MARMARA UNIVERSITY - Institute for Graduate Studies in Pure and Applied Sciences

Environmental Engineering

SYLLABUS

Course Code	Course Name	Course Type	Weekly Course Hours			Credits	ECTS	Campus / Weekly Time & Classroom Schedule
			T	A	L			
ENVE-8035	Multivariate Statistical Methods in Environmental Pollution	Elective	3	0	0	3	8	Friday 10:00-12:50
Prerequisite		**Prerequisite to**						

Course Lecturer	Prof. Dr. S. Sinan Keskin	**Office Hours Schedule**		
E-mail	sinankeskin@marmara.edu.tr			
Phone	(0216) 777 3609 (office) - (0216) 777 3621 (laboratory)	**Office / Room No**	MB552	
Teaching Assistant(s)		**Phone**		
E-mail		**Office / Room No**		

Course Objectives	This course covers the statistical techniques used in environmental pollution research. In this context, models for source identification and source apportionment purposes are examined in detail.
Learning outcomes	• Specify the basis behind the source-receptor models. • Specify the basis behind the source apportionment models. • Explain the reasons for potential misleading conclusions from statistical models. • Explain the advantages of including uncertainty values in receptor models. • Specify the basis for cluster analysis in environmental data.

Textbooks and/or References		
	1.	Multivariate Statistics for the Environmental Sciences, Peter J. A. Shaw, Arnold, 2003.
	2.	Receptor Modeling for Air Quality Management, Philip K. Hopke, Elsevier, 1991.

Teaching methods	Slide presentation and computer application

WEEK	Date	TOPICS	Reference No - Section
Week 1	05.03.2021	Diversity indices in pollution data	
Week 2	12.03.2021	Multiple regression analysis	
Week 3	19.03.2022	Multiple regression analysis applications	
Week 4	26.03.2021	Cluster analysis	
Week 5	02.04.2021	Cluster analysis applications	
Week 6	09.04.2021	Chemical mass balance mathematics	
Week 7	16.04.2021	Chemical mass balance assumptions and data	
Week 8	23.04.2021	Midterm exam week	
Week 9	30.04.2021	Chemical mass balance applications	
Week 10	07.05.2021	Singular value decomposition	
Week 11	21.05.2021	Principal component analysis	
Week 12	28.05.2021	Factor analysis	
Week 13	04.06.2021	Positive matrix factorization	
Week 14	11.06.2021	Receptor model applications in air pollution	
Week 15	18.06.2021	Final exam week	

	Evaluation Tool	Quantity	Date	Weight in Total (%)	Weight in Semester Evaluation (%)
Evaluation Tools	**Final Exam**	1		50	0
	Final Make-up Exam (if exists)	1		50	0
	Semester Evaluation			50	100
	Midterm(s)	1		25	50.0
	Quiz(zes)				
	Project(s)	1		10	20.0
	Homework(s)	2		5	10.0
	Laboratory				
	Other	3		10	20.0

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*** *Lifelong Learning Programme (LLP)* *******   Language of Instruction: English

Evaluation Tool	Quantity	Student Workload Hours		Evaluation Tool	Quantity	Student Workload Hours
Theoretical Hours	14	42.0		Applied Hours	--	0.0
Midterm	1	20.0		Final	1	25.0
Quiz				Project	1	20.0
Laboratory				Homework	2	20.0
Atelier				Seminar		
Field Study				Presentation	3	30.0
Other				Self Study	14	42.0
				TOTAL :	36	199.0
				Recommended ECTS Credit (Total Hours / 25) :		8