



MARMARA UNIVERSITY - Faculty of Engineering

Environmental Engineering

SYLLABUS

2022 - 2023 SPRING

Course Code	Course Name	Course Type	Weekly Course			Credits	ECTS	Weekly Time & Classroom Schedule		
			T	A	L					
	Introduction to Water Resources Planning	Elective	3	0	0	5	5			
Prerequisite		Prerequisite to								
Course Lecturer	Assoc. Prof. Sedat Yalçınkaya					Office Hours Schedule				
E-mail	sedat.yalcinkaya@marmara.edu.tr					Office / Room No		M4 226		
Phone	216 777 36 01-3618					Phone				
Teaching Assistant(s)						Office / Room No				
E-mail										
Course Objectives	This course provides the student an introduction to the planning, design, and operation of water resources systems. The course teaches fundamental methods of water resources planning and management, contemporary water resources problems, and application of tools for water resources planning and management.									
Teaching Methods	The course is divided into two sections; theoretical basis and practical teaching through useful and quantitative exercises.									
Learning Outcomes	1) Understand the fundamental concepts of integrated water resources planning and management.									
	2) An ability to design water resources systems as well as to analyze and interpret data to meet desired needs within realistic constraints such as economic, environmental, and sustainability.									
	3) An ability to identify, formulate, and solve water resources problems.									
	4) An ability to use the techniques, and modern engineering tools necessary for water resources practice.									
	5) An ability to communicate effectively through oral presentation and reports of term projects and exercises.									
Textbooks and/or References	1 Lecture Notes									
	2 Loucks, Daniel P. and Eelco van Beek, Water Resources Systems Planning and Management: An Introduction to Methods, Models and Applications, UNESCO, Paris, 2005 (Available free online: http://unesdoc.unesco.org/images/0014/001434/143430e.pdf)									
WEEK	TOPICS									Reference No -
Week 1	Introduction to water resources planning. Review the course curriculum									
Week 2	Introduction Hydrology 101									
Week 3	Ex. 1: Population and water demand									
Week 4	Introduction to water resources planning. Climate change, floods and droughts. Institutional frameworks in Turkey									
Week 5	Ex. 2: Water demand, water conservation & efficiency									
Week 6	Water Budgets - Inflows, outflow, change in storage. Ex. 3: Water budget									
Week 7	Modeling in water resources engineering. Principles of simulation modeling									
Week 8	Midterm Exam									
Week 9	Ex. 4: Basin modeling (WEAP)									
Week 10	Principles of optimization modeling. Ex. 5: Optimization modeling (Open solver)									
Week 11	Principles of environmental flows. Ex. 6: Flow regime analysis (IHA)									
Week 12	Cost-benefit analysis. Ex. 7: Cost benefit analysis									
Week 13	Risk analysis. Expected monetary value. Ex. 8: Risk analysis and expected monetary value.									
Week 14	Review									
Evaluation Tools	Final Exam	1			40					
	Final Make-up Exam (if exists)	1			40					
	Semester Evaluation				60					
	Midterm(s)	1			20					
	Quiz(ze)s									
	Project(s)									
	Homework(s)	8			40					
	Laboratory									
Field Visits to WTPs										
Courses vs. Program Outcome Relations	No	Program Outcomes			Relations*					
	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.			1	2	3			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.								X
	7	Ability 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	13	39			Applied Hours					
Midterm	1	20			Final	1	30			
Quiz					Project					
Laboratory					Homework	8	48			
Atelier					Seminar					
Field Study					Presentation					
Other					Self Study					
TOTAL :						23	137,00			
Recommended ECTS Credit (Total Hours / 20) :						5,0				
* 1: weak, 2: moderate, 3: strong										