Jordan University of Science and Technology

Faculty of Engineering

Civil Engineering Department

CE734 Structural Stability - JNQF Level: 9
First Semester 2024-2025

Course Catalog
3 Credit Hours. Calculations of the critical loads of mechanical system, columns, beams, and plates; Calculations of the critical loads of columns using energy method, Stability of beams, trusses and frames using stiffness method.
Teaching Method: Blended

Text Book	
Title	Fundamentals of Structural Stability
Author(s)	George J. Simitses, George Simitses, Dewey H Hodges
Edition	1st Edition
Short Name	Ref # 1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref # 2	Stability of Structures: Principles and Applications	Chai H Yoo and Sung Chil Lee	1st Edition	

Instructor	
Name	**Prof. Yousef Al Rjoub**
Office Location	-
Office Hours	Sun : 12:30 - 13:30 Sun : 14:30 - 15:30 Mon : 13:30 - 14:30 Tue : 13:30 - 15:30 Wed : 13:30 - 14:30
Email	ysalrjoub@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Mon : 14:30 - 16:30 Room: C2010

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2, 3	Basic Concepts of Stability: Branching Points, Imperfection Sensitivity, and Limit Points.	
Weeks 4, 5	Elastic Buckling of Columns: Standard and additional Cases	
Weeks 6, 7, 8	Elastic Buckling of Frames: Beam-Column Theory and Elasica Problem.	
Weeks 9, 10	Energy Based Methods: Approximation Variational Methods.	
Weeks 11, 12	Matrix Method for Stability Analysis: Beams, Trusses, and Frames	
Weeks 14, 15	Bucking of Thin Rectangular Plates.	

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Students be able to calculate the critical buckling loads of mechanical system [1L9S2]	20%	
Students be able to analyze the buckling of standard columns [1L9K1]	20%	
Students be able to analyze the buckling of frames [1L9K1]	20%	
Apply energy method to calculate the buckling loads of columns [1L9K1]	10%	
Apply stiffness method to calculate the buckling loads of beams, trusses, and frames [1L9S2]	10%	
Students be able to calculate the buckling loads of plates [1L9S2]	20%	

Relationship to Program Student Outcomes (Out of 100%)											
PI-1a	PI-2a	PI-2b	PI-2c	PI-2d	PI-3a	PI-4a	PI-4b	PI-5a	PI-6a	PI-6b	PI-7a

Relationship to NQF Outcomes (Out of 100%)	
L9K1	L9S2
50	50

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