

Ankara Üniversitesi
Kütüphane ve Dokümantasyon Daire Başkanlığı
Açık Ders Malzemeleri

Ders izlence Formu

Dersin Kodu ve İsmi	CEN 4481 Carbon Materials for Energy Storage and Conversion Systems
Dersin Sorumlusu	Dr. İ. Işıl GÜRTEN İNAL
Dersin Düzeyi	Lisans
Dersin Kredisi	3
Dersin Türü	Teorik
Dersin İçeriği	<p>Carbon materials have been playing a significant role in the development of alternative clean and sustainable energy technologies due to their unique electrical properties and tailored porous structure. This course summarizes the structural properties and classification of carbon materials, recent techniques on the synthesis of porous carbons and their application in energy storage and conversion. In particular, we will systematically discuss the porous structure, surface chemistry and electrical properties of carbons as electrode materials for supercapacitors, lithium-ion batteries, fuel cells, and other energy conversion devices. The common challenges in developing simple, scalable, and environmentally friendly carbon materials and manufacturing processes, in controlling the nanoscale and high level structures and functions, and in integrating such materials with suitable device architectures will be reviewed. Recent application in the area will be also discussed.</p>
Dersin Amacı	<p>The aim of this course is to give a thorough understanding chemical engineering students of the current situation of the energy storage and conversion systems in the global economy. The module will address the classification, structural properties (surface, morphological and electrochemical) and production techniques of carbon materials that are used in the energy storage and conversion systems. The module will provide detailed information about the usage of carbon materials in Li-ion batteries, supercapacitors, fuel cells and the fundamental working principals of those systems. The module will also provide a thorough understanding of 'design and characterisation of carbon materials' for those systems. Evaluation of the electrochemical performance of a carbon material as electrode material in an energy storage device using the real experimental is also aimed. Finally, the current technology, improvements and the future challenges will be discussed.</p>
Dersin Süresi	14 hafta
Eğitim Dili	İngilizce
Ön Koşul	Yok
Önerilen Kaynaklar	<ol style="list-style-type: none">1. François Beguin, Elzbieta Frackowiak, Carbon for Electrochemical Energy Storage and Conversion Systems, CRC Press, 2010.2. Xinliang Feng, Nnancarbon for Advanced Energy Storage-Volume 1, Wiley-VCH, 2015.3. A.Rashid bin Mohd Yusoff, Graphene-based Energy Devices, Wiley-VCH, 2015.4. E. Frackowiak, F. Béguin, Carbon materials for the electrochemical storage of energy in capacitors, Carbon 39 (6) (2001) 937-950.5. A. Pandolfo, A. Hollenkamp, Carbon properties and their role in supercapacitors, J. Power Source 157 (1) (2006) 11-27.6. James Mitchell Crow, Wearable Technology, Chemistry World, 14 (5) (2017) 16-19.
Dersin Kredisi (AKTS)	5
Laboratuvar	-
Diğer-1	