

CE-854 Stability of Structures

Code	Credit Hours	Category
CE-854	3 Credit Hours	Elective

Course Description:

This course covers the principles of structural stability, focusing on the analysis and design of stable structures. Topics include buckling of columns, stability of frames, and the application of stability principles in the design of buildings and other structures.

Text Book:

Timoshenko, S. P., and Gere, J. M. (1961), "Theory of Elastic Stability," McGraw-Hill.

Reference Books:

B. B. Boley and J. H. Weiner (1960), "Theory of Thermal Stresses," Wiley.

Z. P. Bazant and L. Cedolin (1991), "Stability of Structures: Elastic, Inelastic, Fracture, and Damage Theories," Oxford University Press.

Prerequisites:

BE (Civil, Architecture, Construction Engineering & Management).

Assessment System

Component	Weightage	Frequency
Quizzes	10-15%	2-3
Assignments	10-20%	2-3
Mid Terms	30-35%	1
ESE	40-50%	1
Project (optional)	10-15%	1

Teaching Plan:

Week No	Topic	Learning Outcomes
1	Introduction to Structural Stability	Understand the fundamental principles of structural stability.
2	Buckling of Columns	Analyze the buckling behavior of columns.

3	Single degree of freedom systems	Buckling, snap-through, bifurcations and imperfection sensitivity
4-5	Lateral-Torsional Buckling of Beams	Evaluate the lateral-torsional buckling of beams.
6	Stability of Frames and Trusses	Assess the stability of frames and trusses.
7-8	Post-Buckling Behavior	Predict post-buckling behavior of structures.
9	Mid Term Exam/ OHT, (As per NUST Exam Policy)	
10-11	Instabilities in Plated Structures	
12	Multi degree of freedom systems	Diagonalized systems, Introduction to mode interaction
13-15	Design Applications and Case Studies	Apply stability principles in design applications and case studies.
16	Instabilities in Frames	
17	Instabilities in Beams	
18	ESE	