

The University of Jordan
Faculty of Engineering & Technology
Department of Mechatronics Engineering

Course Name	Dynamics and Vibrations											
Course Number	0908242											
Semester	First Semester 2015 - 2016											
2014 Catalog Description	3 Credit hours (3 h lectures). The course introduces students to the application of Newtonian mechanics in solving motion problems for particles, systems of particles and rigid bodies. Differential and integral relationships between displacement, velocity and acceleration are developed in the kinematics parts. The effect of force, energy and momentum on motion is described in the kinetics part. Mechanical vibration is also described as an application. The course is restricted to 2-D (planar) mechanisms.											
Textbook	<i>Engineering Mechanics, Dynamics, 13th SI Edition by R.C. Hibbeler, Prentice Hall</i>											
References	<ol style="list-style-type: none"> 1. <i>Vector Mechanics for Engineers, Dynamics, by Beer and Johnston, McGraw-Hill.</i> 2. <i>Engineering Mechanics, Volume 2, Dynamics, by Meriam and Kraige, Wiley.</i> 3. <i>Engineering Mechanics, Dynamics, by Bedford and Fowler, Addison Wesley.</i> 											
Instructor	Professor Mohammad Kilani											
Prerequisite	Statics and Strength of Material (908241)											
Course Outcomes	<ol style="list-style-type: none"> 1. Understand the concepts of displacement, velocity and acceleration for particles, systems of particles and rigid bodies [b, c]. 2. Identify and apply the differential and integral relationships between displacement, velocity and acceleration in various coordinate systems [a]. 3. Use Newton's laws to solve motion problems of engineering interest including that of machine parts such as gears, pulleys, chains and spring-mass systems [a, e]. 4. Use the principles of impulse-momentum, work-energy, and conservation of energy in solving motion problems [a, e] 5. Understand the concepts of power and efficiency [e,h,j]. 6. Undesrtand one degree of freedom undamped and damped free vibrations [c,e,f] 											
Topics Covered	Topic						Chepter(s) in Text					
	Kinematics of Particles						Chapter 12					
	Kinetics of Particles: Force and Acceleration						Chapter 13					
	Kinetics of Particles: Work and Energy						Chapter 14					
	Kinetics of Particles: Impulse and Momentum						Chapter 15					
	Planar Kinematics of a Rigid Body						Chapter 16					
	Planar Kinetics of a Rigid Body						Chapters 17, 18, 19					
Vibraions						Chapter 22						
Contribution to Professional Component	The course develops the conceptual framework for analyzing the causes and effects of motion for a multitude of problems of engineering interest.											
Contribution to Program Outcomes (%)	a	b	c	d	e	f	g	h	i	j	k	l
	30	20	10	-	20	10	-	5	-	5	-	-
Prepared By	Professor Mohammad Kilani											
Last Modified	March 4, 2015											

