HYDRAULIC MACHINERY

1	Course Title:	HYDRAULIC MACHINERY
2	Course Code:	MAK3006
3	Type of Course:	Compulsory
4	Level of Course:	First Cycle
5	Year of Study:	3
6	Semester:	6
7	ECTS Credits Allocated:	5.00
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	No
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. İRFAN KARAGÖZ
15	Course Lecturers:	Prof.Dr. İrfan Karagöz Prof.Dr. Atakan Avcı
16	Contact information of the Course Coordinator:	karagoz@uludag.edu.tr 40018
17	Website:	
18	Objective of the Course:	This course is designed to introduce engineering students to the application of governing fluid flow equations and dimensional analysis to the hydraulic machinery, to give the student working knowledge of the principles, design and operation of pumps and turbines.
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	

		1	Ability to apply the basic principles and equations governing the fluid flow to turbomachinery
		2	Ability to analyze the means by which the energy transfer is achieved in the chief types of hydraulic machines and efficiency
		3	Ability to explain the principles, design and operation characteristics of pumps and turbines
		4	Ability to use the dimensionless numbers for turbomachines
		5	Ability to analyze and design hydraulic machinery systems,
		6	Ability to select the right type of pump and turbine for given operating conditions
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21	Course Content:	

Course Content:

Week	Theoretical	Practice

1	Review of the governing equations of fluid mechanics and thermodynamics. Definition of turbomachines and classification	
2	Basic theory of turbomachinery. Euler equation. Definitions of velocities	
3	Hydraulic turbines. Definitions of power and efficiencies	
4	Action turbines. Basic theory, design and operation	
5	Reaction turbines. Basic theory, design and operation.	
6	Cavitation. Quiz 1	
7	Analysis and design of axial flow hydraulic turbines.	
8	Related dimensionless parameters and similarity.	
9	Repeating courses and midterm exam	
10	Pumps and fans. Definitions of power and efficiencies. Classification	
11	Centrifugal pumps and fans. Basic theory and design	
12	Cavitation in pumps. Characteristic curves	
13	Pump application and selections. Similarity in pumps.	
14	Positive displacement machinery, Quiz 2	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and prepeation	12	3.00	36.00
Homeworks	5	8.00	40.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	0	8.00	8.00
Others	3	4.00	12.00
Final Exams	1	12.00	12.00
Total Work Load			150.00
Total work load/ 30 hr			5.00
ECTS Credit of the Course			5.00

(overlapping text)
23	Assesment			
TERM LEARNING ACTIVITIES	NUMBE	WEIGHT		
Midterm Exam	1	30.00		
Homework/project	0	0.00		
Final Exams	4	100.00		
Success Grade				
Total	100.00			
Measurement and Evaluation Techniques Used in the Course				

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	5	4	3	0	2	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	4	0	3	0	0	0	0	0	0	0	0	0	0	0

ÖK3	0	5	0	0	3	0	0	0	0	0	0	0	0	0	0	0
ÖK4	2	4	3	0	5	0	0	0	0	0	0	0	0	0	0	0
ÖK5	2	2	5	0	3	0	0	0	0	0	0	0	0	0	0	0
ÖK6	1	0	4	0	2	0	0	0	0	0	0	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