ENERGY & SUSTAINABILITY, MINOR

The minor in Energy and Sustainability provides students with broad coverage of technical and societal issues in energy and sustainability. It is designed to help students become leaders in developing technologies for a more sustainable energy future.

SEAS Second Major or Minor Option

Students interested in a second major (College students only) or minor with SEAS are required to meet with the Undergraduate Curriculum Chair from the major/minor department you wish to declare to discuss requirements and obtain approval on the Second Major or Minor form. The approved form must be returned to the SEAS Research and Academic Services Office, 109 Towne Building.

For more information: http://www.seas.upenn.edu/undergraduate/degrees/minor-energy.php

Energy and Sustainability Minor (ENSU)

Students participating in the minor are expected to have taken at least one semester of intro chemistry, mathematics and physics.

Code	Title	Course Units
Fundamental Engineering Science		
Engineering Thermodymanics		
Select one of the following:		1
CBE 230	Material and Energy Balances of Chemical Processes	
CBE 231	Thermodynamics of Fluids [1]	
MEAM 203	Thermodynamics I	
MSE 260	Energetics of Macro and Nano-scale Materials	
Basic Principles in Solid State Physics		
MSE 221	Quantum Physics of Materials	1
or ESE 321	Physics and Models of Semiconductor Devices	
Energy and Sustainability Systems & Technology		
ENGR 250	Energy Systems, Resources and Technology	1
Energy and Sustainability Policy, Regulation and Societal Impact		
Select one of the following:		1
EAS 301	Climate Policy and Technology	
EAS 306	Electricity and Systems Markets	
EAS 401	Energy and Its Impacts: Technology, Environment, Economics, Sustainability	
EAS 402	Renewable Energy and Its Impacts: Technology, Environment, Economics, Sustainability.	
EAS 403	Energy Systems and Policy	
Energy and Sustainability Electives		
Select 2-3 course units of the following:		2-3
CBE 375	Engineering and the Environment	
CBE 545	Electrochemical Energy Conversion and Storage.	
CBE 546	Fundamentals of Industrial Catalytic Processes	
ENGR 503	Engineering in Oil, Gas and Coal, from Production to End Use	
CBE 543	Sust Dev/Water Res Sys	
ESE 521	The Physics of Solid State Energy Devices	
MEAM 503	Direct Energy Conversion: from Macro to Nano	
MSE 545	Materials for Energy and Environmental Sustainability	
MEAM 502	Energy Engineering in Power Plants and Transportation Systems	
Total Course Units		6

[1] Of the two CBE courses, CBE 231 Thermodynamics of Fluids is prefferred.

The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2018 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.