MATSCEN 6737 (Proposed): Diffusion and Interface Kinetics

Course Description

Detailed atomic and phenomenological descriptions of rate limiting steps, diffusion, and interface kinetics with applications involving mass transport and phase transitions in the solid state

Prior Course Number: 737

Transcript Abbreviation: DifInterKin

Grading Plan: Letter Grade Course Deliveries: Classroom Course Levels: Graduate

Student Ranks: Masters, Doctoral Course Offerings: Autumn, Spring Flex Scheduled Course: Never Course Frequency: Every Year Course Length: 14 Week

Credits: 3.0 **Repeatable:** No

Time Distribution: 3.0 hr Lec

Expected out-of-class hours per week: 6.0

Graded Component: Lecture **Credit by Examination:** Yes

Exam Types: EM Tests via Office of Testing

Admission Condition: No **Off Campus:** Never

Campus Locations: Columbus

Prerequisites and Co-requisites: Grad standing in MSE or permission of instructor. Not open to students with

credit in MSE 732.

Exclusions: Cross-Listings:

The course is required for this unit's degrees, majors, and/or minors: No

The course is a GEC: No

The course is an elective (for this or other units) or is a service course for other units: Yes

Subject/CIP Code: Subsidy Level:

Programs

Abbreviation	Description					
MATSCEN	Materials Science and Engineering					

Course Goals

To provide a fundamental understanding of diffusion-controlled kinetics in the solid state.

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Diffusion								

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Kinetics of diffusion-controlled phase transformations								
Microstructural evolution								

Grades

Aspect	Percent
Homework	20%
Midterm Exam	40%
Final Exam	40%

ABET-EAC Criterion 3 Outcomes

Course Contribution		College Outcome
	a	An ability to apply knowledge of mathematics, science, and engineering.
	b	An ability to design and conduct experiments, as well as to analyze and interpret data.
	С	An ability to design a system, component, or process to meet desired needs.
	d	An ability to function on multi-disciplinary teams.
	e	An ability to identify, formulate, and solve engineering problems.
	f	An understanding of professional and ethical responsibility.
	g	An ability to communicate effectively.
	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
	i	A recognition of the need for, and an ability to engage in life-long learning.
	j	A knowledge of contemporary issues.
	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

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