MSE 395: Materials Design Spring 2018 Course Syllabus

Faculty: Prof. Shen J. Dillon, Dr. Matthew D. Goodman

Class Description and Objectives

Design of various engineering devices, objects, or systems. Team-based and faculty-guided projects directed toward the development of materials-based solutions to problems originating from student, faculty, and industrial suggestions. Solutions are based on the knowledge, skills, and design experience acquired in earlier course work and incorporate engineering standards and realistic constraints such as economic, environmental, sustainability, manufacturability, ethical, health and safety, social, and political concerns.

MSE 395: Materials Design

3 cr., Spring 2018 CRN: 38216 151 Loomis Laboratory Friday 12:00 – 1:50 PM

Contact

Prof. Shen J. Dillon sdillon@illinois.edu 172 Materials Research Lab (217-244-5622)
Dr. Matthew D. Goodman mgoodman@illinois.edu 210 Ceramics Building (217-244-9253)

Office Hours: By appointment

Course websites:

Basecamp.com (you’ll receive an invite) and Compass

Grading Policies

5% Group Work Agreement
5% Objective Statement & Timeline
10% Literature Review
10% Progress Reports to Faculty Advisor
   (at least 6 including literature review / initial work plan meetings)
20% Midterm Presentation
25% Final Poster
25% Final Paper

Preliminary Grading Scheme:

A: 90 – 100 % B: 80 – 89.9 % C: 70 – 79.9 % D: 60 – 69.9 %

Project Advisor: Faculty or industry mentor that provides background information, considered a technical resource. Available for specific questions and guidance, but they are not providing solutions.

Course Advisor: Projects are assigned to either Prof. Dillon or Dr. Goodman to assist with course-related questions, deliverables, etc., and receive the Biweekly Progress reports.


**Schedule**

Jan 25: Group Work Agreement, Objective Statement, Timeline Due  
Feb 8: 20-minute Literature Review presentation to course advisor  
Feb 15: Initial Work Plan  
Feb 22: Deadline to Order Supplies & Complete Hazard Analysis  
Feb 22: Approach and Work Plan Presentation  
Mar 1: Approach and Work Plan Presentation  
May 10: Final Paper due  
Finals Week (exact day & time TBD): Poster Presentation

**Course Elements**

*Work Agreement*: The roles and responsibilities of each group member should be defined and agreed upon by all group members with respect to decision making, interactions, delegation, management, and accountability.

*Literature Review*: A 20 minute presentation to the faculty advisor outlining the problem statement, the relevant background necessary to address the problem, specific design goals, and a preliminary plan or approach.

*Initial Work Plan*: The initial work plan will outline the teams approach and serve as the basis for the final work plan, hazard analysis, and the faculty should provide initial feedback regarding scope, feasibility, and safety.

*Approach and Work Plan*: The approach and work plan presentation will be ≈15 mins. It will be presented to and partially evaluated by your peers. Therefore, it should provide sufficient background for the general materials scientist to understand and appreciate the project problem, design goals, and proposed work plan. The class will be divided into 4 sections, where 2 sets will present in two different locations on two different dates (note the two different dates on the schedule).

*Final Paper*: A detailed yet concise description of the accomplishments made towards the design project during the semester including the relevant background, problem statement, design goals, and new progress made.

*Poster Presentation*: A poster session will be held during finals week that is open to the public. Posters approximately 3’ x 4’ will be displayed during a 90 minute session. Each group will be expected to present their results to those in attendance.

**Lecture Schedules**

We plan to have optional lectures during the scheduled class session between 12:00 and 12:50 on Fridays. These will address topics relevant to the course work, e.g. materials selection, experimental design, literature review, etc.