



**The Hashemite University**  
**Faculty of Engineering**  
**Department of Mechanical Engineering**  
**Course Syllabus**  
**Spring 2020**



<b>COURSE TITLE:</b>	Mechanical Vibration 3 (3,0, 0)	<b>COURSE NUMBER:</b>	110402433
<b>DESIGNATION:</b>	Compulsory	<b>PREREQUISITE(S):</b>	110402231
<b>INSTRUCTOR:</b>	Mohammad A Gharaibeh, <b>Office:</b> E3101	<b>INSTRUCTOR'S E-MAIL:</b>	mohammada_fa@hu.edu.jo
<b>OFFICE HOURS:</b>	See posted Hours		
<b>LECTURE TIME AND LOCATION</b>	<b>Section 1:</b> Sun, Tues and Thurs. 08:00-09:00		

**Course Description (catalog):**

Free and forced vibrations of damped and undamped single degree of freedom systems. Multi-degree of freedom systems: natural frequencies, mode shapes, modal analysis. Design of vibration isolator and Shock absorber

**Textbook(s) and/or Other Supplementary Materials:**

Engineering Vibrations, by D. Inman, 4<sup>th</sup> Edition, Prentice Hall, 2001.

**Major Topics Covered:**

Topic (Refer to Course Content for detailed Subjects)	# Lectures	Contact hours
Introduction To Vibration and the Free Response	8	8
Response To Harmonic Excitation	8	8
General Forced Response **	5	5
Multiple-Degree-of-Freedom Systems	7	7
Design for Vibration Suppression	4	4
Exams (First and Second)	<b>2</b>	<b>2</b>
<b>Total</b>	<b>38</b>	<b>38</b>

**After completing the course, the student will be able to:**

1. Derive mathematically the equation of motion for a SDOF and MDOF systems (a)
2. Analysis of a vibrating system in terms of: amplitude, natural frequency and damping
3. Applying Linear algebra, Langrangian method in solving problems for MDOF systems
4. Design vibration isolator, and vibration absorber

**Student Outcomes (SO) Addressed by the Course:**

#	Outcome Description	Contribution
<b>General Engineering Student Outcomes</b>		
(a)	Ability to apply mathematics, science and engineering principles.	H
(b)	Ability to design and conduct experiments, analyze and interpret data.	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	M
(d)	Ability to function on multidisciplinary teams.	
(e)	Ability to identify, formulate and solve engineering problems.	M
(f)	Understanding of professional and ethical responsibility.	
(g)	Ability to communicate effectively.	
(h)	The broad education necessary to understand the impact of engineering solutions in a global and societal context.	
(i)	Recognition of the need for and an ability to engage in life-long learning.	
(j)	Knowledge of contemporary issues.	
(k)	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.	L
<b>H=High, M= Medium, L=Low</b>		

**Grading Plan:**

	Date	Day	Time
Midterm	30 points		
Projects	-		
Quizzes	30 points		
Final Exam	40 points		

**Prepared by:** Dr. Mohammad A Gharaibeh

**Date:** 11 Oct, 2020

