

Strength of Materials Syllabus

ETec 225 Strength of Materials

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Text:

Riley, W. F., L. D. Sturges, & D. H. Morris, *Statics and Mechanics of Materials: An Integrated Approach 2nd Ed.*, Wiley, 2002

Course Objectives : Strength of Materials is the study of stresses and strains on rigid bodies under static loads. At the end of this class, students will be able to analyze stress and deflection in rigid bodies due to axial, shear, torsional, and bending loads, as well as combined loads. Students will also reinforce creative problem solving, communication, and teamwork skills as part of this course.

Course Grading:

Homework:	24%
Laboratories:	16%
Tests (2):	20% ea.
Design Project:	20%
Final Exam:	Special (see description)

Course Outline:

Week 1: T 3/30: Trusses and Review of Axial Loading – Read Sec. 6.6, Review/Read Chp. 4
R 4/1 : Centroids – Read Sec. 5.7 – 5.9

Week 2: T 4/6: Torsion – Read Chp. 7 (skip Sec. 7.5)
R 4/8: Torsion cont.

Week 3: T 4/13: Flexural Loading: Stress – Read Chp. 8
R 4/15: Flexural Loading: Stress cont.

Week 4: T 4/20: Flexural Loading: Deflection – Read Sec. 9.1 – 9.3
R 4/22: **TEST 1: Through Chp. 8**

Week 5: T 4/27: Flexural Loading: Deflection – Read Sec. 9.4 – 9.6
R 4/29: Flexural Loading: Deflection – Read Sec. 9.7 – 9.9

Week 6: T 5/4: Combined Loadings – Read Sec. 10.1 – 10.6
R 5/6: Combined Loadings cont. – Read Sec. 10.7 – 10.12, 10.14

Week 7: T 5/11: more examples
R 5/13: **TEST 2: Through Chp. 10**

Week 8: T 5/18: Columns (Buckling) – Read Chp. 11
R 5/20: Buckling cont.

Week 9: T 5/25: Failure Theories – Read Sec. 10.15 – 10.16
R 5/27: Failure Theories

Week 10: T 6/1: Fatigue
R 6/3: Review & **Project Presentations, Final Project Due**

Homework: Homework assignments are due **at the beginning of class**. There will be a homework assignment due every Tuesday starting the second week of class. Students are encouraged to work on homework in teams, although everyone must turn in their own assignment. Late homework will be accepted, however, late assignments will lose credit on the following

schedule:

Tuesday at end of or after class: -10%

Wednesday: -20%

Thursday: -50%

Friday: -75%

No credit as of the following week

Homework solutions will be posted on Blackboard at the end of the day on Wednesdays. The homework assignments and due dates for the quarter are:

Due Tues. 4/6: 4-109, 4-110, 5-99, 5-102, 6-83, 6-87

Due Tues. 4/13: 7-7, 7-13, 7-47, 7-53, 7-60, 7-76

Due Tues. 4/20: 8-3, 8-4, 8-30, 8-63, 8-65, 8-71, 8-81, 8-109

Due Tues. 4/27: 9-15, 9-22, 9-28, 9-36

Due Tues. 5/4: 9-42, 9-51, 9-59, 9-77, 9-104, 9-111

Due Tues. 5/11: 10-30, 10-46, 10-47, 10-101, 10-123, 10-125, 10-129, 10-133

Due Tues. 5/18: 10-138, 10-140, 10-143, 10-191

Due Tues. 5/25: 11-3, 11-10, 11-11, 11-17, 11-44, 11-61

Design Project: The design project will be an extension of the foundry lift project from Applied Engineering Statics. There will be some intermediate due dates, but the final project report and team project presentation are due on the last day of class, 6/3/04.

Tests: 2 midterm exams will be given in class on April 22 and May 13. Students will have the entire class period for the exam, and may bring one 3"x 5" formula card to each exam. Students who must miss an exam and want a make-up exam must have a valid excuse and make arrangements beforehand. Make-up tests will not be given if no prior arrangements are made, except in the most dire of circumstances, and the make-up exam may be an oral exam.

Laboratories: Eight formal laboratory exercises will be conducted during the laboratory periods in teams of 2-3 students. Students are expected to attend and participate in laboratory exercises in order to receive credit. In addition, students are expected to turn in a summary of laboratory activities the week after a laboratory is completed. Students may also be required to complete preliminary calculations before the actual laboratory experiment or exercise.

Final Exam: The final exam is scheduled for Tuesday, June 8, 2004 at 1:00 p.m. As with the midterm exams, students will be allowed one 3"x 5" formula card. The final exam is required for all students, and will result in one of three outcomes: If a student's final exam score is higher than his or her combined test and homework average the final exam will replace the test, homework, and laboratory grades (the design project grade will remain the same). If a student's final exam score is below his or her test average, but is passing (>60%) the final exam will not figure into the final grade. If a student's final exam grade is below passing (<60%) he or she will lose 10 points (i.e. one letter grade) from the class grade.