

University of Notre Dame
Department of Aerospace and Mechanical Engineering

AME 60646

Failure of Materials

Fall 2015

- Instructor: Ryan K. Roeder, Associate Professor
148 Multidisciplinary Research Building, 1-7003
rroeder@nd.edu <http://www.nd.edu/~rroeder>
- Teaching Assistants: Tracie McGinnity, MRB 201, Tracie.L.McGinnity.4@nd.edu
Tyler Curtis, MRB 225, tcurtis2@nd.edu
- Lecture: MW 3:30-4:45 p.m., DBRT 308
- Office Hours: Weekly scheduled office hours TBA, otherwise an “open door” policy.
- Required Textbook: T.L. Anderson, *Fracture Mechanics: Fundamentals and Applications*, Third Edition, CRC Press, 2005. K. Bowman, *Mechanical Behavior of Materials*, First Edition, John Wiley and Sons, Inc., 2004.
- Prerequisites: AME 20241 Mechanics of Materials, CBE 30361 Materials Science
- GOALS: The goal of this course to provide a fundamental framework for understanding and preventing the failure of engineering materials. For both fracture and fatigue, emphasis will be given to the (1) underlying physical mechanisms, (2) material structure-property relationships, and (3) theories, models, and their limitations. The course will cover content applicable to a diverse spectrum of career interests, enabling students to engineer materials for current and future generations of technology.
- Grading:
- | | | |
|------------|-----|--|
| Midterm | 25% | Fri. Oct. 2, location and time TBD |
| Final Exam | 25% | take home, due date TBD |
| Homework | 25% | handed out in class and posted on website |
| Project | 25% | due 5 p.m. Tues. Nov. 24, presentations in class |
- Examinations: Exam format and content will be announced in class. The final exam will be comprehensive but biased toward the more recent material. Exams will be taken as scheduled, except in the case of illness or serious emergency. Contact the instructor *before the exam* to schedule a makeup exam.
- Homework: Use of mathematical software packages (e.g. Matlab, Mathcad, etc.) is encouraged. Discussion of homework problems is also encouraged; however, each student is expected to submit his or her own independent solution. Late homework will generally not be accepted except in the case of illness or serious emergency. Contact the instructor *before the due date* (if possible) to arrange an acceptable due date.
- Project: The project will comprise a failure analysis case study with a written report and an oral presentation.
- Class Participation: In order to participate in class, one must be present and prepared. Lectures will involve discussion of reading or homework assignments.
- Academic Honesty: Students should be familiar with the Academic Code of Honor (<http://honorcode.nd.edu>). Working together, asking questions of classmates, or assisting others on exams is prohibited.

Additions, amendments, or corrections to this syllabus may be made throughout the semester via in class announcements, handouts, or e-mail.