Identification	**Subject**	Theory of Machines, 6 ECTS	
	Department	Mechanical Engineering	
	Program	Undergraduate	
	Term	Fall 2019	
	Instructor	Mehdi Kiyasatfar	
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	Phone:		
	Classroom/hours		
	Office hours		
Prerequisites	Dynamics		
Language	English		
Compulsory/Elective			
Description	Kinematics of machines is the study of the relative motion of machine parts and is one of the first considerations of the designer in the design of the machine. Dynamic of machines treats with the forces acting on the parts of a machine and the motions resulting from these forces. A dynamic analysis is necessary to ensure that balance is provided for rotating and reciprocating parts and that all members are adequate from the standpoint of strength.		
Required textbooks and course materials	**Textbook:** J.J. Uicker, Jr., G.R. Pennock, and J.E. Shigley. Theory of Machines and Mechanisms, 4th edition, Oxford University Press, 2011. **Suggested Course Materials:** 1- F.P. Beer, E.R. Johnston Jr., and W.E. Clausen. Vector Mechanics forEngineers - Dynamics, 7th edition,McGraw-Hill Inc. 2- H.H. Mabie and C.F. Reinholz. Mechanisms and Dynamics of Machinery, 4th edition, Wiley. 3- G.H. Martin. Kinematics and Dynamics of Machines, 2nd edition, McGraw-Hill.		
Course website			
Course outline			
Course objectives			
Learning outcomes	Introduction; Displacement Analysis; Velocity Analysis; Acceleration Analysis; Force Analysis of Preliminaries; forces acting on links; graphical analysis and Mechanisms; Force Balancing; Cams; Gears.		
Teaching methods	**Lecture**		x
	Experiential exercise		-
	Assisted work		-
	Assisted lab work		-
	Others		-
Evaluation	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam		30
	Class Participation		10
	Quizzes (4-6)		20
	Lab Exercises		-
	Project		5
	Final Exam		35
	Total		100
Policy	• NO CELL PHONES are allowed during lecture and lab sessions. PLEASE turn them off before lecture! (Not silent or vibrating mode). This is a university policy and violators will be reprimanded accordingly. • Participation and interaction in classes are more important than just attendance. • No late assignments will be accepted without prior arrangement with the instructor for acceptable excuses. Medical and family emergency will be considered on case-by-case basis.		

	• No late homework will be accepted. Homework is to be completed on an individual basis. Students may discuss homework with classmates, but students are responsible for your own work. If students have consulted classmates, please note the individuals name on the top of students' assignment. • Quizzes may be given unannounced throughout the term and will count as one homework. There will be no make-up quizzes. • No make-up exams. If students miss an exam, a zero score will be assigned to the missed exam. • If students should miss class due to personal emergency or medical reasons, please notify the instructor by email immediately. A doctor's note will be required for make-up work. • Students are responsible for completing the reading assigned from the textbook related to the covered topics and for checking email regularly for important information and announcements related to the course. • University policy on academic honesty concerning exams and individual work will be strictly enforced. BE ON TIME!

Tentative Schedule		
Week	**Topics**	**Textbook/Assignments**
1	Fundamental concepts, Definitions; geometrical categorization of mechanisms; mobility;kinematic inversion; Grashof's law.	Chapter 1
2	Introduction; graphical solution of vector equations.	Chapter 2
3	Definitions; velocity polygons; apparent linear velocity of a point;apparent angular velocity; instant centers of velocity.	Chapter 3
4	Linear acceleration; angular acceleration; acceleration differencevector;	Chapter 4
5	Acceleration polygons; apparent acceleration; instant centers. **Quiz 1/ Delivery of assignments**	Chapter 4
7	Preliminaries; forces acting on links; graphical analysis andsuperposition; analytical force balance and matrix solution.	Chapter 5
8	Introduction; balancing of machinery; balancing of rotating shafts; analysis of rotor balancing.	Chapter 6
9	**Midterm Exams**	
10	Kinematics of cams, definition and classification; displacement diagrams, cam profile design,	Chapter 7
11	Dynamics of cams, rigid cam systems.	Chapter 7
12	**Quiz 2/ Delivery of assignments**	Chapter 8

13	Fundamental law of gearing.	Chapter 9
14	Automotive transmission, Planetary Gears	Chapter 9
15	Project	
	Final Exam	

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