The University of Jordan
School of Engineering
Civil Engineering department
Spring 2019
properties of concrete 0901241 (3 Credit hours)

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Office hours 12:30 - 2:00 Monday and Wednesday.

Recommended books

Engineering Mechanics: Statics (12th edition) by Russell C. Hibbeler.
Engineering Mechanics: Statics (7th edition) by J.L. Meriam and L. Kraige.
Engineering Mechanics 1: Statics (2nd edition) by Gross, D., Hauger, W., Schröder, J., Wall, W.A., Rajapakse,
Engineering Mechanics: Statics (5th edition) by Anthony M. Bedford and Wallace Fowler

Course outline

1- General principles.

2- Force Vectors.

3- Force systems (2D and 3D)

4- Equilibrium of particles and rigid bodies (2D and 3D)

5- Structures (trusses, frames and machines)

6- Distributed forces (centroids and centers of mass)

7- Beams (shearing force and bending moment diagrams)

8- Moment of inertia

Grading

The marks will be distributed as follows

1- First Exam 20%

2- Second Exam 30%

3- Participation, Homework, Attendance and Quizzes 10%

4- Final Exam 40%

Learning outcomes

1- Solve for the resultants of any force systems.
2- Analysis of Moments and force system resultants.
3- Draw and label free-body diagrams.
4- Analyze Particle equilibrium.
5- Determine equivalent force systems.
6- Analyze rigid body equilibrium.
7- Use the method of sections to determine and draw internal forces (shear and bending moment).
8- Determine the internal forces in simple span trusses and beams.
9- Obtain the centroid, first moment and second moment of an area.

Topics to be Covered

Chapter 1	Basics and Concepts
Chapter 2	Force Vectors Vector Operations Resolving of Forces Resultant of Forces using: Trigonometry Method Graphical and Analytical Cartesian Method
Chapter 3	Equilibrium of Particles Free Body Diagram Concepts Solving Equilibrium Problems Spring and Pulley Systems Concepts
Chapter 4	Force System Resultants Moment Concepts Moment of Couples Resolution of Forces into a single force and couple acting at another point [Equivalent Systems] Distributed Loads
Chapter 5	Equilibrium of Rigid Bodies Free Body Diagram Concepts Solving Equilibrium Problems
Chapter 6	Structural Analysis Truss Concepts Determining the Forces in the Members of a Truss: Joint Method and Section Method
Chapter 7	Internal Forces Method of Sections to Determine the Internal Bending Moments and Shear Forces Shear Forces Diagram and Bending Moments Diagram
Chapter 8	Centroid and Gravity Concepts of the Center of Gravity Center of Mass and the Centroid
Chapter 9	Moments of Inertia for Areas Parallel-Axis Theorem for an Area Radius of Gyration of an Area Moments of Inertia for Composite Areas