

CE 542 Theory of Plates and Shells (3)

2016 Spring Semester — **Tentative** Course Syllabus

Lecture	Tuesday	6:40p.m. to 9:20p.m.	OHE 100C
Professor	Dr. A. M. Niaz, P.E.		
Email	Niaz@usc.edu		
Textbook • Required	A. C. Ugural, “Stresses in Beams, Plates, and Shells,” 3rd edition,” CRC Press, 2009, ISBN-13: 978-1-4398-0270-0.		
References	<ol style="list-style-type: none"> 1. Reddy, J. N., “Theory and Analysis of Elastic Plates and Shells,” CRC, 2nd edition, December 2006. 2. R. Szilard., “Theory and Analysis of Plates,” Prentice Hall, 1974. 3. P.L. Gould, “Analysis of Shells and Plates,” Prentice Hall, 1999. 4. E.H. Mansfield “The Bending and Stretching of Plates,” 2nd edition, Cambridge University Press, 1989. 5. S. Timoshenko, and S. Woinowsky-Krieger “Theory of Plates and Shells,” McGraw-Hill, 1959. 6. W. Pilkey, “Stress, Strain, and Structural Matrices,” 1st edition, John Wiley & Sons, Inc., 1994. 7. W. Young & W. Budynas, “Roark’s Formulas for Stress and Strain,” 7th Edition, McGraw-Hill Inc., 2002. 		
Course Description	Theory of plate bending; rectangular and circular plates; energy methods; numerical methods; vibration of plates, stability of plates, introduction to shell theory, membrane and bending stresses, cylindrical shells.		
Course Objectives	To achieve fundamental understanding of the classical theory of elastic plates and shells, address limitations and differences, introduce nomenclature, and present analytical and numerical solution techniques.		
Learning Objectives	To enable students to apply the theory of plates and shells to problems, involving various geometries and boundary conditions, to diverse problems in civil, mechanical, aerospace engineering, and other related fields.		
Policies on:			
Exams	<ul style="list-style-type: none"> • Closed book. • Only one sheet of 8.5” x 11” paper (two pages) of formulae allowed. • Calculator. • Students must turn in questions sheets with their answer sheets at the end of each exam. 		
Homework	Homework problems , which are assigned weekly, are due on the following Tuesday, by 6:40 p.m. in Los Angeles, CA, USA; unless otherwise instructed .		
Late work	Not to be accepted.		
Make-up work	No make-up on any examinations.		
Incomplete work	To be graded accordingly.		
Extra credit	No extra Credit.		
Final grade scheme is based on total percentage of graded coursework	Homework:	20%	
	Midterm Exam:	35%	
	Final Exam:	45%	
	Total:	100%	

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Tentative Class Calendar

Week	Tuesday	Topic	Homework	
			Assignment	Due
1	1/12	Plates: Introduction/Fundamentals		
2	1/19	Plate-Bending Theory	HW 1	
3	1/26	Classical Solution Methods/Rectangular Plates	HW 2	HW 1
4	2/2	Rectangular Plates/Circular Plates	HW 3	HW 2
5	2/9	Circular Plates/Plates on Elastic Foundations	HW 4	HW 3
6	2/16	Analysis of Membranes/Bending & Stretching/Energy Methods/Ritz Method	HW 5	HW 4
7	2/23	Large Deflection, Stability: Fundamentals/Applications	HW 6	HW 5
8	3/1	Dynamics: Free Vibrations	HW 7	HW 6
9	3/8	Midterm Exam (120 minutes)		
10	3/15	Spring Recess: Monday, March 14 - Sunday, March 20.		
11	3/22	Anisotropic Plates		HW 7
12	3/29	Shells: Introduction/ Membrane Theory/ Membrane Stresses	HW 8	
13	4/5	Bending Theory/ Bending Stresses	HW 9	HW 8
14	4/12	Cylindrical Shells under General Loads/Buckling	HW 10	HW 9
15	4/19	Applications: Pipes, Tanks, Pressure Vessels	HW 11	HW 10
16	4/26	Plates & Shells: Numerical Methods		HW 11
17	5/3	Study Days: Saturday, April 30 – Tuesday, May 3.		
18	5/10	Final Exam (120 minutes)		

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STATEMENT ON ACADEMIC INTEGRITY

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own.

All students are expected to understand and abide by these principles. *SCampus*, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A:

<http://www.usc.edu/dept/publications/SCAMPUS/gov/>

Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at:

<http://www.usc.edu/student-affairs/SJACS/>

The Viterbi Honor Council presents the following honor code:

Engineering enables and empowers our ambitions and is integral to our identities. In the Viterbi community, accountability is reflected in all our endeavors.

Engineering + Integrity.
Engineering + Responsibility.
Engineering + Community.
Think good. Do better. Be great.

These are the pillars we stand upon as we address the challenges of society and enrich lives.

STATEMENT FOR STUDENTS WITH DISABILITIES

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible.

DSP Contact Information

Location: STU 301
Hours open: 8:30 a.m. until 5:00 p.m., Monday — Friday
Phone number: (213) 740-0776