

AE 733 – Advanced Mechanics of Materials  
Fall 2003

2003/1/21  
Kosuke Ishikawa

**Instructor:** Dr. Walter J. Horn

**Office:** 201 Wallace Hall

**Office hours:** By appointment

**Recommended Text:** *Advanced Strength and Applied Stress Analysis*, R. G. Budynas

**Additional References:** *Applied Elasticity*, C. T. Wang  
*Mechanics of Materials*, E. P. Popov  
*Advanced Strength and Applied Elasticity*, A. C. Ugural & S. K. Fenster

**Course Objective:**

1. Extend the development of the introductory course of analysis of deformable solids to include the advanced topics associated with classical mechanics of materials
2. Provide an introduction to the concepts of the theory of elasticity
3. Introduce the energy approach to basic stress analysis
4. Provide an introduction of the principal modes of failure of a solid body

**Tentative Schedule**

Topic	Number of Lectures
Basic Concepts of Force, Stress, Strain, and Displacement (Chap. 1)	1
Stress and Strain, Transformations, Equilibrium, and Compatibility (Chap. 2)	1
A Review of the Fundamental Formulations of Stress, Strain, and Deflection (Chap.3)	2
Concepts from the Theory of Elasticity (Chap. 4)	3
<i>Exam 1 (Chap. 1-4)</i>	
Topics from Advanced Mechanics of Materials (Chap 5)	6
Energy Techniques in Stress Analysis (Chap. 6)	7
<i>Exam 2 (Chap. 5-6)</i>	
Strength, Failure Modes, and Design Considerations (Chap. 7)	8
<i>Final Exam</i>	

**Homework:** Homework assignments will be collected at the beginning of the class period that it is due. They will not be accepted at any other time. Your work should be neat and organized to be graded. Please use 8½" x 11" paper (one side only). All problems of each assignment will be collected.

**Exams:** There will be three exams of equal weight during the semester.

**Grading:** The following weighting factors will be used in the computation of the final course grade.

Homework	10%
Two Major Exams	60%
Final Exam	30%

Grades of individual exams will not be "scaled" or "curved", but a scale is occasionally applied to the total graded material at the end of the semester. After the final scaling has been applied grades are determined by the traditional guidelines of:

90-100 ⇒ A      80-89 ⇒ B      70-79 ⇒ C      60-69 ⇒ D      0-59 ⇒ F

**Final Exam:** The final exam has been scheduled for Thursday, May 15, from 5:40-7:30pm. Students who have more than two exams on one day may reschedule one of their finals, but this must be done at least two weeks in advance of the beginning of final exams.

**Last day to drop with a W:** April 4, 2003

**Academic Honesty:** Dismissal from the University will be recommended for any act of cheating.

**Final Grade Reports:** The Department of Aerospace Engineering has established the policy that no faculty will disclose final course grades before the official notification by the University except by way of a stamped, self-addressed envelop.

**Incomplete Grade:** If an event or circumstance beyond the student's control (*documented* illnesses or extraordinary circumstances such as a serious accident, death in the immediate family, natural disaster, etc.) prevents the student from completing a major portion of the course requirements, a grade of *I, Incomplete*, may be given if the student is making satisfactory progress at that time. An Incomplete grade cannot be given to avoid an unwanted grade resulting from unsatisfactory performance.

**Tentative Assignment Schedule for AE 733-Advanced Mechanics of Materials**  
Spring 2003

Date	Reading Assignment	HW #	Problems due
1/21	Chap 1		
1/23	Chap 2		
1/28	Chap 3	1	1.1, 1.2, 1.8, 1.10, 1.12, 1.20
1/30	Chap 3		
2/4	Chap 4	2	
2/6	Chap 4		
2/11	Chap 4	3	
2/13	Chap 5		
2/18	Exam #1 (Chaps 1-4)		
2/20	Chap 5		
2/25	Chap 5	4	
2/27	Chap 5		
3/4	Chap 5	5	
3/6	Chap 5		
3/11	Chap 6	6	
3/13	Chap 6		
	SPRING BREAK 3/17 – 3/23		
3/25	Chap 6		
3/27	Chap 6		
4/1	Chap 6	7	
4/3	Chap 6		
4/8	Chap 6	8	
4/10	Chap 7		
4/15	Exam #2		
4/17	Chap 7		
4/22	Chap 7	9	
4/24	Chap 7		
4/29	Chap 7	10	
5/1	Chap 7		
5/6	Chap 7	11	
5/8	Chap 7		
5/15	Final Exam (5:40 – 7:30pm)		

Kazuka Ishikawa Zoo 3/1/28

**Tentative Assignment Schedule for AE 733-Advanced Mechanics of Materials**  
Spring 2003

Date	Reading Assignment	HW #	Problems due
1/21	Chap 1		
1/23	Chap 2		
1/28	Chap 3	1	1.1, 1.2, 1.8, 1.10, 1.12, 1.20
1/30	Chap 3		
2/4	Chap 4	2	2.1, 2.5, 2.11, 2.21, 2.30, 2.32, 2.43
2/6	Chap 4		
2/11	Chap 4	3	
2/13	Chap 5		
2/18	Exam #1 (Chaps 1-4)		
2/20	Chap 5		
2/25	Chap 5	4	
2/27	Chap 5		
3/4	Chap 5	5	
3/6	Chap 5		
3/11	Chap 6	6	
3/13	Chap 6		
	SPRING BREAK 3/17 - 3/23		
3/25	Chap 6		
3/27	Chap 6		
4/1	Chap 6	7	
4/3	Chap 6		
4/8	Chap 6	8	
4/10	Chap 7		
4/15	Exam #2		
4/17	Chap 7		
4/22	Chap 7	9	
4/24	Chap 7		
4/29	Chap 7	10	
5/1	Chap 7		
5/6	Chap 7	11	
5/8	Chap 7		
5/15	Final Exam (5:40 - 7:30pm)		

