



Philadelphia University

Faculty of Engineering - Department of Mechanical Engineering
First Semester 2020/2019

Course Information

- Title:** Mechanical Vibrations Lab. (620415)
- Prerequisite:** Mechanical Vibration (620414)
- Credit Hours:** 1 credit hour (10 weeks per semester)
- Textbook:** Lab manual
- References:** Mechanical Vibration 5th edition in SI units, Singiresu S. Rao, Pearson, 2011.
- Description:** The course is a requirement for Mechanical engineering students. At completing this course, the student should be able to understand the vibration phenomena by transforming the physical model into a mathematical model and solve it by using the appropriate mathematical and numerical methods. Then, to find the response of vibrating system to external excitations experimentally.
- Instructor:** Eng. Lina Alkhateeb
- Office: Mechanical Engineering building, room E61300 , ext. : 2131
- Office hours: Mon, Wed.: 10:00-11:30

Experiments:

Week	Experiment
1	Introduction to Vibration
2	Mass – Spring system
3	Simple and Compound Pendulums
4	Mass Moment of Inertia Estimation-Part one: Bifilar Suspension
5	Mass Moment of Inertia Estimation-Part two: Auxiliary Mass Method
6	Forced Vibration with Negligible Damping
7	Transverse Vibration of a Beam
8	Undamped vibration absorber
9	Static and Dynamic Balancing
10	Summary of lab
11	Practical final exam
12	Theoretical final exam

Course Learning Outcomes and Relation to ABET Student Outcomes:

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

1.	Estimate the spring stiffness and gravitational acceleration by a mass- spring system	[1, 2]
2.	Study the motion of pendulums as an example of rotational motion and its vibrations.	[4, 6,7]
3.	Estimate the mass moment of inertia by a bifilar suspension system with and without auxiliary mass.	[5,4, 7]
4.	Know the transverse vibration and its catagories	[1, 2]
5.	Know the vibration absorption and its methods	[1, 2,5]

Assessment Instruments:

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

Reports: Each experiment has a report describing theory, procedure, readings, results, discussion, and conclusion.

Quizzes: Three quizzes will be given to the students during the semester. These quizzes will cover each three experiments in the lab. Fifteen minutes for each quiz.

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

Grading policy:

First	20% (10% Reports, 10% Quiz)
Second	20% (10% Reports, 10% Quiz)
Third	20% (10% Reports, 10% Quiz)
Final Exam	40% (30% Practical, 10% Theoretical)
Total:	100%

Attendance policy:

Absence from classes and/or tutorials shall not exceed 2 labs. Students who exceed the 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.

September , 2019