COURSE IDENTIFICATION FORM

Course Code and Name IM5063 WASTEWATER TREATMENT TECHNOLOGIES				**Department of :** CIVIL ENGINEERING / MASTER PROGRAMME			
Semester	**Theoretic Hour**	**Practice Hour**	**Total Hour**	**Credits**	**ECTS**	**Education Language**	**Type: Compulsory Elective**
Atumn/Spring	3	0	3	3	5	Turkish	Optional
Prerequisite (s)							
Instructor		Asst. Prof. Dr.Hilal ARSLANOĞLU IŞIK				**Mail : hilalarslanoglu@munzur.edu.tr Web :**	
Course Assistant						**Mail : Web :**	
Groups / Classes		Postgraduate (Master's Degree)					
Course Aim		To have knowledge about physical, chemical and biological processes used in wastewater treatment.					
Course Goals		The aim is for students to understand the physical , chemical and biological processes used in wastewater treatment.					
Course Learning Outs and Proficiencies		1. Have knowledge about physical, chemical and biological processes in purification. 1.1. Recognize the basic units in the treatment plant. 1.2. Knows the working principles and theories of the units in the treatment plant. 1.3. Makes project calculations of the treatment plant units. 1.3. Gain basic knowledge that will assist in water treatment plant project design. 1.4. Gain knowledge of biological processes related to wastewater treatment. 1.5. Knows the mechanisms and theories related to biological processes and biological treatment. 1.6. Recognize the chemicals required for chemical processes and calculate their quantities. 2. Understand the problems related to controlling environmental pollution. 2.1. Be able to establish a relationship between the information possessed and the problems encountered in the treatment process (resulting from the project or the operation). 2.2. It can produce practical and permanent solutions to problems that occur in physical units in treatment within the framework of engineering.					

	3. Be able to prepare a report on the basic processes in purification, as a team or individually. 3.1. Performs case study analysis. 3.2. Prepares a report in accordance with ethical rules and writing guidelines.
Course Basic and Auxiliary Contexts	• MetCalf and Eddy ; Wastewater Engineering , 2003. Treatment and Reuse , 4th Edition, • Muslu Y. 2002. Unit Operations and Unit Processes in Environmental Engineering, Volume I, ITU Publications, • Sengul F., Kucukgul EY 1995. Physical Chemical Unit Operations and Processes in Environmental Engineering, Dokuz Eylul University Faculty of Engineering Publications No: 153, • Fikret Kargı, 1995. Bioprocesses in Environmental Engineering , Dokuz Eylül University Faculty of Engineering Publications No: 234, • Kadir Kestioğlu , 2001. Biochemical Processes in Wastewater Treatment, • Eyüp Debik , Neslihan Manav, Tamer Coşkun, Biological Basic Operations Lecture Notes • Olcay Tünay , 1996. Chemical Processes in Environmental Engineering, Istanbul Technical University Faculty of Civil Engineering Press,
Methods of Give a Lecture	The course will be conducted in the form of mutual explanation, question and answer, drill and practice, individual and group work, homework, problem solving and evaluation.

		If Available, to Sign (x)	General Average Percentage (%) Rate
Assessment Criteria	**Midterm Exam**	**X**	**10**
	Homework	**X (4pcs)**	**20**
	Presentation	**X (1 Piece)**	**10**
	Quiz	**X (2 Pieces)**	**10**
	Oral Exam		
	Practical Exam (Lab , Project etc.)		
	Final Exam	**X**	**50**

Semester Course Plan	
Week	**Subjects**
1	Overview of basic processes
2	Types and mechanisms of screens, sand traps, grease traps, grinders, current balancing tanks, types, selection
3	Mixing mechanisms, energy costs and mixer types, sedimentation mechanisms,
4	Primary sedimentation, flotation , gas transfer, removal of volatile organic compounds and mass balance
5	Filtration theory, membrane theory
6	Microbial metabolism and growth, enzymes and their functions, biological treatment kinetics
7	**MIDTERM EXAM**
8	Classification of activated sludge processes
9	Aerobic biofilm processes
10	Anaerobic treatment, sludge treatment and disposal
11	Balancing **,** neutralization processes, chemical oxidation methods, disinfection and chlorination processes
12	Chemical precipitation, coagulation processes, flocculation processes, adsorption processes
13	Advanced purification methods
14	Advanced purification methods