

THE UNIVERSITY OF TOLEDO
CIVE 1160:041 Engineering Mechanics: Strength of Materials
Summer Semester, 2009 MTWR 11:00 - 11:50 PL3190
Instructor: Dr. Andrew G. Heydinger [Link to Class Notes](#)

Week	Date	Day	Meeting	Study Assignment	Quiz	Problem Assignment
1	5/18/09	M	1	1.1, 1.2		1-1, 1-3, 1-5, 1-13, 1-27
	19	T	2	1.3, 1.4	1	1-37, 1-43, 1-41
	20	W	3	1.5		1-35, 1-51, 1-55
	21	R	4	1.6, 1.7	1	1-81, 1-83, 1-95
2	25	M	Memorial Day – No Classes			
	26	T	5	2.1, 2.2		2-3, 2-7, 2-11
	27	W	6	2.2		2-13, 2-23, 2-27
	28	R	7	3.1, 3.2, 3.3		3-1, 3-7, 3-9
3	6/1/09	M	8	3.4, 3.5		3-13, 3-19
	2	T	9	3.6, 3.7, 3.8		3-26, 3-33, 3-35
	3	W	10	4.1, 4.2	2	4-1, 4-3, 4-7, 4-19
	4	R	11	4.3, 4.4		4-31, 4-36, 4-45, 4-47
4	8	M	12	4.5		4-36 (Force Method)
	9	T	13	4.6		4-75, 4-77, 4-83
	10	W	14	5.1, 5.2		5-1, 5-5, 5-9, 5-17
	11	R	15	5.3		5-33, 5-35
	15	M	16	5.4, 5.5		5-46, 5-49, 5-55, 5-73
5	16	T	17	6.1		6-1, 6-3, 6-10, 6-17
	17	W	18	6.2		6-21, 6-34
	18	R	19	First Exam		
	22	M	20	6.3		6-43, 6-49
	23	T	21	6.4		6-73, 6-95
6	24	W	22	7.1, 7.2		7-1, 7-7, 7-13
	25	R	23	7.3		7-18, 7-25
	29	M	24	7.4		7-37, 7-45
	30	T	25	8.1		8-3, 8-7, 8-11
	7/1/09	W	26	8.2		8-15, 8-23, 8-27, 8-47
	2	R	27	9.1, 9.2		9-1, 9-2, 9-7, 9-11
	6	M	28	9.3	3	9-15, 9-31, 9-45
7	7	T	29	9.4, 9.5		9-57, 9-59, 9-71
	8	W	30	9.6, 9.7		9-81, 9-90
	9	R	31	10.1, 10.2		10-2, 10-11
	13	M	32	10.3, 10.4		10-15, 10-27
	14	T	33	10.5		10-29, 10-31
8	15	W	34	10.6		10-34, 10-45
	16	R	35	Second Exam		
	20	M	36	11.1, 11.2		11-2, 11-3
	21	T	37	11.2		11-15
	22	W	38	11.4		11-38, 11-47
9	23	R	39	12.1		12-1, 12-3
	27	M	40	12.2		12-5, 12-22
	28	T	41	12.5		12-89, 12-93
	29	W	42	12.6, 12.7		12-122
	30	R	43	13.1		13-6
10	8/3/09	M	44	13.2		13-22
	4	T	45	13.3		13-21, 13-42
	5	W	46	Review/Course Evaluation		
11	6	R	47	Final Exam		Time: TBA

Quiz or Exam Problem Number: [1](#), [2](#), [3](#), [4](#), [5](#), [6](#), [7](#), [8](#), [9](#), [10](#), [11](#), [12](#), [13](#), [14](#)

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MTWR 11:00 - 11:50 PL3190

Instructor: Dr. Andrew G. Heydinger
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Office Hours: 12:30 - 1:30 MTWR, other times as required.

Objectives: Professional engineers are required to have a thorough understanding of the engineering properties of materials and the mechanical behavior of members used for engineering purposes. Engineers should also be able to clearly demonstrate competence in performing engineering calculations culminating in effective engineering design. At the conclusion of this course, you should understand basic material properties, prismatic and circular member loading conditions, and prismatic and circular member behavior. You should be able to compute stress or strain at a point in any direction due to applied loadings. You should be able to apply theoretical equations in engineering calculations for design purposes.

Topics to be Covered:

1. Stress and strain.
2. Mechanical properties of materials.
3. Axially loaded members, including thin wall pressure vessels.
4. Axial load applications: Stress-strain relationships, stress and strain transformations.
5. Torsion: solid and hollow circular sections.
6. Torsional load applications: Stress-strain relationships, stress and strain transformations.
7. Beam: shear and bending moment diagrams, bending stress, transverse shear, deflection.
8. Combined axial and torsional stress.
9. Transformation of stress and strain.
10. Buckling of long columns.

Text: Mechanics of Materials, 7th edition by R. C. Hibbeler (Required)

Prerequisite: Must have passed CIVE1160 Engineering Mechanics: Statics

Lectures: Lectures cover topics included in the text and also provide insights into theories and applications to engineering design, which cannot adequately be covered in textbooks. Therefore, attendance and participation in all lectures is **strongly recommended**.

Assignments: Assignments are essential to learning the material and to improving understanding. Assignments should be neatly presented on **one side of the paper only**. Problems should be **stated with the work shown and the answers underlined**. You may consult with your classmates on assignments but only your own work may be submitted. Homework will be collected each Monday from the problems assigned the previous week. Late assignments will not be accepted.

Course Grade: Homework problems	15%
Quiz and final exam problems	85%
[Quiz and exam problems are all worth the same amount]	

Additional Problems for Honors Students

1-24, 1-68, 1-100

2-16, 2-20

3-20, 3-40

4-20, 4-40, 4-80

5-40, 5-68, 5-140

6-12, 6-24, 6-80

7-28, 7-44

8-61, 8-74

9-25, 9-76, 9-104

10-8, 10-20, 10-46

11-4, 11-42

12-8, 12-127

13-40

Make up a notebook to put these problems in. Submit them on the first class after each exam and on August 4.