

Fall 2019

CE 632-103: Design of Prestressed Concrete Structures

Raj Navalurkar

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CE 632 - Design of Prestressed Concrete Structures
Section: 103

Fall 2019

Text: Nawy, Edward G., Prestressed Concrete - Fundamental Approach, 5th Edition
Updated
Prentice Hall, 2009, ISBN: 0-13-6081509

Instructor: Dr. Raj Navalurkar, PE, Rajendra.navalurkar@parsons.com
CE 632 - Section 103 Tuesday 6 PM - 8:50 PM Room 310 Central King Building

Prerequisites: undergraduate course in theory and design of reinforced concrete. Analysis and design of pre-tensioned prestressed concrete elements for both determinate and indeterminate structures will be studied. Examples of prestressed elements used in buildings and bridges will be discussed, as well as the source and magnitude of prestress losses.

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Week	Topic	Homework
1	Introduction, Prestressing Methods, Prestressing Systems, General Design Principles. Chapter 1	To be assigned in class
2	Materials for Prestressing; Steel (strength, plasticity, relaxation, corrosion. Concrete strength, elastic modulus, and shrinkage and creep properties. Chapter 2	To be assigned in class
3,4	Prestress Losses, Effect of Friction, Relaxation, Creep and Shrinkage, Specifications and Practical Design Solutions. Chapter 3	To be assigned in class

Week	Topic	Homework
5,6	Basic Principles for Flexural Design; Service Load Design, Minimum Section Modules, Limiting Eccentricities, Shape and Size Selections, Practical Considerations. Chapter 4	To be assigned in class
7	End Anchorage and Bearing. Chapter 4	To be assigned in class
8	Mid-Term Exam	
9	Ultimate Strength Flexural Design. Chapter 4	
10	Shear (and Torsion) Design. Chapter 5	To be assigned in class
11	Camber, Deflections, and Crack Control - Serviceability. Chapter 7	To be assigned in class
12	Continuity in Prestressed Beams; Elastic Analysis, Load-Balancing Method. Chapter 6	To be assigned in class
13	Compression Members and Tension Members. Chapter 8	To be assigned in class
14	Introduction to Two-Way Prestressed Concrete Floor Systems. Chapter 9	To be assigned in class
15	Final Exam	

Grading

1. Homework/Project	-----	30% (must do all homework)
2. Term Exam	-----	35%
3. Final Exam	-----	<u>35%</u>
		100%