National University of Sciences & Technology (NUST)
School of Electrical Engineering and Computer Science (SEECS)
Department of Electrical Engineering

Engineering Mechanics			
Course Code:	ME-100	**Semester:**	Spring 2021
Credit Hours:	3	**Prerequisite Codes:**	
Instructor:	Dr. Hina Gohar Ali	**Discipline:**	Electrical Engineering
Office:	IAEC building	**Telephone:**	----------
Lecture:	Monday, Wednesday, Thursday	**E-mail:**	Hina.gohar@seecs.edu.pk
Class Room:	CR-13-SEECS/CR-14-SEECS	**Consulting Hours:**	Appointment through emails
Knowledge Group:	EPC	**Updates on LMS:**	Once or twice per week

Course Description:

This course will focus on the theory and application of engineering mechanics. Students will be introduced to the understanding of basic forces, free body diagrams, vectors, resultants, equilibrium, pulley systems, rigid bodies, truss analysis, frame, machine, internal forces in structural members, friction, center of gravity and centroids, moment of inertia, and composite bodies and areas.

Course Objectives:

- COMPREHEND concepts of vectors and scalars, forces, moments and couples.
- APPLY the learned concepts of forces, moments and couples to solve problems of equilibrium in 2-D and 3-D.
- ANALYZE structures such as plain trusses, frames and machines for reaction forces.
- APPLY the concepts of mechanics to solve problems of friction.

Books:

Text Books: 1. *RC Hibbeler, Engineering Mechanics (Statics and Dynamics), 14th Edition, Prentice Hall*
2. J L Meriam, L G Kraig, Engineering Mechanics (Statics): John Wiley & Sons Inc.

Reference Books: *3. Beer & Johnston, Vector Mechanics for Engineers: Statics & Dynamics, McGraw Hill*
4. Anthony M Bedford, Wallace Fowler. Engineering Mechanics (Statics), Prentice Hall
5. E. Nelson, Engineering Mechanics: Statics, Schaum's outline series New York.

Main Topics to be Covered:

1. General Principles
2. Force Vectors
3. Equilibrium of a Particle
4. Force System Resultants
5. Equilibrium of a Rigid Body
6. Friction
7. Kinematics of Particles
8. Kinetics of a Particle-Force and Acceleration

Course Learning Outcomes (CLO)

	Upon successful completion of this course the students will be able to demonstrate the following: -	PLO	BT LEVEL*
1	COMPREHEND concepts of vectors and scalars, forces, moments and couples.	1	C-2
2	APPLY the learned concepts of forces, moments and couples to solve problems of equilibrium in 2-D and 3-D.	2	C-3
3	ANALYZE structures such as plain trusses, frames and machines for reaction forces.	2	C-4
4	APPLY the concepts of mechanics to solve problems of friction.	2	C-3
* BT=Bloom's Taxonomy, C=Cognitive domain, P=Psychomotor domain, A=Affective domain			

Assessment and Weight ages

Quizzes: (5%)
Assignments & Class performance/behaviour, Class participation, Team work: (15%)
Mid Term: (30%)
ESE: (50%)
Total: 100%

COURSE BREAKDOWN (tentative)

No.	TOPICS
1	Introduction to General Principles and Fundamental Concepts
2	Force Vectors: Vector Operations, Addition of a system of Coplanar Forces, Addition and Subtraction of Cartesian Vectors, Position Vectors, Force vector directed along a line, Dot Product
3	Equilibrium of a Particle: Conditions for the equilibrium of a Particle, Free Body Diagram, Coplanar Force Systems, Three Dimensional Force Systems
4	Force System Resultants: Moment of a Force Scalar and Vector Formulation, Cross Product, principles of Moments, Moment of a Force about a specified Axis and Moment of a Couple, Equivalent System, Resultant of a Force and Couple System
5	Equilibrium of a Rigid Body: Conditions of Rigid Body Equilibrium, Equilibrium in Two Dimensional, Free Body Diagrams, Equations of Equilibrium, Two and Three Force members, Constraints for a Rigid Body
MID TERM (WEEK 8)	
6	Friction: Characteristic of dry friction, Problems involving dry friction, Wedges
7	Kinematics of Particles: Rectilinear Kinematics, General Curvilinear Motion, Rectangular Components, and Motion of a Projectile, Curvilinear Motion: cylindrical, normal and tangential components
8	Kinetics of a Particle-Force and Acceleration: Newton's laws of motion, Equation of motion for a system of particles, Equation of motion in rectangular, cylindrical and tangential coordinates, Central-Force Motion and Space Mechanics
ESE (WEEK 16)	

Grading Policy:	
Quiz Policy:	The quizzes will be unannounced and normally last for ten minutes. The question framed is to test the concepts involved in last few lectures. Number of quizzes that will be used for evaluation is at the instructor's discretion.
Assignment Policy:	In order to develop comprehensive understanding of the subject, assignments will be given. Late assignments will not be accepted / graded. All assignments will count towards the total (No 'best-of' policy). The students are advised to do the assignment themselves. Copying of assignments is highly discouraged and violations will be dealt with severely by referring any occurrences to the disciplinary committee. The questions in the assignment are meant to be challenging to give students confidence and extensive knowledge about the subject matter and enable them to prepare for the exams.
Plagiarism:	SEECS maintains a zero tolerance policy towards plagiarism. While collaboration in this course is highly encouraged, you must ensure that you do not claim other people's work/ ideas as your own. Plagiarism occurs when the words, ideas, assertions, theories, figures, images, programming codes of others are presented as your own work. You must cite and acknowledge all sources of information in your assignments. Failing to comply with the SEECS plagiarism policy will lead to strict penalties including zero marks in assignments and referral to the academic coordination office for disciplinary action.
Discussions:	LMS.SEECS.EDU.PK