

**COURSE IDENTIFICATION FORM**

**Course Code and Name:** IM5024 Water Forces Facilities

**Department of :** CIVIL ENGINEERING /  
 DEPARTMENT OF CIVIL ENGINEERING /  
 DEPARTMENT OF CIVIL ENGINEERING THESIS  
 MASTER'S DEGREE PROGRAM

Semester	Theoretic Hour	Practice Hour	Total Hour	Credits	ECTS	Education Language	Type: Compulsory Elective
Fall	3	0	3	3	5	Turkish	Optional
Prerequisite (s)		-					
Instructor		Asst. Prof. Dr. Yusuf DOGAN				Mail : ydogan@munzur.edu.tr Web :	
Course Assistant						Mail : Web :	
Groups / Classes							
Course Aim		Study of hydroelectric energy and its place in energy production. Hydrological and environmental analysis for hydropower facilities. Planning, design and operation of hydropower facilities.					
Course Goals		Introduction of Hydropower Plants, Elements. Environmental Effects of Hydropower Plants. Rainfall-Flow Relations. Determination of Installed Power. Determination of Project Flow of Natural Flow Power Plants. Determination of Operating Flow Rates, Reservoir Volumes and Reservoir Operation of Accumulator Plants. Energy Losses. Water Intake Structures. Sedimentation Basins. Transmission with Free Surface Flows. Functions and Dimensioning of Loading Chambers. Transmission with Pressure Flows, Balance Shafts and Dimensioning. Mass Oscillation Movements. Regulation (Balancing) Reservoirs. Pressure Pipes and Dimensioning. Spillway and Side Weirs. Pelton, Francis and Kaplan Turbines.					
Course Learning Outs and Proficiencies		<ul style="list-style-type: none"><li>• Study of hydroelectric power and its place in energy production</li><li>• Hydrological and environmental analysis for hydropower facilities</li><li>• Planning, design and operation of hydropower facilities</li></ul>					
Course Basic and Auxiliary Contexts		Vischer, D.L., Hager,W.H., 2005. Dam Hydraulics, Wiley Series in Water Resources Engineering. Prof. Dr. M. Emin EMİROĞLU – Su Kuvveti Tesisleri Ders Notları					
Methods of Give a Lecture		Face to face					

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Assessment Criteria		If Available, to Sign (x)	General Average Percentage (%) Rate
	1. Quiz	X	50
	2. Quiz		
	3. Quiz		
	4. Quiz		
	5. Quiz		
	Oral Examination		
	Practice Examination (Laboratory, Project etc.)		
	Final Exam	X	50
Semester Course Plan			
Week	Subjects		
1	Definition and importance of hydroelectric energy. Power and energy requirements of networks.		
2	Elements of hydropower plants and their environmental impacts.		
3	Hydrological analysis and determination of installed capacity.		
4	Determination of flow rates of natural flow and storage systems. Reservoir operation.		
5	Hydraulic concepts and calculation of energy losses.		
6	Water intake structures and sedimentation basins		
7	Conduction by free surface currents.		
8	Mid-term exam		
9	Functions and dimensions of loading rooms		
10	Conduction by pressurized currents.		
11	Surge tanks and their dimensions. Water hammer		
12	Pumped accumulation systems. Regulatory (balancing) chambers		
13	Pressure pipes and their sizing		
14	Spillways and side weirs Pelton, Francis and Kaplan turbines.		