

EGR 3323 - MACHINE DESIGN Spring 2003

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Text:

- ***Mechanical Design of Machine Elements and Machines***, Collins, Wiley, 2003.

Catalog Data:

The fundamentals of machine elements in mechanical design. Includes the analysis of components under static and fatigue loadings, and the analysis, properties, and selection of machine elements such as shafts, gears, belts, chains, brakes, clutches, bearing, screw drives, and fasteners. (3-0)

Prerequisites:

EGR 3320, EGR 3322 or concurrent enrollment

Prerequisites by topic:

Concepts of stress and strain. Basic material strength and stiffness properties. Stress and deflection analysis under axial, torsional, and bending loads. Statics and dynamics. Calculus & differential equations.

Course Elements:

1. Pressure Vessels
2. Columns Design
3. Static and Fatigue Failure Analysis
4. Shaft Design
5. Screws
6. Belts
7. Brakes/Clutches
8. Chains
9. Gears
10. Impact Loading

Course Objectives:

- To extend the coverage of stress analysis beyond the introductory strength of materials course.
- To apply knowledge of strength of materials, statics, and dynamics to understanding the principles of, and design of, common machine components.

Your abilities will be advanced in the following general areas:

- Apply knowledge of mathematics, science, and engineering
- Design a system, component, or process to meet a desired need
- Identify, formulate, and solve engineering problems
- Use the techniques, skills, and modern engineering tools necessary for engineering practice

Computer Usage:

Selected homework problems will be solved using Mathcad and/or Excel.

Blackboard:

Course information can be obtained on-line through **Blackboard**, which can be accessed at <http://my.baylor.edu>, or from my homepage (url given above), or from the *Current Students* page from the Baylor homepage.

Coursework & Grading:

- There will be three (3) semester exams and a final exam.
- There will be graded homework assignments on a regular basis.
 - o Problem solving – solution of machine design problems. Students are encouraged to collaborate on these problems. However, each student shall prepare and submit his/her solutions independently and is responsible for understanding the material, as opposed to transcribing someone else's work. Problem solving assignments shall, unless otherwise instructed, be handed in by 4:00 pm each Monday. Assignments handed in between Monday at 4:00 pm and the beginning of class on Wednesday will be scored and the resultant score will be multiplied by 0.6. Assignments will not be accepted after the beginning of class on Wednesday.
- Class attendance and participation in classroom activities are essential to a successful experience in this class. Ten (10) or more absences from this class will result in a failure to complete the course. Absences will be recorded at the beginning of class. If you are tardy, you may be counted absent.

• Grading:	Semester exams: 3 @ 20 % =	60 %
	Final Exam	20 %
	<u>Problem Solving Assignments</u>	<u>20 %</u>
	TOTAL	100%

EXAM SCORING

Each problem on an exam will generally be scored on the following 10 point scale (exceptions may occur):

10 points	Work correctly done and answer correctly reported
9 points	Work correctly done, but units missing or answer otherwise not clearly reported; minor calculation error
8 points	Correct solution approach and process, but serious error(s) in calculation or calculation is incomplete
6 points	A conceptual error in the solution process; solution approach not completely defined
3 points	A major conceptual error or multiple conceptual errors in the solution process
0 points	No significant attempt at problem solution