Jordan University of Science and Technology

Faculty of Engineering

Civil Engineering Department

CE736 Advanced Structural Mechanics
First Semester 2024-2025

Course Catalog
3 Credit Hours. The objective of this course is to learn how to formulate problems and how to reduce vague questions and ideas to precise mathematical statements. In this course we deal with the fundamental principles that underlie such differential equations and boundary conditions and to participate in solving some of these equations. Mechanics of Materials is a subset of Continuum Mechanics and Mechanics of Deformable Solids bridging the gap between Structural Mechanics and Engineering Material Science. Mechanics of Materials rationalizes approximate solutions which are the basic design formulas in Structural Engineering and relates them to analysis solutions from the Theory of Elasticity and Theory of Plasticity. The objectives of Mechanics of Materials can be summarized as the analysis and design of solids and structures according to strength, stiffness, and stability.
Teaching Method: On Campus

Text Book	
Title	Advanced Mechanics of Materials
Author(s)	P. Boresi, R.J. Schmidth and O. M. Sidebottom
Edition	5th Edition
Short Name	Reference #1
Other Information	John Wiley & Sons Inc., USA.

Course References

Short name	Book name	Author(s)	Edition	Other Information
Reference #2	Mechanics of composite materials	R. M. Jones	5th Edition	McGraw-Hill, last edition

Instructor	
Name	**Prof. Ghazi Abu-Farsakh**
Office Location	C2 L3

Office Hours	Mon : 11:30 - 13:00 Mon : 14:30 - 16:00 Tue : 13:00 - 14:00 Wed : 11:30 - 13:00 Wed : 14:30 - 16:00 Thu : 12:00 - 13:00
Email	ghazi@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Mon, Wed : 13:00 - 14:30 Room: C2008

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2, 3	PRELIMINARIES: NOTATION, MATRIX, VECTOR AND TENSOR ANALYSIS	
Weeks 4, 5	ANAL YSIS OF STRESS- STATIC CONCEPTS	From **Reference #1**
Weeks 6, 7	ANALYSIS OF STRAIN- GEOMETRIC CONCEPTS	From **Reference #1**
Weeks 8, 9	CONSTITUTIVE RELATIONS- MATERIAL DESCRIPTIONS	From **Reference #1**
Weeks 10, 11	5. FLEXURAL THEORY	From **Reference #1**
Weeks 12, 13	2D- PROBLEMS IN ELASTICITY	From **Reference #1**
Weeks 14, 15	MECHANICS OF COMPOSITE MATERIALS	From **Reference #2**
Week 16	Seminars	

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
To be able to express and employ various notations: matrix, vector and tensor formulations in problem analysis	10%	
To be able to analyze stress-static concepts	20%	
To be able to analyze strain-geometric concepts	20%	
To be able to construct constitutive relations of the material in order to express and describe its' behavior	20%	
To be able to formulate and compose total strain energy and its components	10%	

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

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