

Course: MECH 210 – Statics & Dynamics, Fall 2019
Instructor: Ghasem Sam Behfarshad
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Calendar Description

Review of vector algebra. Statics: forces, moments, resultants of force systems, distributed loads, conditions of equilibrium, analysis of statically determinate structures, dry friction problems, principle of virtual work, and energy formulations. Dynamics: components of velocity and acceleration, motion analysis, force/acceleration, work/energy, and impulse/momentum principles.

Intended Learning Outcomes

Upon successful completion of this course a student will be able to:

- Analyze the forces acting both externally and internally on static objects and structures.
- Utilize the matrix analysis method in both static and dynamic situations.
- Plot the displacement, velocity and acceleration of points within many different mechanisms.
- Present analyses in a complete and clear manner.
- Explain the various structural forms including rods, connections, beams, circular shafts and frames and machines
- Explain the kinematics of particles and groups of particles. (How particles move and accelerate relative to a stationary axis and how they move relative to other particles)
- Explain the kinetics of particles and groups of particles using: Force/acceleration; impulse/momentum; and, work/energy methods (How particles are influenced by external forces)

Text & References

ENGINEERING MECHANICS: Statics and Dynamics, 14th EDITION, By: R. C. HIBBELER

Course Outline (subject to modification, if necessary)

	Week	Course Content
Statics	1	Review of vector, the laws of static and dynamic equilibrium.
	2	Moment of a forces, applied torque, force couples.
	3	Analysis of static forces on objects and structures, including rods, connections, beams, circular shafts, simple trusses.
	4	Analysis of force systems including: cables, frames, distributed loads, point loads.
	5	Analysis of force systems including: cables, frames, distributed loads, point loads.
	6	More analysis of force systems including dry friction.
Dynamics	7	Vector analysis of dynamic systems, algebraic methods.
	8	Relative position and velocity analysis for rigid bodies
	9	Relative acceleration and analysis for rigid bodies.
	10	Work and energy principles.
	11	Work and energy principles.
	12	Impulse and momentum: both linear and angular.
	13	Impulse and momentum: both linear and angular.
	14	Course Review

Evaluation & Grading System

Assignments 10%
Quizzes 10%
Midterm Exam 35% (closed book/notes)
Final Exam 45% (closed book/notes)
 → **You must pass the final exam in order to pass MECH 210**

A+	90-100	B-	70-72
A	85-89	C+	65-69
A-	80-84	C	60-64
B+	77-80	D	50-59
B	73-76	F	<50