The University of Jordan
School of Engineering

Department	Course Name	Course Number	Semester
Mechanical Engineering	Dynamics and Vibration Lab	0904314	

2005 Course Catalog Description

Static & dynamic balancing, centrifugal force, simple & compound pendulum, bifilar suspension, mass spring system, damping coefficient and logarithmic decrement, center of percussion, Katter's reversible pendulum, torsional free vibrations, resonance response of a single degree of freedom system. Base excitation and vibration isolation.

Instructors

Name	E-mail	Sec	Office Hours		Lecture Time

Text Books

	Text book 1	Text book 2
Title	**Mechanical Vibrations**	Laboratory Manual
Author(s)	Singgiresu S. Rao	
Publisher, Year, Edition	Addison-Wesley Publishing Company, **ISBN 0-201-52686-7, 5th Edition.**	

References

Books	
Journals	
Internet links	

Prerequisites

Prerequisites by topic	Mechanical Vibration
Prerequisites by course	Mechanical Vibration (0904411)
Co-requisites by course	-
Prerequisite for	-

Topics Covered

Week	Topics	Chapter in Text	Sections
1	Simple and Compound Pendulum		
2	Center Of Percussion, Reversible Pendulum		
3	Bifilar Suspension		
4	Centrifugal Force		
5	mass spring system		
6	Simple Spring – Mass Damper System		
7	Determination Of The Mass Moment Of Inertia Of A Single Rotor		
8	Midterm Examination		
9	Determination Of The Modulus Of Rigidity Of Shaft Material,		
10	Torsional Oscillation Of A Two – Rotors System		
11	Un-damped Vibration Of A Beam, Un-damped Vibration Absorber		
12	Static And Dynamic Balancing		
13	Final Examination		

Mapping of Course Outcomes to ABET Student Outcomes

SOs	Course Outcomes
5	1. Ability to work effectively in a team in conducting experiments, collecting data, discussing results, and writing reports.
6	2. Students will be able understand the motion and the natural frequency of (1) a freely vibrating single degree of freedom un-damped motion and (2) a freely vibrating single degree of freedom damped motion. 3. Students will be able to understand and construct the equations of motion for single degree of freedom Systems. 4. Students will have an ability to obtain material properties of shafts like the shear modulus of elasticity from vibration analysis. 5. Students will have an ability to obtain material properties of shafts like the shear modulus of elasticity from vibration analysis.

Evaluation

Assessment Tools	Expected Due Date	Weight
Reports	One report for each experiment, which includes the following: Cover page (5%); Abstract (10%); Data observed (10%); Sample calculation (10%); Results and discussion (including applications) (20%); Uncertainty analysis (10%); Practical examples (5%); Conclusions (10%); Correct language (10%); Page numbering (5%); and Figures & Tables (5%).	30 %
Midterm Exam	According to the department schedule	30 %
Final Exam	According to the University final examination schedule	40 %

Contribution of Course to Meet the Professional Components

This course deals with analysis of force and moment systems for static equilibrium of structures and machine components.

Relationship to Student Outcomes

SOs	1	2	3	4	5	6	7
Availability					X	X	

Relationship to Mechanical Engineering Program Objectives (MEPOs)

MEPO1	MEPO2	MEPO3	MEPO4	MEPO5

ABET Student Outcomes (SOs)

1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3	An ability to communicate effectively with a range of audiences
4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Updated by ABET Committee, 2020