Identification	Subject	ME 262 Dynamics, 6 ECTS			
	Department	Mechanical Engineering			
	Program	Undergraduate			
	Term	Fall 2023			
	Instructor	Dr. Mehdi Kiyasatfar			
	E-mail:	mkiyasatfar@khazar.org			
	Phone:				
	Classroom/hours	Wednesday 18:40 – 21:00			
	Office hours				
Prerequisites	Engineering Mechan	iics			
Language	English				
Compulsory/Elective	Compulsory	Compulsory			
Required textbooks	Textbook:				
and course materials	Engineering Mechanics: Dynamic by Meriam, Kraige, and Bolton, 9th edition, Wiley 2019				
Course Description	Dynamics is subdivision of mechanics that is concerned with motion of bodies				
	considering the facto	ors which cause motion. The study of	of dynamics in engineering		
	usually follows the	study of statics, which deals with	n the effects of forces on		
	bodies at rest. Dynamics has two distinct parts: kinematics, which is the study of				
	motion without reference to the forces which cause the motion, and kinetics, which				
	relates the action of forces on bodies to their resulting motions. Comprehension of				
	dynamics will provide one of the most useful and powerful tools for analysis in				
	engineering.				
Course Objective	The rapid technolo	gical developments of the presel	nt day require increasing		
	application of the principles of dynamics. These principles are basic to the analysis				
	and design of moving structures, to fixed structures subject to shock loads, to				
	robotic devices, to automatic control systems, to rockets, missiles, and spacecraft,				
	to ground and air transportation vehicles, to electron ballistic of electrical devices,				
	and to machinery of all types such as turbines, pumps, reciprocating engines,				
	hoists, machine tools, etc. Students with interest in one or more of these and many				
	other activities will constantly need to apply the fundamental principles of				
	dynamics				
Learning outcomes	Students who successfully complete the course should demonstrate the following				
Learning outcomes	outcomes by tests and homework.				
	 A knowledge of kinematic and kinetic analyses for particles and systems 				
	of particles.				
	 A knowledge of momentum and energy methods for particles and systems 				
	of particles.				
	• A knowledge of kinematic and kinetic analyses for rigid bodies.				
	• A knowledge of momentum and energy methods for rigid bodies.				
Teaching methods	Lecture x				
	Case analysis and a	ssignments	X		
Evaluation	Methods	Date/deadlines	Percentage (%)		
	Midterm Exam		25		
	Class Participation	At each lesson	5		
	Assignment	During the semester	20		
	Quiz	During the semester	10		
	Final Exam		40		
			100		
	Total		100		
Policy	Total Ethics 				
Policy	Total • Ethics Copy of other st	udents' work is highly discouraged	I. All assignments must be		
Policy	Total Ethics Copy of other st handled by the s	udents' work is highly discouraged tudent himself. This is a university pordingly	I. All assignments must be policy and violators will be		

• Preparation for class The structure of this course demands your individual effort outside the classroom for extra practice of many problems within the textbook. After each session, every student needs to put sufficient time to practice and finish the assignments by the predetermined date.
• Withdrawal (pass/fail) This course strictly follows grading policy of the School of Science and Engineering. Thus, a student is normally expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year.
• Cheating/plagiarism Cheating or other plagiarism in handling the assignments, Mid-term and Final Examinations will lead to course failure. In this case, the student will automatically get zero (0), without any considerations.
• Professional behavior guidelines The students shall behave in a way to create favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly discouraged.
• Attendance Students who attend the whole classes will get 5 marks. for three absence student loses 1 mark.
• Quiz There will be quizzes for checking understanding of content during class. We are not going to give make-up for a missing quiz due to any reason other than medical report.
• Assignment There will be a homework assignment for every chapter composed of exercises and problems.

Tentative Schedule				
Week	Topics	Textbook/Assignments		
1	Basic concepts of dynamics	Chap 1		
2	Introduction to kinematics of particles/ rectilinear motion	Chap 2		
3	Plane curvilinear motion/ Rectilinear coordinates	Chap 2		
4	Normal and tangential coordinates/ Polar coordinates	Chap 2		
5	Space curvilinear motion/ Relative motion	Chap 2		
6	Constrained motion of connected particles/ Solution to some problems	Chap 2		
7	Introduction to kinetics of particles/ Force, mass, and acceleration, Newtown's second law/ Calculation of motion	Chap 3, 4		
8	Review Midterms Exam			

9	Work and Kinetics Energy, Potential Energy	Chap 3, 4
10	Impulse and momentum	Chap 3, 4
11	Kinetics of systems of particles, Review	Chap 3, 4
12	Plane kinematics of Rigid Bodies, Rotation, Absolute motion	Chap 5
13	Plane kinematics of Rigid Bodies, relative velocity, Instantaneous center of zero velocity	Chap 5
14	Plane Kinetics of Rigid Bodies, general Equations of motion	Chap 5
15	Review, Solution to some problems	
16	Final Exam	

This syllabus is a guide for the course and any modifications to it will be announced in advance.