Prerequisites: MSE 201
Laboratories/Lectures: Wednesday 3:35-5:30
Location: Dougherty 522

Instructor: Dr. Philip D. Rack
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Office Hours: by appointment

**General Description:**

The learning objectives of this course are to: (1) gain hands-on experience in conducting laboratory experiments involving fundamental principles in materials science and engineering, (2) understand the design of an experiment relative to the measuring and performance capabilities of a piece of equipment, (3) gain experience in analysis of data and writing reports in the accepted scientific format, and (4) take responsibility for a project and learn how to make an effective oral report on the project. The content directly supports MSE program education outcomes 2, 3, 4, 5, and 7.

Hands-on sample preparation, characterization, and data analysis for introductory studies of crystal structures, microstructures, physical properties, and mechanical properties; Report writing skills including word processing and graphics usage; Oral presentation skills.

The format for the class is Lecture/Laboratory.

**Class References:**
Class Notes


MSE 300 Introduction to Materials Science and Engineering Class Policies:
This list of rules may seem arbitrary, long, and severe.
Unfortunately, there is a story behind each rule. The stories range from the mundane and expected to the bizarre. The vast majority of you will never come up against any of the rules. Nonetheless, it seems that there is at least one individual in every class that needs them.
1. Use e-mail for easy questions and to setup special appt. times.
2. Please display proper decorum during class
Examples of poor decorum: sleeping, reading the newspaper, arriving late to class, talking to neighbor, leaving during class….
3. When you have questions, ASK !!
4. When I ask questions, ANSWER !
5. Class attendance is mandatory. Class attendance will improve your chances of learning the material more thoroughly. While attendance records will not be officially kept, students who attend classes and review sessions, ask questions and attempt to answer questions by the instructor will be given the benefit of the doubt if their grade is borderline.

Rules for Laboratory Assignments:
1. Laboratory Reports are due at the start of class on the day indicated in the class section that you are registered for.
The "start of class" is the time at which Dr. Rack begins the lecture. Any assignment handed in after that time will be considered late:
Handed in day due Max. Score Possible = 70%
Handed in next day Max Score Possible = 50%
Handed in after 5 PM Max Score Possible = 0%

See Laboratory Report Guidelines for specific information on how to prepare the laboratory reports

Evaluation (Tentative):
Laboratory Notebooks: 10%
Laboratory Reports: 65%
Final Oral Presentation and Report: 25%
Tentative Laboratories (some modifications are likely)

1. Mounting, Polishing, and Etching of a Plain Carbon Steel Sample
2. Mounting Polishing and Etching of a Cast Iron Sample
3. Grain Size Determination
4. Microhardness Evaluation
5. Case Depth Examination
6. Charpy Impact and Scanning Electron Microscope (SEM) Examination