MARMARA UNIVERSITY - Faculty of Engineering

Environmental Engineering

SYLLABUS

2022-2023 SPRING

Course Code	Course Name	Course Type	Weekly Course Hours T	A	L	Credits	ECTS	Weekly Time & Classroom Schedule			Weekly Time & Classroom Schedule
ENVE XXXX	Emerging Contaminants in the Environment	Technical Elective	3	0	1	5	5				
Prerequisite	-	**Prerequisite to**				-					

Course Lecturer	Gül Gülenay Hacıosmanoğlu
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Office Hours Schedule	
Office / Room No	M4-230
Teaching Assistant(s)	
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Course Objectives
To introduce the students to the main concepts related to contaminants of emerging concern (CECs)
To teach the behavior and fate of CECs in the environment
To provide the tools necessary to assess environmental impacts of CECs
To explain the state-of-the-art technologies for the management of CECs

Teaching Methods
Face to face lecture, Powerpoint Presentations, Lecture Notes

Learning Outcomes
By the end of the course the students will be able to
1. Understand the sources, behavior and fate of CECs in the environment
2. Know the regulatory considerations related to CECs
3. Apply the tools for environmental impact assessment
4. Know the management strategies and advanced treatment methods for CECs.

Textbooks and/or References

1	Morin-Crini, Nadia, Eric Lichtfouse, and Grégorio Crini. Emerging Contaminants Vol. 1. (65). Springer International Publishing, 2021.
2	Bell, Caitlin H., et al. (ed.). Emerging contaminants handbook. CRC Press, 2019.
3	Dunnivant, Frank M., and Elliot Anders. Pollutant fate and transport in environmental multimedia. John Wiley & Sons, 2019.
4	Compton, Paul, et al., eds. Environmental management in practice: Vol 1: Instruments for environmental management. Routledge, 2013.
5	Hernandez Maldonado, Arturo, and Lee Blaney, eds. Contaminants of emerging concern in water and wastewater: advanced treatment processes. Butterworth-Heinemann, 2019.

WEEK	TOPICS	Reference No - Section
Week 1	Introduction to contaminants of emerging concern (CECs)	Crini (2021) - Chapter 1
Week 2	Types and sources of CECs: industrial chemicals, pesticides and pharmaceutically active compounds	Bell (2019) - Chapter 1
Week 3	Plastics/microplastics, endocrine disruptors, nanomaterials and other CECs	Crini (2021) - Chapter 2
Week 4	Transport and transformation processes	Crini (2021) - Chapter 2
Week 5	Transport and transformation processes (continued)	Dunnivant (2019) - Part 2
Week 6	Risk management approach and regulatory perspectives	Dunnivant (2019) - Part 3
Week 7	Risk assessment and basic ecotoxicology	Dunnivant (2019) - Part 4
Week 8	Management strategies for CECs	Compton (2013) - Part II
Week 9	Tools to assess environmental impacts of CECs	Compton (2013) - Part II.9
Week 10	Tools to assess environmental impacts of CECs (continued)	Compton (2013)-Part II.10
Week 11	Advanced and combined treatment methods	Hernandez (2019)
Week 12	Case studies and student presentations	Hernandez (2019)
Week 13	Case studies and student presentations	Hernandez (2019)
Week 14	Challenges and perspectives	Bell (2019) - Chapter 6

Evaluation Tools

Evaluation Tool	Quantity	Date	Weight in Total (%)	Weight in Semester Evaluation (%)		Weight in Semester Evaluation (%)
Final Exam	1		40	0		0
Final Make-up Exam (if exists)	1		40	0		0
Semester Evaluation			60			100
Midterm(s)	1		40			66,7
Quiz(zes)						
Project(s)						
Homework(s)	2		10			16,7
Laboratory						
Presentation	1		10			16,7

Courses vs. Program Outcome Relations

No	Program Outcomes	Relations 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.			
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.			
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.			
6	Ability to work effectively with disciplinary and multi-disciplinary teams, self-study skills.		X	
7	Abilty to communicate effectively in oral and written, knowledge about at least one foreign language.		X	
8	Awareness of the need for lifelong learning, information access, monitoring and continuous self-renewal ability in science and technology developments.			X
9	Professional and ethical responsibility.		X	
10	Having knowledge about project management, risk management, change management. Recognition of the entrepreneurship, innovation and sustainable development in business life.		X	
11	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	

*** Lifelong Learning Programme (LLP) ***

Language of Instruction: English

Evaluation Tool	Quantity	Student Workload Hours	Evaluation Tool	Quantity	Student Workload Hours
Theoretical Hours	14	42	Applied Hours		
Midterm	1	15	Final	1	15
Quiz			Project		
Laboratory			Homework	2	10
Atelier			Seminar		
Field Study			Presentation	1	9
Other			Self Study	1	14
			TOTAL :	19	95,00
			Recommended ECTS Credit (Total Hours / 27) :	5,0	

1: weak, 2: moderate, 3: strong