Identification	Subject	ME 421 Hydraulic and Pneumatic Systems, 6 ECTS		
	Department	Mechanical Engineering		
	Program	Undergraduate		
	Term	Spring 2024		
	Instructor	Dr. Mehdi Kiyasatfar		
	E-mail:	Mehdi Kiyasatfar@khazar.org		
	Phone:			
	Classroom/hours			
	Office hours			
Prerequisites	Fluid Mechanics			
Language	English			
Compulsory/Elective	Compulsory			
Required textbooks and	Fluid Power with Applications" By Anthony Esposito, Prentice-Hall International. 7th			
course materials	edition 2008.			
	Fluid Power Hydraulics by Johnson, Robert Kresses 1982.			
	Power Hydraulics by J. Ashby, Prentice Hall 3rd Edition 2000.			
Course website				
Course outline	Hydraulic and Pneumatic Systems deals with the study of the operation, design and function of various pneumatics and hydraulics elements commonly used in the industry. This course also provides the students with the skills and knowledge to enable them to develop general scientific thinking.			
Course objectives	This course aims to provide the mechanical engineering student with different theories, components, and applications of hydraulic and pnoumatic power control.			
	systems	is, and applications of hydraulie an	a pheumane power control	
Learning outcomes	On successful completion of this course students will be able to:			
	 Understand the principles of fluid power systems. Analyze the main components of the fluid power systems. Read, analyze, and troubleshoot hydraulic, pneumatic, electrohydraulic, and electropneumatic circuits. Design fluid power systems 			
Teaching methods	I ecture	power systems.	v	
reaching methods	Group discussion		<u>л</u> х	
	Experiential exercise	A	X	
	Tutoriols once a mo	orth on weekends		
	Case analysis and a	osignments	v	
	Case analysis and a	issignments	A	
	Others			
Evaluation	Mathods	Date/deadlines	Percentage (%)	
Evaluation	Midterm Exam	Date/deadines	25	
	Class Participation		5	
	Seminar		10	
	Project		10	
	Oniz		10	
	Final Exam		40	
	Total		100	
Deliev	• Ethica		100	
Toncy	 Copying other students' work is highly discouraged. All assignments must be handled by the student himself. This is a university policy and violators will be reprimanded accordingly. Preparation for class 			
	The structure of	this course demands your individual	affort outside the electrocom	
	The structure of	this course demands your individual	effort outside the classroom	

	student needs to put enough time to practice and finish the assignments by the predetermined date.
•	Withdrawal (pass/fail) This course strictly follows the grading policy of the School of 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 semester 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 a favorable academic and professional environment during the class hours.
•	Attendance Students who attend the sessions will get 5 marks. For three absence student loses 1 mark.
•	Quiz There will be quizzes during the semester. The materials of the quizzes are set by the lecturer. If you actively listen to the lectures and participate in the discussions, you will be successful in answering the quiz questions.
	Seminar In this course, a seminar on one of the new topics related to mechanical engineering should be presented by the students. Relevant topics will be given to students during the course. The way of presentation and the degree of mastery of the subject will determine the grade of the students.
	Project A project assignment will be handed to the students. Students will be evaluated according to their analytical thinking, and report writing.
•	Final exam The final exam in this course includes solving problems, definitions, and basic concepts of the course.

Tentative Schedule					
Week	Date/Day (tentative)	Topics	Textbook/Assignments		
1		Syllabus. Introduction of fluid power.			
2		Pneumatic characteristics and applications.	Will be provided		
3		Air generation, treatments, and distribution	Will be provided		
4		Pneumatic actuators	Will be provided		
5		Input, control, and processing elements	Will be provided		

6	Pneumatic system design and development I	Will be provided
7	Pneumatic system design and development II	Will be provided
8	Review Midterm exam	
9	Hydraulic characteristics and applications	Will be provided
10	Hydraulic generation treatments and distribution	Will be provided
11	Hydraulic actuators	Will be provided
12	Input, control, and processing elements	Will be provided
13	Hydraulic system design and development I	Will be provided
14	Hydraulic system design and development II	Will be provided
15	Design hydraulic and pneumatic circuits to meet specific criteria.	
16	Final Exam	