جامعة الشرقية
A' SHARQIYAH UNIVERSITY

Course Descriptor

CVEN 333 – Mechanics of Materials

ACADEMIC YEAR	2020-2021	**SEMESTER**	Spring
Course Code	CVEN 333	**Course Title**	Mechanics of Materials
Credit hours	3	**Level of study**	Undergraduate
College / Centre	College of Engineering	**Department**	CVEN
Co-requisites	--	**Pre-requisites**	ENGR220

1. COURSE OUTLINE

Two-dimensional stresses and strains and deflections of statically-determinate members subjected to axial, torsional and transverse loads. Buckling of columns. Mohr circle and stress transformation.

2. AIMS

This course is one in a sequence of mechanics (engineering science) courses that form a foundational component of the engineering curriculum.

3. LEARNING OUTCOMES, TEACHING, LEARNING and ASSESSMENT METHODS

Learning Outcomes (Definitive)	Teaching and Learning methods (Indicative)	Assessment (Indicative)
1. Apply knowledge of mathematics and science	Lecturers, Presentations	*Class Tests, Assignments and Final Examination*
2. Gain a clear understanding of the basic principles of mechanics	Lecturers, Presentations	*Class Tests, Assignments and Final Examination*
3. Acquire the ability to apply the principles of mechanics to solve a wide range of engineering problems	Lecturers, Presentations	*Class Tests, Assignments and Final Examination*
4. Have an expanded understanding of mechanical properties of solid materials through hands-on experiences and personal observation	Lectures, Presentation	*Class Tests, Assignments and Final Examination*
5. Improve skills in data collection, evaluation and reporting results of laboratory experiments	Lectures, Presentation	*Class Tests, Assignments and Final Examination*
6. Work in groups but will keep individual lab notebooks and submit formal group reports, which summarize the experiments	Lectures, Presentation	*Class Tests, Assignments and Final Examination*

7. Design a specific experiment, conduct the experiment, collect data, evaluate the results and present a written report. The project must investigate fundamental principles of mechanics of solids.	Lectures, Presentation	*Class Tests, Assignments and Final Examination*

4. ASSESSMENT WEIGHTING

Assessment	Percentage of final mark (%)	Exam Dates
Laboratory Assignments	40	
Mid-term Examinations	1 x 20 = 20	
Final Examination	40	University Schedule
TOTAL	**100%**	

5. ACHIEVING A PASS

Students will achieve **03** credit hours for this course by passing **ALL** of the course assessments *[alternatively, list the compulsory pass assessments*]* and achieving a **minimum overall score of 50%**

NB *Ensure that ALL learning outcomes are taken into account

6. COURSE CONTENT (Indicative)

WEEK	LECTURE TOPIC	TIME (HOURS)
1	Equilibrium of deformable bodies	5 hours
2	The concepts of stress, deformation, and strain Experiment 1: **Deformation of Straight Beam Apparatus (WP950)** Deformations of statically determinate and indeterminate systems placed under load by different weights	5 hours
3	Hooke's Law Experiment 2: **Universal Material Tester (WP300)** Experiments demonstrating Stress, Strain, and Hooke's Law using Steel, Aluminum, Brass and Copper specimens.	5 hours
4	(Midterm I) Axially loaded members Experiment 3: **Reaction of Beams Apparatus (HFC1)** Simply supported beams Simply supported beam with overhangs Cantilever beam	5 hours

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5	Torsion Experiment 4: **Torsion of Circular Section Apparatus (STR6)** Torsion and Angle of Twist	
6	Shear and moment diagrams Experiment 5: **Shear Force and Bending Moment Apparatus (HFC31)** Shear forces and Bending Moments at cut sections	5 hours
7	Shear stresses in transversely loaded members	5 hours
8	Combined loadings, Mohr's circle	5 hours
9	Beam deflections **Experiment 6: Beam Deflection Unit Apparatus** Bending of a metal beam under various ladings and support conditions Others: **1. Laboratory Safety** **Digital Data collection techniques** (Equipment: **HDA200** Interface)	5 hours
	TOTAL HOURS	**45**
1 - 9	Plus **RECOMMENDED INDEPENDENT STUDY HOURS**	**90**
	TOTAL COURSE HOURS	**135**

7. RECOMMENDED READING

Core text/s:

Hibbeler, R.C. *Mechanics of Materials*, 9th Ed
Pearson

MECHANICS OF MATERIALS, SEVENTH EDITION
Published by McGraw-Hill Education,

Library + online resources: https://www.pdfdrive.com/r-c-hibbeler-8th-edition-book-d200733520.html