JORDAN UNIVERSITY OF SCIENCE AND TECHNOLOGY
INDUSTRIAL ENGINEERING DEPARTMENT

Course Number and Name	IE 211 Mechanics of Materials
Course Description	The course covers force vectors, equilibrium of force systems, rigid body equilibrium, internal forces, and stress and strain. The course also covers generalized Hook's law, axial loading, torsion of circular shafts, bending and shear of beams, and combined loadings
Credits and contact hours	3 Credit hours; 3 hours of lectures
Pre- or Co-requisites	PHY101 General Physics (1)
Required/ Elective	Required

Text Book(s)	R. C. Hibbeler. *Statics and Mechanics of Materials*. Pearson Prentice Hall, latest edition
References	**1**- H.W. Morrow, and R.P. Kokernak, "Statics and Strength of Materials", 7th Edition, Pearson Prentice Hall, 2010 **2**- F.P. Beer, E.R. Johnson, J.T. DeWolf, and D. Mazurek, "Mechanics of Materials", 6th Edition, McGraw-Hill, 2011 **3**- J.M. Gere and B. Goodno, "Mechanics of Materials", 8th Edition, Cengage Learning, 2012

Course Objectives	• To learn the various analysis techniques applicable to the mechanics of materials field. • To develop the skills to recognize and to solve stress-related problems..
Measured Outcomes	ABET 3a: Apply knowledge of mathematics, science, and engineering principles in solving industrial problems.

Evaluation	
Assessment Tool	**Grade Percentage**
First Exam	20 %
Second Exam	20%
Exercises and Quizzes	10%
Class Participation	10 %
Final Exam	40 %

Chapter	Title	Topics	Sections	Exercises
4	Equilibrium of a Rigid Body	• Free-body diagrams • Equations of equilibrium • Two-force members	1-4	Exercises.pdf
5	Structural Analysis	• Simple trusses • The method of joints • Zero-force members	1-3	Exercises.pdf
6	Geometric Properties and Distributed Loadings	• Centroids • Moment of area • Resultant of distributed loads	1-8	Exercises.pdf
First Exam				
7	Internal Loadings	• Internal loadings • Shear and moment diagrams	1-3	Exercises.pdf
8	Stress and Strain	• Normal stress • Shear stress • Average stress • Allowable stress • Normal strain • Shear strain	1-8	Exercises.pdf
9	Mechanical Properties and Testing	• Review	NA	NA
10	Axial Load	• Axial deformation • Statically indeterminate members • Thermal strain	1-5	Exercises.pdf
Second Exam				
11	Torsion	• Torsion formula • Angle of twist • Statically indeterminate members	1-5	Exercises.pdf
12	Bending	• Flexure formula	1-2	Exercises.pdf
15	Stress and Strain Transformation	• Stress transformations in 2D	1-4	Exercises.pdf
16	Design of Beams	• Integration method • Superposition method	4-6	Exercises.pdf
Final Exam				