AE733 2003/2/11  
Kosuke Ishikawa

**Tentative Assignment Schedule for AE 733-Advanced Mechanics of Materials**

Spring 2003

Date	Reading Assignment	HW #	Problems due
1/21	1.0, 1.1, 1.2, 1.3, 1.4		
1/23	1.5, 2.0, 2.1.1, 2.1.2		
1/28	2.1.3, 2.1.4, 2.1.5	1	1.1, 1.2, 1.8, 1.10, 1.12, 1.20
1/30	2.1.6, 2.1.7, 2.2, 2.4		
2/4	2.5, 3.0, 3.1, 3.2	2	2.1, 2.5, 2.11, 2.21, 2.30, 2.32, 2.43
2/6	3.3, 3.4		
2/11	3.5, 3.4.4, 3.6, 3.8		
2/13	4.0, 4.1, 4.2.1, 4.2.3, 4.2.4		
2/18	4.2.3, 4.2.4	3	3.2, 3.5, 3.7, 3.24, 3.25
2/20	4.3		
2/25	Warping Function	4	3.35, 3.37, 3.41, 3.43, 3.45
2/27	Exam #1 (Chaps 1-4)		
3/4	Chap 5		
3/6	Chap 5		
3/11	Chap 6	5	
3/13	Chap 6		
	SPRING BREAK 3/17 - 3/23		
3/25	Chap 6		
3/27	Chap 6		
4/1	Chap 6	6	
4/3	Chap 6		
4/8	Chap 6	7	
4/10	Chap 7		
4/15	Exam #2	8	
4/17	Chap 7		
4/22	Chap 7	9	
4/24	Chap 7		
4/29	Chap 7	10	
5/1	Chap 7		
5/6	Chap 7	11	
5/8	Chap 7		
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# Tentative Assignment Schedule for AE 733-Advanced Mechanics of Materials

Spring 2003

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1/21	1.0, 1.1, 1.2, 1.3, 1.4		
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1/28	2.1.3, 2.1.4, 2.1.5	1	1.1, 1.2, 1.8, 1.10, 1.12, 1.20
1/30	2.1.6, 2.1.7, 2.2, 2.4		
2/4	2.5, 3.0, 3.1, 3.2	2	2.1, 2.5, 2.11, 2.21, 2.30, 2.32, 2.43
2/6	3.3, 3.4		
2/11	3.5, 3.4.4, 3.6, 3.8		
2/13	4.0, 4.1, 4.2.1, 4.2.3, 4.2.4		
2/18	4.2.3, 4.2.4	3	3.2, 3.5, 3.7, 3.24, 3.25
2/20	4.24		
2/25	4.3	4	3.35, 3.37, 3.41, 3.43, 3.45
2/27	Warping Function	5	TBD
3/4	Exam #1 (Chaps 1-4)		
3/6	Chap 5		
3/11	Chap 5	6	
3/13	Chap 6		
	SPRING BREAK 3/17 – 3/23		
3/25	Chap 6		
3/27	Chap 6		
4/1	Chap 6	7	
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4/17	Chap 7		
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2003/2/25

**Tentative Assignment Schedule for AE 733-Advanced Mechanics of Materials**  
Spring 2003

Date	Reading Assignment	HW #	Problems due
1/21	1.0, 1.1, 1.2, 1.3, 1.4		
1/23	1.5, 2.0, 2.1.1, 2.1.2		
1/28	2.1.3, 2.1.4, 2.1.5	1	1.1, 1.2, 1.8, 1.10, 1.12, 1.20
1/30	2.1.6, 2.1.7, 2.2, 2.4		
2/4	2.5, 3.0, 3.1, 3.2	2	2.1, 2.5, 2.11, 2.21, 2.30, 2.32, 2.43
2/6	3.3, 3.4		
2/11	3.5, 3.4.4, 3.6, 3.8		
2/13	4.0, 4.1, 4.2.1, 4.2.3, 4.2.4		
2/18	4.2.3, 4.2.4	3	3.2, 3.5, 3.7, 3.24, 3.25
2/20	4.2.4		
2/25	4.3	4	3.35, 3.37, 3.41, 3.43, 3.45
2/27	Warping Function	5	4.5, 4.7, 4.8, 4.15, 4.17, 4.19
3/4	Exam #1 (Chaps 1-4)		
3/6	Chap 5		
3/11	Chap 5	6	
3/13	Chap 6		
	SPRING BREAK 3/17 - 3/23		
3/25	Chap 6		
3/27	Chap 6		
4/1	Chap 6	7	
4/3	Chap 6		
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4/10	Chap 7		
4/15	Exam #2	9	
4/17	Chap 7		
4/22	Chap 7	10	
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