

CE 518 - THEORY OF STRUCTURAL STABILITY
Spring 2004

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Office Hours: Friday 9:00 - 11:00am, and by Appointment

Class Meetings: Thursday, 6:30-9:00 PM, Tapy 220

Text: *Chajes, Alexander, "Principles of Structural Stability Theory", Prentice-Hall, 1974*
(Out of Print: Purchase Copy from Farris Engineering Copy Center).

<u>Session</u>	<u>Topic</u>	<u>Reading Assignment</u>
	<u>Column Buckling</u>	
1/22	Introduction; Column Buckling	1.1-1.6
	O.D.E. for Column Buckling	1.7-1.9
1/29	Initially Bent Columns; Eccentrically Loaded Columns	1.10-1.12
	Inelastic Buckling of Columns	1.13-1.16
2/5	More on Inelastic Column Buckling	1.17-1.21
	<u>Approximate Methods of Analysis</u>	
2/12	Energy Principles; Calculus of Variations	2.1-2.5
	Rayleigh Ritz Method	2.6-2.7
2/19	Galerkin's Method; Finite Differences	2.8-2.10
	Direct Stiffness Method	2.11-2.14
	<u>Beam Columns</u>	
2/26	Beam Column Examples	3.1-3.3
	Slope-Deflection Equation; Design	3.4-3.6
	<u>Buckling of Frames</u>	
3/4	Behavior, Critical Load Calculation	4.1-4.4
	Frame Buckling; Design Considerations	4.5-4.7
3/11	MID-TERM EXAM	
	<u>Torsional Buckling</u>	
3/25	Introduction; Strain Energy of Torsion	5.1-5.3
	Torsion and Torsional Flexural Buckling	5.4
4/1	More on Lateral Buckling	5.5-5.9
	<u>Plate Buckling</u>	
4/8	Introduction; Linear Theory	6.1-6.3
	Strain Energy of Bending; Example	6.4-6.5
4/15	Approximate Methods for Plate Buckling	6.6-6.8

Practical Plate Buckling Considerations

6.9-6.14

Buckling of Cylindrical Shells

4/22	General Introduction Axially compressed cylindrical shells	7.1-7.4
4/29	Other Topics and Review	
5/6	FINAL EXAM	

Homework assignments will be given on the order of approximately once every two weeks. The final grade will be determined from the results of the homework, mid-term examination, final exam, and classroom participation, using the following weights:

Homework	25%
Midterm Exam	30%
Final Exam	35%
Classroom Participation and Other Involvement	10%

Both exams will be in-class, with open books and open notes, with a time limit of 2.5 hours. There will be no make-up exams, but students can arrange to take an exam in advance of the scheduled date if they have travel conflicts.