

MSE 403: Synthesis of Materials

Fall 2016

Instructor:

Prof. Daniel Shoemaker

Email: dpshoema@illinois.edu

Office: 112 Materials Research Laboratory

Office Hours: Email for appointment

Grader: To be announced on Compass

Class Schedule: Tuesday/Thursday 9:30 – 10:50AM, 4101 MSEB

Course Materials: No textbook is assigned for this class. This makes assigned handouts, chapters, and articles very important. Reading material will be posted on Compass and *all are required reading*.

Grading:

15% Homework: approximately biweekly, 40% late penalty per 24 hours

15% In-class activities, including quizzes, daily reading questions

20% Midterm 1: In-class

20% Midterm 2: In-class

30% Poster Project: During Finals slot

Objectives:

Understand the processes, energy balance, and motivation for compound formation

Learn general methodologies for materials synthesis in a variety of systems

Suggest and evaluate reasonable syntheses for a variety of applications

Investigate one arena of synthesis in detail and present a poster to your peers

Topics:

Origins and synthesis of Metals, Ceramics, Polymers:

Chemical bonding

Thermodynamics

Thermal synthesis, Oxidation and Reduction

Kinetics and Catalysis

Nucleation and Growth

Vapor Deposition

Sol-gel Techniques

Nanomaterials

Grades will be assigned using the following scale:

A+ = 98-100%

A = 93-97%

A- = 90-92%

B+ = 88-90%

B = 83-87%

B- = 80-82%

C+ = 78-80%

C = 73-77%

C- = 70-72%

D+ = 68-70%

D = 63-67%

D- = 60-62%

F < 60%

At my discretion, the minimum score needed to earn a certain letter grade may be lowered, but it will not be raised.

Ethics:

Plagiarism of text, data, figures, graphs, etc., is strictly not allowed. Instances of plagiarism will result in a zero grade for the assignment for all authors. Please read and understand the rules:

www.library.uiuc.edu/learn/research/academicintegrity.html

Instances in which answers are copied (from *any source*, including references, classmates, or old answer sets) will result in sanctions in accordance with the Illinois Student Code, ranging from a zero grade for that assignment to immediate failure in the course.

Sharing clickers is an insta-fail offense and not worth the meager points. Don't bother.

Resources for Students in Distress:

Take care of yourself, your friends, and acquaintances. For personal or academic issues it is important to remember that many consulting options are available to students, through the College of Engineering (206 Eng Hall, walk-in during business hours), McKinley, or the Counseling Center (<http://counselingcenter.illinois.edu/>). If you would like to speak to someone about a situation you've encountered, please call the Counseling Center at 217-333-3704, or the after-hours Crisis Line at 217-359-4141.

Emergencies can occur any time:

Run: Leave the area as fast as possible. MSEB has twin staircases on its East/West ends.

Hide: Shelter in place if necessary. The MSEB basement is a tornado shelter.

Fight: Enrollment of MSE 403 is 46. I expect us to team up.

If you are in a safe location, wait for Illini-Alert updates. Sign up for text alerts.