



**DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
MECHANICAL ENGINEERING PROGRAM, BSC.**

Course Syllabus

1. Course number and name
ME 227 Applied Mechanics

2. Credits and contact hours
(3+0) 3 credit hours, 3 contact hours

3. Course type
Blended Learning Course (2+1)

4. Instructor's or course coordinator's name
Dr. Riyadh abu Mallouh

5. Textbook information

R Russell C. Hibbeler, **Engineering Mechanics: Statics & Dynamics**
, 14th, 2016 **ISBN-13** :9780133915426

1. Other supplemental materials
Hibbeler R. , Mechanics of Materials, 10th edition, 2016.
ISBN-13: 978-0134319650

6. Specific course information

1. Catalog description
Force and moment. Force system resultant. Equilibrium of rigid bodies.
Internal forces. Friction. Center of gravity and centroid. Moments of
inertia. Stress and strain. Kinematics of rigid bodies.

2. Prerequisites or co-requisites
Prerequisite: Phys 220 General Physics II

3. The course is:
Required in Industrial Engineering Department

7. Specific goals for the course

1. Course outcomes:
After completion of the course, students are expected to be able to:

1. Calculate the force System Resultants.
2. Analyze equilibrium of a Rigid Body.
3. Identify stress and strain.
4. Solve kinematics of particles problems.



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2. The following student outcomes are addressed by the course:

SO-(a) An ability to apply knowledge of mathematics, science, and engineering

SO-(e) An ability to identify, formulate, and solve engineering problems

1. Learning Outcomes and their Alignment with Program Educational Objective (PEO's), Methods of Delivery, and Assessment Methods:

Learning Outcomes	Program PEOs	Method of Delivery	Assessment Method
Course Outcomes			
CO-(1): Calculate the force System Resultants.	-	Lectures (Example and Problems)	First Exam
CO-(2): Analyze equilibrium of a Rigid Body.	-	Lectures (Example and Problems)	First Exam
CO-(3): Identify stress and strain	-	Lectures (Example and Problems)	Second Exam
CO-(4): Solve kinematics of particles problems	-	Lectures (Example and Problems)	Second Exam
Student Outcomes			
SO-(a) An ability to apply knowledge of mathematics, science, and engineering.	2	Lectures (Example and Problems)	First Exam
SO-(e) An ability to identify, formulate, and solve engineering problems.	1, 3	Lectures (Example and Problems)	Second Exam



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2. Weekly Teaching Plan

Week No.	Lecture	Topic	Method of Delivery
1	Sun (9-10)	Chapter 5: Equilibrium of a Rigid Body: Conditions for Rigid-Body Equilibrium	Lecture
	Tue (9-10)	Chapter 5: Equilibrium of a Rigid Body: Free-Body Diagrams	Lecture
	Thu (9-10)	Chapter 5: Equilibrium of a Rigid Body: Two- and Three-Force Members	Lecture
2	Sun (9-10)	Chapter 7: Internal Forces: Internal Loadings Developed in Structural Members	Lecture
	Tue (9-10)	Chapter 7: Internal Forces: Shear and Moment Equations and Diagrams	Lecture
	Thu (9-10)	Chapter 7: Internal Forces: Relations between Distributed Load, Shear, and Moment	Lecture
3	Sun (9-10)	Chapter 9: Center of Gravity and Centroid: Center of Gravity, Center of Mass, and the Centroid of a Body	Lecture
	Tue (9-10)	Chapter 9: Center of Gravity and Centroid: Composite Bodies	Lecture
	Thu (9-10)	Chapter 9: Center of Gravity and Centroid: Theorems of Pappus and Guldinus	Lecture
4	Sun (9-10)	Chapter 10: Moments of Inertia: Definition of Moments of Inertia for Areas	Lecture
	Tue (9-10)	Chapter 10: Moments of Inertia: Parallel-Axis Theorem for an Area	Lecture
	Thu (9-10)	Chapter 10: Moments of Inertia: Radius of Gyration of an Area	Lecture
5	Sun (9-10)	Chapter 1: Stress: Equilibrium of a Deformable Body	Lecture
	Tue (9-10)	Chapter 12: Kinematics of a Particle: Rectilinear Kinematics: Continuous Motion	Lecture
	Thu (9-10)	FIRST EXAM	Lecture
6	Sun (9-10)	Chapter 1: Stress: Stress	Lecture
	Tue (9-10)	Chapter 12: Kinematics of a Particle: Rectilinear Kinematics: Erratic Motion	Lecture
	Thu	Chapter 1: Stress: Average Normal Stress in an Axially Loaded Bar	Lecture



