

MEE320

SPRING 2005

Instructor: Michael “Mick” Peterson, Ph.D.
Office Hours: T, Th 10:15-11:15 p.m. and t.b.a. or *e-mail* to make an appt.
Office Location: 208 Boardman
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Text: Michael F. Ashby, *Materials Selection in Mechanical Design*, Butterworth Heinemann, 1999
Supplementary Text: Several standard materials texts will be on reserve in library for this class.
Class Room: Boardman 310
Class Meeting: T, Th 8:00 to 9:15 a.m.

I. PHILOSOPHY

This course is intended to reinforce previous courses in mechanics, chemistry and physics. A particular emphasis of the course is on providing an understanding of how materials selection fits into the design process. The use of appropriate materials is critical to the success of engineering designs. Design courses tend to evaluate failure based on criteria derived from strength objectives or strain to failures. However, the strength of a real engineering material is not a fundamental value that can be related directly to atomistic elements and changes to the material based on environmental conditions and the condition of the material. Thus, a more basic understanding of the mechanisms of failure of a material are required in order to understand the real choices that are made in the mechanical allowables that are chosen during engineering design. This class will provide an opportunity to practice skills as well as to demonstrate proficiency. In addition, an engineer needs to know when to perform analysis. Occasional problems will be included as homework that address this objective, and this will be a primary objective of the design portion of the class.

II. COURSE OBJECTIVES

- To introduce approaches to selecting materials for Mechanical Design using criteria based on material performance.
- To introduce the various forms of failure that materials undergo in normal as well as hostile environments. To reinforce basic problem analysis skills.
- To learn through practice, the design skills needed for the engineering profession.

III. EXPECTATIONS

- Attend class, attendance will not be taken, but it is the responsibility of students to obtain any information from their peers if they miss class. Class participation is graded so the positive marks cannot be applied to your grade if you do not attend class.
- Homework is a significant factor in this course. The homework must be completed neatly and turned in using the approved format. Any homework that is late or deviates from the specified format will not be graded at the discretion of the instructor and grader. Solutions will be posted.
- It is expected that all academic honesty issues will conform to University regulations and that everyone will maintain a level of professionalism such that no issues will arise in this area. The policy on academic integrity is available and should be reviewed.

IV. GRADING

Aspect	Points	Total
Quizzes	2@15%	30
Homework and short quizzes		40
Term Project		20
Class Participation/Recitation		10
	Total	100

Homework will be graded and returned. Homework will become part of your class notes. Class notes MAY be graded and included as part of your homework grade depending on the need for clarification. Homework will be graded individually but can represent collaboration with your colleagues. Short one or two answer in class exercises may also be given. Those exercises will count as a part of your homework grade.

The quizzes represent a significant portion of your grade. It is expected that a large variation between class members will be in this area. If you miss any quiz you will need to have a reasonable excuse. If the excuse is deemed to be reasonable by me, your class grade will depend on the grades you have received on the quizzes which you have taken. Chronic absence from quizzes and class or clearly marginal excuses can result in assignment of a zero on those exams. If you have any questions about this rule ask! All questions regarding quizzes or assignments must be submitted within 24 hours of return of the assignment. The question must be in writing and must be accompanied by the original unmarked copy of the assignment. You will receive a written reply to all grading questions as well. No exceptions will be made to the policy of no verbal discussion of grading details or clarification. Quizzes represent individual effort and absolute personal integrity is expected. The design project final grade will be based on a presentation. A review form will be provided to you to help you to prepare your written and oral documents.

Class participation!!! You will be graded on your ability to respond to a question at the beginning of class based on the reading assigned from the prior class. You should be able to explain the case for the day and describe the tradeoffs that are being made. This will develop over the course of the semester. If you want to clarify the statements of a class member then you should be sure that I have your name.

V. ABET

Program objectives met with this course : An ability to apply knowledge of mathematics, science and engineering and an ability to identify, formulate and solve engineering problems.

VI. ADDITIONAL INFORMATION

Any student requiring an accommodation due to a disability is encouraged to speak to the instructor privately at the beginning of the semester. Appropriate arrangements will be made to accommodate the student.