

THE UNIVERSITY OF MANITOBA
Department of Mechanical and Manufacturing Engineering
STRESS ANALYSIS & DESIGN (MECH3502)
2009/2010

Instructor:

Dr. Christine Q. Wu, EITC E1-414

Objective:

To develop the ability to analyze and design varying load-bearing members and machines using the fundamental principles in mechanics of materials.

Prerequisites:

MATH2130 Introduction to Numerical Methods for Engineers, MECH2222 Mechanics of Materials.

Text:

F. P. Beer, E. R. Johnston, Jr., J.T. DeWolf and D. F. Mazurek, Mechanics of Materials, 5th edition.

Topics:

- Introduction to Unsymmetric Bending Ch4, Sec 4.13
- Transverse Loading – Shear Center Ch6, Sec 6.9
- Stress/Strain Transform – Failure Theories and Strain Rosette Ch7, Sec 7.7-7.11, 7.13
- Beam Design Ch5, Sec 5.4, 5.6
- Beam Deflections Ch9, Sec 9.1-9.5, 9.7, 9.8
- Energy Methods Ch11, Sec 11.1-11.5, 11.9-11.14
- Introduction to the Torsion of Non-Circular Sections Ch3, Sec 3.12, 3.13
- Columns Ch10, Sec 10.1-10.4

Lecture Times:

M, W, F: 10:30-11:20 EITC E2-110.

Tutorial Time:

Wednesday: 12:30am - 2:30pm EITC E2-110.

Evaluation:

Assignments (5)	15%
Term Test I	10% (October 14, closed book/notes)
Term Test II	10% (November 18, closed book/notes)
Project (1)	15%
Final Exam (2 hours)	<u>50%</u> (closed book/notes)
	100%

Note: You are allowed one 8.5 X 11-inch information sheet for the term test (one side only).

You are allowed one 8.5 X 11-inch information sheet for the final examination (both sides).

All assignments must be handed in at the deadlines. Late assignments will be subject to 20% deduction of the total mark of the corresponding assignments for each day of delay up to 3 days. After 3 days, the solution will be posted on the course homepage, and the assignments will be corrected, but not marked.

Finally, students are reminded that they must remain available until all examination and test obligations have been fulfilled. Examination period: December 10 to December 23, 2009, inclusive.

Students are also reminded to review the General Academic Regulations and Requirements of the University of Manitoba on *plagiarism and cheating* (Section 7.1) as well as the University of Manitoba policy on *examination personation* (Section 7.2) from:

<http://webapps.cc.umanitoba.ca/calendar07/regulations>