Jordan University of Science and Technology

Faculty of Engineering

Aeronautical Engineering Department

AE214 Strength Of Materials - JNQF Level: 7
Second Semester 2023-2024

Course Catalog
3 Credit Hours. Concepts of stress and strain, Stresses and displacements of axially loaded members, The state of stress and strain, Normal, bending, shear, and torsion stresses, Mechanical properties of materials, combined stresses, composite sections, Deflections: integration Method, Moment area method, Buckling of columns
Teaching Method: On Campus

Text Book	
Title	Mechanics of Materials
Author(s)	F.P. Beer, E.R. Johnston, Jr., and J.T. DeWolf, D.F. Mazurek
Edition	7th Edition
Short Name	Textbook
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref #1	Mechanics of Materials, R.C. Hibbeler, 9th edition.	R.C. Hibbeler	9th Edition	

Instructor	
Name	**Dr. ABDALLAH ALMOMANI**
Office Location	N1- L2
Office Hours	Sun : 11:30 - 13:00 Mon : 08:30 - 10:00 Tue : 11:30 - 13:00 Thu : 11:30 - 13:00
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Class Schedule & Room
Section 1: Lecture Time: Sun, Tue, Thu : 09:30 - 10:30 Room: E2010

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
252112	ME211B Statics	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2	Concept of stress and strain-Axial loading	**Chapter 1 , Chapter 2** From **Textbook**
Weeks 3, 4	Torsion	**Chapter 3** From **Textbook**
Weeks 5, 6	Pure bending	**Chapter 4** From **Textbook**
Weeks 7, 8	Analysis and design of beams for bending	**Chapter 5** From **Textbook**
Weeks 9, 10	Shearing stresses in beams and thin-walled members	**Chapter 6** From **Textbook**
Weeks 11, 12	Transformations of stress and strain	**Chapter 7** From **Textbook**
Weeks 13, 14	Deflection of beams	**Chapter 9** From **Textbook**
Weeks 15, 16	Buckling	**Chapter 10** From **Textbook**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Apply stress and strain analysis principles to calculate stresses, strains, and deformations in loaded structures and machine components subjected to normal, shear, torsional, and bending loads, considering stress concentration factors and temperature effects, to gain practical skills for assessing loaded structures. [1SO1] [1L7K1]	40%	
Utilize deformation and deflection principles to solve statistically indeterminate problems of members subjected to various loadings to enhance problem-solving capabilities in engineering scenarios and foster critical thinking in structural analysis. [1SO2] [1L7S1]	7%	
Evaluate materials in one, two, and three dimensions, utilizing Hook's Law and understanding material behavior concepts to acquire better knowledge of material deformation in 3 dimensions. [1SO2] [1L7S1]	8%	
Solve problems using stress transformation equations and Mohrs circle to analyze stress states, calculate principal stresses, and predict material failure under various loading conditions to enhance precision in stress analysis and material failure prediction. [1SO1] [1L7K1]	25%	

Examine beam deflection behaviors in structures subjected to vertical loading using double integration and superposition and determine the structural stability of columns under compression loading, gaining crucial insights for designing robust and stable structures, ensuring structural integrity and safety. [1SO2] [1L7S1]	20%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
65	35					

Relationship to NQF Outcomes (Out of 100%)	
L7K1	L7S1
65	35

Evaluation	
Assessment Tool	**Weight**
First Exam	30%
Second Exam	30%
Final Exam	40%

Policy	
Attendance	The student is required to attend all the registered courses. The instructor shall register student attendance or absence electronically. JUST policy requires the faculty member to assign ZERO grade (35) if a student misses 20% of the classes. If you miss a class, it is your responsibility to find out about any announcements or assignments you may have missed.
Exam/Homework	Makeup exam should not be given unless there is a valid excuse according to JUST policies. Arrangements to take an exam at a time other than the one scheduled MUST be made prior to the scheduled exam time. Cheating or copying from neighbor on exam, quiz, or homework is an illegal and unethical activity. Standard JUST policy will be applied. All assignments must be your own work (your own words) Students are responsible for all information provided in lecture. Information presented in class supersedes any information posted elsewhere.

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