



**MARMARA UNIVERSITY - Faculty of Engineering**

**SYLLABUS**

**Environmental Engineering**

**2017-2018 Fall Semester**

Course Code	Course Name	Course Type	Weekly Course Hours			Credits	ECTS	Weekly Time & Classroom Schedule	
			T	A	L				
<b>ENVE 430/4030</b>	Hazardous and Special Waste Management	Compulsory	3	0	0	3	5	Wed 11:30-13:20 MC368 Fri 11:30-12:20 MB241	
<b>Prerequisite to</b>									
<b>Course Lecturer</b>	Prof. Barış ÇALLI				<b>Office Hours Schedule</b>		Wednesday 14:30-16:20		
<b>E-mail</b>	<a href="mailto:baris.calli@marmara.edu.tr">baris.calli@marmara.edu.tr</a>				<b>Office / Room</b>		MB641		
<b>Phone</b>	216 348 02 92 / 1289				<b>Phone</b>		216 348 13 69 / 1617		
<b>Teaching Assistant(s)</b>	R. Önder SÜRMEİ				<b>Office / Room</b>				
<b>E-mail</b>	<a href="mailto:rsurmeli@marmara.edu.tr">rsurmeli@marmara.edu.tr</a>								
<b>Course Objectives</b>	The purpose of this course is to provide an introduction to identification and classification of hazardous waste, engineering principles related to minimization, prevention and treatment of hazardous wastes using physicochemical processes, solidification & stabilization technology, biological and thermal methods. Land storage and disposal will be discussed. An overview will be given about the management of special wastes such as: household hazardous waste, batteries, waste electrical & electronic equipment, used oil, end-of-life vehicles, scrap tires, construction & demolition waste.								
<b>Learning outcomes</b>	1. Identify and classify hazardous waste (PO1, PO4) 2. Understand the concept of hazardous waste minimization, recycling and recovery (PO1, PO2, PO4, PO7) 3. Be able to select the most appropriate treatment and disposal method for hazardous waste (PO2, PO3, PO8) 4. Know how to manage special wastes (PO2, PO4, PO13)								
<b>Textbooks and/or References</b>	1. LaGrega M, Buckingham P and Evans J. 'Hazardous Waste Management' 2nd Ed., McGraw-Hill, 2000. 2. Tchobanoglous G and Kreith F 'Handbook of Solid Waste Management' 2nd Ed., McGraw-Hill, 2000 3. Cheremisinoff N.P 'Handbook of Solid Waste Management and Waste Minimization Technologies' Butterworth-Heinemann, 2003 4. Tchobanoglous G, Theisen H and Vigil SA 'Integrated Solid Waste Management, Engineering Principles and Management Issues' McGraw-Hill, 1993								
<b>Teaching methods</b>	White board, Digital projector, Technical site visits								
<b>WEEK</b>	<b>Date</b>	<b>TOPICS</b>						<b>Reference No - Section</b>	
Week 1	13.09.2017-15.09.2017	Hazardous Waste: Sources of Generation and Classification						Ref.1 - Chapter 1	
Week 2	20.09.2017-22.09.2017	Waste Minimization and Pollution Prevention						Ref.1 - Chapter 7	
Week 3	27.09.2017-29.09.2017	Physicochemical Treatment of Hazardous Wastes - Quiz 1						Ref.1 - Chapter 9	
Week 4	11.10.2017-13.10.2017	Biological Treatment of Hazardous Wastes						Ref.1 - Chapter 10	
Week 5	18.10.2017-20.10.2017	Stabilization and Solidification of Hazardous Wastes						Ref.1 - Chapter 11	
Week 6	25.10.2017-27.10.2017	Thermal Treatment of Hazardous Waste - Quiz 2						Ref.1-Chapter 12	
Week 7	10.11.2017	Landfilling of Hazardous Waste						Ref.1 - Chapter 13	
Week 8	15.11.2017-17.11.2017	Household Hazardous Waste						Ref.2 - Chapter 10	
Week 9	22.11.2017-24.11.2017	Batteries - Quiz 3						Ref.2 - Chapter 11A	
Week 10	29.11.2017-01.12.2017	Waste Electrical & Electronic Equipment						Ref.2 - Chapter 11E	
Week 11	06.12.2017-08.12.2017	Used Oil						Ref.2 - Chapter 11B	
Week 12	13.12.2017-15.12.2017	Scrap Tires and End-of-life Vehicles						Ref.2 - Chapter 11C	
Week 13	20.12.2017-22.12.2017	Construction and Demolition Waste - Quiz 4						Ref.2 - Chapter 11D	
Week 14	27.12.2017	Presentation of term projects							
<b>Evaluation Tools</b>		<b>Evaluation Tool</b>	<b>Quantity</b>	<b>Date</b>	<b>Weight in Total (%)</b>	<b>Weight in Semester Evaluation (%)</b>			
		Final Exam	1		40				
		Final Make-up Exam (if exists)							
		Semester Evaluation			60	100			
		Midterm(s)	1		30	50,0			
		Quiz(zes)	4		10	16,7			
		Project(s)	1		10	16,7			
		Homework(s)							
		Laboratory							
		Other (attendance)	42		10	16,7			
<b>Program and</b>	<b>No</b>	<b>Program Outcomes</b>				<b>Relations</b>			
		<b>1</b>	Having knowledge about mathematics, science and environmental engineering as the owner of the accumulation of sufficient information about the theoretical and applied knowledge in these areas. Ability to apply the model to solve theoretical and applied engineering problems.					X	
		<b>2</b>	Ability to identify, formulate and solve complex problems. For this purpose, selecting and applying appropriate methods, analysis and modeling skills.						
		<b>3</b>	Ability to design complex system, process, device or product under realistic constraints and conditions, to meet certain requirements. For this purpose to apply the methods of modern design.						
		<b>4</b>	Ability to select and use modern techniques and tools required for development of environmental engineering applications, the ability to use information technology effectively.						
		<b>5</b>	Design experimental setup to investigate the environmental engineering problems, conduct experiments, collect data, analyze and interpret results.						
		<b>6</b>	Ability to work effectively with disciplinary and multi-disciplinary teams, self-study skills.						
		<b>7</b>	Ability to communicate effectively in oral and written, knowledge about at least one foreign language.						
		<b>8</b>	Awareness of the need for lifelong learning, information access, monitoring and continuous self-renewal ability in science and technology developments.						
		<b>9</b>	Professional and ethical responsibility.						
		<b>10</b>	Having knowledge about project management, risk management, change management. Recognition of the entrepreneurship, innovation and sustainable development in business life.						
		<b>11</b>	Having knowledge about environmental engineering applications on the universal and social dimensions of health, environmental and safety impacts, contemporary issues, engineering solutions, and awareness of the legal consequences.					X	
<b>***</b>					<b>Language of Instruction: English</b>				
<b>Evaluation Tool</b>	<b>Quantity</b>	<b>Student Workload Hours</b>			<b>Evaluation Tool</b>	<b>Quantity</b>	<b>Student Workload Hours</b>		
Theoretical Hours	14	42			Applied Hours				
Midterm	1	18			Final	1	21		
Quiz	4	16			Project				
Laboratory					Homework				
Atelier					Seminar				
Field Study					Presentation				
Other					Self Study	14	28		
<b>TOTAL :</b>							34	125,00	
<b>Recommended</b>								5	