

ETM 517 Renewable Energy Technologies

SYLLABUS

Semester: 2020-2021 Fall
Type of Course: "Energy Technologies and Management" Executive Master
Program Students

Lecture Date / Time: Friday– 19.00-21.45, Saturday: 9.00-11.45

Location: Minerva Han, Karaköy

Lecturers: Mr. Ömer Emre Orhan

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Course Description and Contents:

General details about wind, solar and hydro energy will be discussed. The aim is to give an overview about these renewable energy sources. This will form a basis for more detailed discussion that will be covered in the advanced version of the course.

Wind Energy Technology and Systems

- How wind is formed?
- Details of Wind Measurement Systems
- Wind statistics and data analysis
- Details of Wind Resource Assessment
- Aerodynamics of Wind turbines
- Wind turbine technology

Solar Energy Technology and Systems

- Photoelectric effect
- Solar cells and modules
- Details of PV projects
- Solar measurements
- Solar resource assessment

Hydroelectric Energy Technology and Systems

- Fundamentals of Hydraulics
- Hydrology
- Hill Charts and design principles of hydro turbines
- Hydraulic Structures
- Hydraulic Turbines
- Hydroelectric Power Plants

Geothermal Energy Technology and Systems

- Geology
- Geothermal Resource
- Geothermal Exploration
- Geothermal Well Drilling
- Reservoir Modeling and Simulation
- Geothermal Power Plants
- Environmental Effects
- Power Plants in Turkey

Biogas/Bioenergy Energy Technology and Systems

- Bioenergy market in Turkey and in the world
- Introduction to Bioenergy
- Conversion Processes
- Bioenergy systems
- Bioenergy power plants
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General Overview and Future of Renewable Energy

- Current trends in Renewable Energy
- Integration of Renewable Energy into the Grid
- Fundamentals of Ocean Energy

Lecture Planning

GÜZ / II. Yarı			ETM 517 Renewable Energy Systems (Cmtesi: 09.00-11.45, Cuma: 19.00-21.45)	
			Konu Başlığı	Eğitmen
8.HAFTA	24 Kasım	Cumartesi	BİRİNCİ TEKNİK GEZİ	
	30 Kasım	Cuma		
9.HAFTA	1 Aralık	Cumartesi	Current Trends in Renewable Energy Systems	Ömer Emre Orhan
	7 Aralık	Cuma	Wind Measurements	Ömer Emre Orhan
10.HAFTA	8 Aralık	Cumartesi	Wind Statistics and Data Analysis	Ömer Emre Orhan
	14 Aralık	Cuma	Wind Energy Assessment	Ömer Emre Orhan
11.HAFTA	15 Aralık	Cumartesi	Wind Energy Aerodynamics	Ömer Emre Orhan
	20 Aralık	Perşembe	Wind Turbine Technology	Ömer Emre Orhan
12.HAFTA	28 Aralık	Cuma	Photoelectric effect and Solar Angles	Ömer Emre Orhan
	29 Aralık	Cumartesi	Fundamentals of Solar Cells and Solar Technology	Ömer Emre Orhan
13.HAFTA	4 Ocak	Cuma	From Cell to Module and Manufacturing of Solar	Ömer Emre Orhan
	5 Ocak	Cumartesi	Development of PV Projects	Ömer Emre Orhan
14.HAFTA	9 Ocak	Çarşamba	Fundamentals of Hydro Power, Hydrology, Mechanical	Ömer Emre Orhan
	11 Ocak	Cuma	Hydraulic Turbines, Hill Charts, Auxiliary Systems	Ömer Emre Orhan
	12 Ocak	Cumartesi	Fundamentals of Geothermal Power	Ömer Emre Orhan
	12 Ocak	Cumartesi	Fundamentals of Bioenergy (biomass, biogas)	Ömer Emre Orhan

Course Assessment and Expectations from Students:

- The in-class learning and participation performance of students are going to be evaluated at the end of each lecture, through a quiz exam comprising 5-6 questions about the most critical discussion topics and information from the lecture.

Readings:

There is no main textbook for the course. Reading lists for each lecture topics will be sent by the relevant lecturer.