HYDRAULIC PNEUMATIC

1	Course Title:	HYDRAULIC PNEUMATIC
2	Course Code:	MKRZ205
3	Type of Course:	Compulsory
4	Level of Course:	Short Cycle
5	Year of Study:	2
6	Semester:	3
7	ECTS Credits Allocated:	4.00
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	1
11	Prerequisites:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Öğr.Gör.Dr. İSMET GÜCÜYENER
15	Course Lecturers:	İsmet GÜCÜYENER
16	Contact information of the Course Coordinator:	İsmet GÜCÜYENER ismetguc@uludag.edu.tr, 02242942349, U.Ü. TBMYO Mekatronik Prg. Bşk. Görükle Bursa
17	Website:	
18	Objective of the Course:	In this course, aimed to gain competence of design processes of hydraulic and pneumatic circuits
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	

	1	Being able to use the pneumatic circuit elements
	2	Being able to use power units of the hydraulic and pneumatic
	3	Being able to calculate pressure, force, velocity, power and energy values of the hydraulic and pneumatic systems
	4	Being able to calculate of flow-shapes of the hydraulic and pneumatic systems
	5	Being able to design of command circuits of the hydraulic and pneumatic systems
	6	Being able to use of optical, magnetic, inductive and capacitive sensors in the hydraulic and pneumatic circuits
	7	Being able to use timer and counter relay in the hydraulic and pneumatic circuits
	8	Being able to use stepper valve in the hydraulic and pneumatic circuits
	9	
	10	

21 Course Content:

Course Content:

Week	Theoretical	Practice
1	Advantages and disadvantages of hydraulic and pneumatic systems	Introduction of laboratory
2	Used compressor types in the pneumatic power units	Determination of actuator pressure of pneumatic actuated valve

3	Components of hydraulic power unit	Pressure measurement and velocity control of the piston at the backward and forward motion in the hydraulic systems
4	Valves and actuator types	Operated press when pressed two buttons simultaneously
5	Basic calculations in the hydraulic and pneumatic systems	The time and pressure control with the simulation of the injection press
6	Elements of electro-hydraulic and electro-pneumatic	Time delay-off and time delay-on relay operation
7	Logic applications of pneumatic systems	Using of the counter and time delay-off relay for batch process
8	Repeating Courses first midterm	Using of the counter and time delay-off relay for batch process
9	Used sensors in the systems of pneumatic and hydraulic	Vacuum creating and the using of the vacuum actuated valve
10	Used timers and counters in the systems of pneumatic and hydraulic	Hidromotor usage and rpm measurement in the hydraulic systems
11	Vacuum technique and applications in the systems of pneumatic	The design of regenerative hydraulic circuit
12	Load and motion control in the systems of hydraulic	Flow divider valve usage and load control in the hydraulic systems
13	Repeating Courses second midterm	Flow divider valve usage and load control in the hydraulic systems
14	Signal overlapping in the systems of pneumatic	Stepper valve usage in the pneumatic systems
22	Textbooks, References and/or Other Materials:	Course notes, Festo Pnömatik TP 101 Festo Elektrohidrolik TP 601

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	14	2.00	28.00
Self study and preperation	14	2.00	28.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	2	10.00	20.00
Others	0	0.00	0.00
Final Exams	1	20.00	20.00
Total Work Load			124.00
Total work load/ 30 hr			4.13
ECTS Credit of the Course			4.00

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Quiz	0	0.00
Final Exam	1	50.00
Contribution of Term (Year) Learning Activities to		50.00
Contribution of Final Exam to Success Grade		50.00
Measurement and Evaluation Techniques Used in the		

24	**ECTS / WORK LOAD TABLE**

25	**CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS**															
	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	3	3	2	4	5	5	5	3	5	5	4	0	0	0	0	0
ÖK2	5	5	0	0	5	5	5	3	5	5	4	0	0	0	0	0
ÖK3	3	3	4	4	5	5	5	3	5	5	4	0	0	0	0	0
ÖK4	0	0	0	0	5	5	0	4	5	5	4	0	0	0	0	0

ÖK5	0	0	0	0	5	5	0	4	5	5	4	0	0	0	0	0
ÖK6	3	4	4	5	5	5	4	5	5	5	5	0	0	0	0	0
ÖK7	1	1	1	5	5	5	4	4	4	4	4	0	0	0	0	0
ÖK8	0	0	0	5	5	5	4	0	4	4	4	0	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**