COURSE IDENTIFICATION FORM

Course Code and Name: IM5062 DIMENSIONAL ANALYSIS AND HYDRAULIC MODEL THEORIES	**Department of : CIVIL ENGINEERING / CIVIL ENGINEERING DEPARTMENT / HYDRAULICS MASTER PROGRAM WITH THESIS**

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	Assist. Prof. Meral KORKMAZ	**Mail :** meralkorkmaz@munzur.edu.tr **Web :**
Course Assistant		**Mail :** **Web :**
Groups / Classes		
Course Aim	• Basics of the physical model concept. • Dimensional analysis, dimensional homogeneity, and major dimensionless numbers. • Model concept and deriving dynamic similarity conditions. • Distorted and undistorted models. • Monitoring, measurement, and evaluation methods used in hydraulic models. • Vibration models in hydraulic structures.	
Course Goals	• To provide students with knowledge about the mathematical modeling of engineering problems. • To teach various modeling types and rules specific to different engineering problems.	
Course Learning Outs and Proficiencies	• Students will learn to model engineering problems mathematically. • • They will understand different modeling types and rules for specific engineering issues.	
Course Basic and Auxiliary Contexts	• Martin, R. (Editor), 1998: *Recent Advances in Hydraulic Physical Modelling*, NATO ASI Series • Assoc. Prof. Dr. Mualla Öztürk – Dimensional Analysis and Hydraulic Model Theory Lecture Notes	

Methods of Give a Lecture	Theoretical lessons, discussions, and presentations.

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	Fundamentals of the Physical Model Concept. Unit Systems, Dimensional Analysis, Dimensional Homogeneity
2	Major Dimensionless Numbers Used in Hydrodynamics
3	Significant Figures with Error Theory. Similarity Theory
4	Model Concept, Deriving Dynamic Similarity Conditions
5	Distorted and Undistorted Models
6	Deriving Reynolds and Froude Numbers from NAVIER-STOKES Equations and Their Physical Interpretations
7	Concepts of Reynolds and Froude Models. Monitoring, Measurement, and Evaluation Methods Used in Hydraulic Models
8	Midterm Exam
9	River Models: Fixed Bed Models
10	Sediment Transport in Rivers; Movable Bed Models
11	Investigation of the Dynamic Behavior of Structures Affected by Flow or Waves
12	Autoexcitation. Vibration Models in Hydraulic Structures. Cavitation Models. Hydrodynamic Effects on Hydraulic Structures. Hydrodynamic Events in Energy Dissipation Structures
13	Modeling of Spillways and Energy Dissipation Structures

14	Stratified Flow Models: Discharges; Internal Wave Models; Sedimentation Models. Reservoir and Cooling Pool Models