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	(9-10)		
7	Sun (9-10)	Chapter 12: Kinematics of a Particle: General Curvilinear Motion	Lecture
	Tue (9-10)	Chapter 1: Stress: Average Shear Stress	Lecture
	Thu (9-10)	Chapter 12: Kinematics of a Particle: Curvilinear Motion: Rectangular Components	Lecture
8	Sun (9-10)	Chapter 1: Stress: Allowable Stress Design	Lecture
	Tue (9-10)	Chapter 12: Kinematics of a Particle: Motion of a Projectile	Lecture
	Thu (9-10)	Chapter 2: Strain: Deformation	Lecture
9	Sun (9-10)	Chapter 12: Kinematics of a Particle: Curvilinear Motion: Normal and Tangential Components	Lecture
	Tue (9-10)	Chapter 2: Strain: Strain	Lecture
	Thu (9-10)	Chapter 12: Kinematics of a Particle: Curvilinear Motion: Cylindrical Components	Lecture
10	Sun (9-10)	Chapter 3: Mechanical Properties of Materials: The Tension and Compression Test	Lecture
	Tue (9-10)	Chapter 12: Kinematics of a Particle: Absolute Dependent Motion Analysis of Two Particles	Lecture
	Thu (9-10)	Chapter 3: Mechanical Properties of Materials: The Stress–Strain Diagram	Lecture
11	Sun (9-10)	Chapter 12: Kinematics of a Particle: Relative-Motion of Two Particles Using Translating Axes	Lecture
	Tue (9-10)	Chapter 3: Mechanical Properties of Materials: Stress–Strain Behavior of Ductile and Brittle Materials	Lecture
	Thu (9-10)	SECOND EXAM	Lecture
12	Sun (9-10)	Chapter 13: Kinetics of a Particle: Force and Acceleration: Newton's Second Law of Motion	Lecture
	Tue (9-10)	Chapter 3: Mechanical Properties of Materials: Poisson's Ratio	Lecture
	Thu (9-10)	Chapter 13: Kinetics of a Particle: Force and Acceleration: The Equation of Motion	Lecture
13	Sun (9-10)	Chapter 4: Axial Load: Saint-Venant's Principle	Lecture
	Tue (9-10)	Chapter 13: Kinetics of a Particle: Force and Acceleration: Equation of Motion for a System of Particles	Lecture
	Thu	Chapter 4: Axial Load: Elastic Deformation of an Axially Loaded	Lecture



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	(9-10)	Member	
14	Sun (9-10)	Chapter 13: Kinetics of a Particle: Force and Acceleration: Equations of Motion: Rectangular Coordinates	Lecture
	Tue (9-10)	Chapter 4: Axial Load: Principle of Superposition	Lecture
	Thu (9-10)	Chapter 13: Kinetics of a Particle: Force and Acceleration: Equations of Motion: Normal and Tangential Coordinates	Lecture
15	Sun (9-10)	Chapter 7: Chapter 4: Axial Load: Statically Indeterminate Axially Loaded Members	Lecture
	Tue (9-10)	Chapter 13: Kinetics of a Particle: Force and Acceleration: Equations of Motion: Cylindrical Coordinates	Lecture
	Thu (9-10)	Chapter 4: Axial Load: The Force Method of Analysis for Axially Loaded Members	Lecture

3. Grade Distribution:

Assessment	Grade	Week No.
- Midterm Exam	30%	7 th Week
-Assignments (Reports /Quizzes/ Seminar / Tutorials/ Home works)	20%	1-16 th Week
- Final Examination	50%	16 th Week

Note: Make-up exams will be offered for valid reasons. It may be different from regular exams in content and format.