



Philadelphia University

Faculty of Engineering - Department of Mechatronics
Engineering

Course Information

Title: Dynamics and vibrations (0640233)

Prerequisite: Statics and strength of material (0640234)

Credit Hours: 3 credit hours (16 weeks per semester, approximately 44 contact hours)

Textbook: Engineering Mechanics-Dynamics, 14th edition, R. C. Hibbeler, 2017

References: Dynamics, 7th edition by J. Meriam and L. Kraig, 2014

Description: This course introduces the principles of Kinematics and Dynamics of particles and extends the knowledge to cover the Kinematics and Dynamics of rigid bodies. It also introduces the vibrations principles, types, and measurements.

Course Topics:

Week	Topic
1	-Introduction -Rectilinear Motion of Particles
2-3	Curvilinear Motion of Particles
4-5	-Absolute Dependent Motion of Particles -Relative motion of two Particles.
6	Kinetics of Particles: Newton's 2 nd Law
7-8	Principle of Work and Energy and its application for a system of particles
9-10	Principle of Impulse and Momentum
11-12	Planer Kinematics of rigid bodies
13-14	Planar Kinetics of rigid bodies
15	Introduction to vibrations

Course Learning Outcomes and Relation to ABET Student Outcomes:

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

1.	Draw the free-body diagram for a particle or for a rigid body in plane motion.	[1]
2.	Understand the basic concepts of force, mass and acceleration, of work and energy, and of impulse and momentum.	[1]
3.	Apply the above mentioned three basic concepts and to understand their respective advantages.	[1]
4.	Understand the geometry of the motion of particles and the motion of rigid	[1]

	bodies.	
5.	Effectively communicate in writing an assignment and solve specified home works in teams.	[3]

Assessment Instruments:

Evaluation of students' performance (final grade) will be based on the following categories:

Exams: Two in class written exams will be given. Each will cover about 5-weeks of lectures

Quizzes: At least 10-minute quizzes will be given to the students during the semester. These quizzes will cover material discussed during the previous lecture(s).

Homework: Problem sets will be given to students. Homework should be solved individually and submitted before the due date.

Copying homework is forbidden, any student caught copying the homework or any part of the homework will receive zero mark for that homework

Participation: Questions will be asked during lecture and the student is assessed based on his/her response

Final Exam: The final exam will cover all the class material.

Grading policy:

Mid Exam	30%
Home works, Quizzes and participation	30%
Final Exam	40%
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Total:	100%

Attendance policy:

Absence from classes and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse, acceptable to and approved by the Dean of the relevant college/faculty, shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.