

MARMARA UNIVERSITY - Faculty of Engineering

SYLLABUS

**Environmental Engineering
2023-2024 Fall Semester**

Course Code	Course Name	Course Type	Weekly Course Hours	Credits	ECTS	Weekly Time & Classroom Schedule	
ENVE 2104	Controlling the Formation of DBPs in Drinking Water	Compulsory	T A L	5	5	TBD	
Prerequisite						TBD	
Course Lecturer	Asst.Prof. Dr. Habibullah Uzun				Office Hours Schedule	TBD	
E-mail	habibullah.uzun@marmara.edu.tr				Office / Room		
Phone							
Teaching Assistant(s)						Phone	
E-mail						Office / Room	
Course Objectives	The main objective of this course is to learn the principles of the formation and control of disinfection by-products (DBPs) formed during water treatment. Topics included practical considerations and understanding of the nature of precursors (i.e., natural organic matter [NOM] and human-made compounds), regulations, disinfection process, and formation & control of regulated and emerging DBPs. The basic principles of DBP formation and their control in water treatment will be presented in lectures. Students will be strongly encouraged to understand the fundamental principles taught in the class, read peer-reviewed articles and present their work.						
Learning outcomes	By the end of the course the student 1. will understands the formation of DBPs and their control under different operational and climatic conditions 2. Will be able to make decisions during dynamic operations 3. will learn to read and present peer-reviewed articles						
Textbooks and/or References	1) Stantec Water Treatment: Principles and Design, updated 3rd Edition John C. Crittenden, R. Rhodes Trussell, David W. Hand, Kerry J. Howe, 2) Karanfil, T. Mitch, W., Westerhoff, P. and Xie, Y. Recent Advances in Disinfection ByProducts. American Chemical Society, (2015). 3) Web of Science, Science Direct, google scholar						
Teaching methods	White board, Digital projector						
WEEK	Date	TOPICS			Reference No - Section		
Week 1	TBD	Syllabus, peer-reviewed articles, and Hw description, Physical and Chemical Quality of Water					
Week 2	TBD	Drinking water treatment (overview)					
Week 3	TBD	Water treatment processes, pre-post oxidations, CT, distribution systems					
Week 4	TBD	NOM, AOM, EfoM, How are DBPs formed?, Analysis of basic water quality parameters					
Week 5	TBD	Effect of climatic patterns of the DBP precursors and other antropogenic sources					
Week 6	TBD	Health Effects, Regulations, Disinfection concept					
Week 7	TBD	Formation of Chlorination DBPs and their control					
Week 8	TBD	Formation of Chloramination DBPs and their control					
Week 9	TBD	Student Presentation 1 (peer-reviewed article 1)					
Week 10	TBD	Student Presentation 2 (peer-reviewed article 2)					
Week 11	TBD	Formation of ClO2 oxidation DBPs					
Week 12	TBD	Formation of Ozonation DBPs					
Week 13	TBD	Student Presentation 3 (peer-reviewed article 3)					
Week 14	TBD	Student Presentation 4 (peer-reviewed article 4)					
Evaluation Tools	Evaluation Tool	Quantity	Date	Weight in Total (%)	Weight in Semester Evaluation (%)		
	Final Exam	1	TBD	40			
	Final Make-up Exam (if exists)				60	100	
	Semester Evaluation				20	33,3	
	Midterm(s)	1	TBD	20			
	Quiz(ze)s	4	TBD	20		33,3	
	Project(s)	4	TBD	20		33,3	
Homework(s)	4	TBD	20		33,3		
Laboratory							
Other							
Program Outcome Relations	No	Program Outcomes			Relations		
		1	2	3	1	2	3
	1	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	
	2	Ability to identify, formulate and solve complex problems. For this purpose, selecting and applying appropriate methods, analysis and modeling skills.					X
	3	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.				X	
	4	Ability to select and use modern techniques and tools required for development of environmental engineering applications, the ability to use information technology effectively.					X
	5	Design experimental setup to investigate the environmental engineering problems, conduct experiments, collect data, analyze and interpret results.				X	
	6	Ability to work effectively with disciplinary and multi-disciplinary teams, self-study skills.					
	7	Ability to communicate effectively in oral and written, knowledge about at least one foreign language.					
	8	Awareness of the need for lifelong learning, information access, monitoring and continuous self-renewal ability in science and technology developments.					
	9	Professional and ethical responsibility.					
10	Having knowledge about project management, risk management, change management. Recognition of the entrepreneurship, innovation and sustainable development in business life.						
11	Having knowledge about environmental engineering applications on the universal and social dimensions of health, environmental and safety impacts, environmental protection solutions, and awareness of the legal responsibilities.						
*** Lifelong Learning Programme (LLP) ***							
				Language of Instruction: English			
Evaluation Tool	Quantity	Student Workload Hours		Evaluation Tool	Quantity	Student Workload Hours	
Theoretical Hours	42	42		Applied Hours	0	0	
Midterm	2	15		Final	1	10	
Quiz				Project	4	20	
Laboratory				Homework	4	40	
Atelier				Seminar			
Field Study				Presentation			
Other				Self Study			
					TOTAL :	53	127,00
Recommended ECTS Credit (Total Hours / 25) :							5,08

1: weak, 2: moderate, 3: strong