

BALIKESIR UNIVERSITY
FACULTY OF ENGINEERING
UNIVERSITY ELECTIVE COURSE PROPOSAL FORM

Department / Program	Environmental Engineering/Environmental Technology					
Course Title	USD0XXX- Energy, Environment and Sustainability					
Semester	Fall			Spring		
Language	Turkish			English		
Credits	Theory	Application		Total		
ECTS	3					
Type of Program	University Elective Course			Normal Education		
Course Objectives	The objective of this course is to enable students to understand energy resources, energy production and consumption processes, renewable energy technologies, and energy efficiency approaches. The course aims to raise awareness of sustainable energy use and to develop a sustainability-oriented engineering perspective considering environmental impacts of energy systems.					
Course Content	The course covers energy types and energy conversion processes, environmental impacts of fossil fuels, renewable energy sources (solar, wind, hydroelectric, biomass, and geothermal), energy efficiency, energy management, carbon footprint, life cycle assessment (LCA), low-carbon energy systems, climate change, and sustainable energy policies.					
Course Prerequisites	No prerequisite required.					
Instructor	Asst. Prof. Dr. Tülay YILMAZ			mail : tulay.yilmaz@balikesir.edu.tr		
Course Assistants	-					
Course Internship Status	No internship required.					
Course Resources						
Course Category	Natural Sciences					
Planned Learning Activities and Methods	Theoretical instruction, midterm exam, final exam.					
Course Evaluation Criteria			Course ECTS Calculation Content			
Semester Studies	Quantity	Contribution (%)	Activity	Quantity	D u r a t i o n	Total Work Load (hour)
Midterm	1	40	Course Lenght	14	2	28
Quiz			Out-of-Class Work Time	14	1	14
Research Homework			Homework	1	20	20
Continuation			Semester Project	1	20	20
Application			Total Work Load : 82			
Project			ECTS Credits : 3			
Semester Final Exam	1	60				

Learning Outcomes	1. Explains energy types and energy conversion processes. 2. Compares environmental impacts of fossil and renewable energy sources. 3. Analyzes the carbon footprint of energy systems at a basic level. 4. Understands the importance of life cycle assessment (LCA) in energy systems. 5. Applies principles of energy efficiency and sustainable energy management. 6. Evaluates the relationship between energy systems and climate change. 7. Develops basic solutions for low-carbon and sustainable energy systems.		
Course Topics			
Week	Topic	Pre-Study	Materials
1	Introduction to energy and basic concepts	Preliminary Research on the Relevant Topic	Course Resources and Presentations
2	Energy resources and classification		
3	Fossil fuels and environmental impacts		
4	Renewable energy: solar and wind energy		
5	Hydropower, biomass, and geothermal energy		
6	Energy conversion processes and basic efficiency concepts		
7	Midterm Exam		
8	Energy efficiency and energy management		
9	Carbon footprint and greenhouse gas emissions		
10	Life cycle assessment (LCA) in energy systems		
11	Low-carbon energy systems		
12	Energy and climate change relationship		
13	Circular economy and energy recovery		
14	Sustainable energy policies and global approaches		
15	Sustainable Development Goals (SDGs) and energy transition		
Contribution of the Course to Program Outcomes	This course makes a high-level contribution particularly to the program outcomes related to sustainability awareness, environmental protection approaches, and the efficient management of water resources. Students gain the ability to analyze current environmental problems such as water scarcity, water stress, and water management, and develop problem-solving and engineering approaches. In addition, by evaluating domestic, agricultural, and industrial water use, students develop interdisciplinary thinking skills. The course supports the adoption of environmental awareness, professional responsibility, and sustainable living principles, contributing at both moderate and high levels to the program outcomes.		