COURSE PLAN

FIRST: BASIC INFORMATION

College	
College	: Faculty of Karak - Balqa Applied University
Department	: Mechanical Engineering

Course	
Course Title	: Introduction to Basic Engineering
Course Code	: 020209111
Credit Hours	: 2 (2 Theoretical, 0 Practical)
Prerequisite	:

Instructor	
Name	: Dr. Jamil Haddad
Office No.	: 2
Tel (Ext)	:
E-mail	: drjamil@bau.edu.jo
Office Hours	:

Class Times	The building	today	Start time	End time	Hall number

Text Book	
Title	: Beer, Johnston, Dewolf "Mechanics of Material" 6th edition

References
1. Engineering Fundamentals: an introduction to engineering (Saeed Moaveni)

SECOND: PROFESSIONAL INFORMATION

COURSE DESCRIPTION

This course deals with the behavior of materials at stresses below and above elastic limit and materials properties, conduct tensile and compressive strength tests, properties of sections, shearing forces and bending moments with sign conventions, calculate moments, flexural and shear stresses, principles of deflection, and the effect of torsion on circular section.

COURSE OBJECTIVES

The objectives of this course are to enable the student to do the following :
- Explain the principles of mechanics applied to the structures of beams and materials around us.
- Develop problem solving skills through application of these principles to basic mechanical engineering problems.
- Explain the relationship between the shearing force and bending moment, and compute stresses and strains by Mohr's circles including the concept of principal stresses.

COURSE LEARNING OUTCOMES

On successful completion of this course, students are expected to be able to:

CLO1. Explain the difference between the following terms: tensile and compressive stresses, tensile and compressive strains, modulus of elasticity

CLO2. Compute torsion induced stress circular shafts, angel of twist, statically indeterminate

CLO3. Define and calculate the first and second moments of area

CLO4. Compute bending and shear stress in beams

CLO5. Explain the relationship between the shearing force and bending moment

CLO6. Compute stresses and strains by Mohr's circles including the concept of principal stresses

COURSE SYLLABUS

Week	Unit	Content	Related L.O. and reference (Chapter)	Proposed assignments
1	Introduction—Concept of Stress	• Normal stress • Shearing stress connections of stress • Factor of safety	CLO1	
2	Stress and Strain—Axial Loading	• Stress strain diagram • Hooke's law and deformations • Statically indeterminate problems	CLO1	
3	Stress and Strain—Multi-axial Loading	• Thermal effect • Poisson's ratio • Multi-axial loading • Shearing strain	CLO1	
4	Torsion	• Torsion induced stress circular shafts	CLO2	
5	Torsion	• Angle of twist • Statically indeterminate	CLO2	
6	Moments of Areas	• First moments of area	CLO3	
7	Moments of Areas	• Second moments of area	CLO3	
8	**Midterm Exam**			
9	Pure Bending	• Symmetric member in pure bending • Deformations in a symmetric member in pure bending • Stresses and deformations in the elastic range	CLO4	
10	Pure Bending	• Deformations in a transverse • Cross section bending of members made of several materials	CLO4	
11	Analysis and Design of Beams for Bending	• Shear and bending moment diagrams	CLO5	

Week	Unit	Content	Related L.O. and reference (Chapter)	Proposed assignments
12	Analysis and Design of Beams for Bending	• Relations among load • Design of beams for bending	CLO5	
13	Transformations of Stress and Strain	• Transformation of plane stress • Plane stress and plane strain	CLO6	
14	Transformations of Stress and Strain	• Principle stresses, maximum shearing stress	CLO6	
15	Mohr' circle	• Drawing Mohr's circle • Calculate the stress and strain using Mohr's circle	CLO6	
16		**Final Exam**		

COURSE LEARNING RESOURCES

The effectiveness of teaching in this course depends on making students familiar with behavior of materials at stresses below and above elastic limit and materials properties, conduct tensile and compressive strength tests, properties of sections, shearing forces and bending moments with sign conventions, calculate moments, flexural and shear stresses, principles of deflection, and the effect of torsion on circular section

Teaching methods:
- Problem-solving skills: through application of these principles to basic engineering problems.
- Online research skills on topics related to course objectives and recent developments in the field of mechanical engineering (welding and plumbing).
- Learning skills and adaptability: Developed by transferring students and reconfiguring work teams to enable them to adapt to other individuals from time to time.

ONLINE RESOURCES

1)   https://www.vitalsource.com/

ASSESSMANT TOOLS

Assessment Tools	%
Projects and Quizzes	20%
MID Exam	30%
Final Exam	50%
Total Marks	100%

THIRD: COURSE RULES

ATTENDANCE RULES

Attendance and participation are extremely important, and the usual University rules will apply. Attendance will be recorded for each class. Absence of 10% will result in a first written warning.

Absence of 15% of the course will result in a second warning. Absence of 20% or more will result in forfeiting the course and the student will not be permitted to attend the final examination. Should a student encounter any special circumstances (i.e. medical or personal), he/she is encouraged to discuss this with the instructor and written proof will be required to delete any absences from his/her attendance records.

GRADING SYSTEM
Example:

Course Marks Average		
Average	**Maximum**	**Minimum**
Excellent	100%	90%
Very Good	89%	80%
Good	79%	70%
Satisfactory	69%	60%
Weak	59%	50%
Failed	49%	35%

REMARKS

{The instructor can add any comments and directives such as the attendance policy and topics related to ethics}

COURSE COORDINATOR

Course Coordinator	**Department Head:**
Signature:	**Signature:**
Date:	**Date:**