11:35 AM, JFB B-1  
**Lab:** N/A  
**Credit Hours:** 3

**Text(s):** No Textbook required. Lecture Notes & other course materials can be downloaded from the course website: [http://www.eng.utah.edu/~lzang/mse5034&6034.html](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.

**Course Outcomes:**

a. An ability to apply mathematical, scientific, and engineering knowledge to solve materials related problems.
b. An ability to design and conduct experiments, characterize materials, and properly interpret data in order to understand materials behavior.
c. 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. An ability to identify, formulate and solve materials-related problems.
e. An ability to communicate technical information effectively in oral and written form.
f. An awareness and understanding of current trends and materials applications that affect the materials science and engineering profession.
g. An ability to use the techniques, skills, and modern engineering tools necessary in materials engineering practices.

**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%.

Homework due in two weeks after assignment (turn-in date to be announced). 20% grade deduction to be applied for each week of delay of turning in.

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<thead>
<tr>
<th>Grading Scale</th>
<th>A</th>
<th>A-</th>
<th>B+</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
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<tbody>
<tr>
<td></td>
<td>93-100</td>
<td>90-93</td>
<td>83-90</td>
<td>75-83</td>
<td>65-75</td>
<td>50-65</td>
<td>&lt; 50</td>
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**Key Dates:**

Monday, January 21st - Martin Luther King Jr. Day, Holiday
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Wednesday, January 18th</td>
<td>Last day to drop classes</td>
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<tr>
<td>Monday, January 18th</td>
<td>Last day to add classes</td>
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<tr>
<td>Monday, February 18th</td>
<td>Presidents’ Day, Holiday</td>
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<td>Friday, March 8th</td>
<td>Last day to withdraw from classes</td>
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<td>Sunday – Sunday, March 10th</td>
<td>Spring Break</td>
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<td>Tuesday, April 23rd</td>
<td>Last day of classes</td>
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<td>Wednesday, April 24th</td>
<td>Reading Day</td>
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<tr>
<td>Monday, April 29, 10:30 am–12:30 pm</td>
<td>Final Exam</td>
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**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.”