

UNDERGRADUATE COURSE DETAILS

Course Title: Production of Biogas From Wastes				Code : USD0134		Faculty: E.F Programme: Environmental Engineering		
Education and Teaching Methods							Credits	
Lecture	Application	Lab.	Project/ Field Study	Homework	Other	Total	Credit T+A+L=Credit	ECTS
							2+0+0=2	3
Semester			5		Language		Turkish/English	
Course Type	Basic Scientific ☐		Univ. Elective ☒	Technical Elective ☐		Social Elective ☐		
Course Objectives	The aim of this course is to provide an overview of the biogas production technologies from organic wastes and the usage areas of biogas.							
Learning Outcomes and Competencies	Students acquire the ability to explain the basic and main characteristics of renewable energy sources and their differences with fossil fuels. Recognize the effects of existing energy systems based on fossil fuels on the environment and society. Students can make and compare environmental evaluations of biogas energy systems and classical fossil fuel systems. To know what wastes and/or organic materials are suitable for biogas production and can design a suitable biogas system. Students can design biogas / hybrid energy systems to meet specific energy demands.							
Textbooks and References	Boyle, G., Renewable Energy: Power for a Sustainable Future, Oxford University Press, 2004. da Rosa, A.V., Fundamentals of Renewable Energy Processes, Second Edition, Academic Press, 2009.							
ASSESSMENT CRITERIA								
Theoretical Courses				Project Course and Graduation Study				
	If any, mark as (X)	Percent (%)		If any, mark as (X)	Percent (%)			
Midterm Exams	X	40	Midterm Exams					
Quizzes			Midterm Controls					
Homework			Term Paper					
Term Paper, Project Reports, etc.			Oral Examination					
Laboratory Work			Final Exam					
Final Exam	X	60	Other					
Other								
Week	Subjects							
1	History, advantages and disadvantages of biogas production.							
2	Conversion Principles of biogas to energy.							
3	Anaerobic Decay Stages; Hydrolysis, Acid Formation, Methane Formation.							
4	Criteria Affecting Biogas Production; pH, Temperature, etc.							
5	Biogas reactors; types and structures.							
6	Commissioning and process control of Biogas plants							
7	Performance Monitoring of Biogas Production							
8	Anaerobic Reaction Kinetics							
9	Evaluation of biogas production sludge							
10	Process problems and solutions in biogas production							
11	Biogas Production from Wastes							
12	Examples of biogas production from solid wastes							
13	Examples of biogas production from wastewaters							
14	Legislations; Turkey, Europe etc.							
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