

# Sustainable Energy Systems, Minor

The sustainable energy systems minor is an interdisciplinary selection of courses designed to offer flexibility and exposure to the principles and applications of sustainable energy systems that are needed to meet the challenges of the world's growing energy needs. Students have an opportunity to learn technical skills, analysis techniques, design strategies, and principles of economics and energy policy in topic areas including traditional (fossil fuel), alternative, renewable, and sustainable energy sources and energy system applications.

## Minor Requirements

Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified.

*Note:* Courses required to fulfill a major requirement may not be used to fulfill minor requirements. However, one engineering course from this minor with course number 4000 to 5999 in the student's major can be used as a technical elective or advanced engineering elective to fulfill the student's major requirements. See curriculum below for details.

## Core Energy Science, Technology Courses

Code	Title	Hours
Complete two of the following:		8
CHME 2320 or ME 2380	Engineering Thermodynamics Thermodynamics	
EECE 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage	
ENSY 5000	Fundamentals of Energy System Integration	
GE 3300	Energy Systems: Science, Technology, and Sustainability	

## Environmental/Economics/Policy Courses

Code	Title	Hours
Complete one of the following:		4
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure	
ECON 3423	Environmental Economics	
ECON 3425	Energy Economics	
ENVR 2515	Sustainable Development	
FINA 2720	Sustainability in the Business Environment	

## Electives

Code	Title	Hours
Complete two of the following:		8
CHME 2308	Conservation Principles in Chemical Engineering	
CHME 2320	Engineering Thermodynamics	
CHME 5630	Biochemical Engineering	
CHME 5699	Special Topics in Chemical Engineering	
CIVE 4566	Design for Sustainable Transportation: Netherlands	
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure	
EECE 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage	
EECE 5680	Electric Drives	
EECE 5682	Power Systems Analysis 1	
EECE 5688	Analysis of Unbalanced Power Grids	
ENSY 5000	Fundamentals of Energy System Integration	
GE 3300	Energy Systems: Science, Technology, and Sustainability	
IE 4512	Engineering Economy (IE students may not count this course toward a sustainable energy minor if used to fulfill a major requirement.)	
ME 2380	Thermodynamics	
ME 5685	Solar Thermal Engineering	
SBSY 5100	Sustainable Design and Technologies in Construction	
SBSY 5200	Sustainable Engineering Systems for Buildings	

## **GPA Requirement**

2.000 GPA required in the minor

Details about double-counting restrictions between this minor and Engineering major requirements are as follows:

- Civil engineering, environmental engineering and environmental engineering/health science students may not count Energy Systems: Science, Technology, and Sustainability (GE 3300) toward the sustainable energy systems minor if this course is used to fulfill major requirements.
- Chemical engineering students and mechanical engineering students may not count Engineering Thermodynamics (CHME 2320) or Thermodynamics (ME 2380) toward the sustainable energy systems minor since these courses are required in their respective majors.
- Chemical engineering students may not count Conservation Principles in Chemical Engineering (CHME 2308) toward the sustainable energy systems minor since this course is required in their major.
- Industrial engineering students may not count Engineering Economy (IE 4512) toward the sustainable energy systems minor since this course is required in their major.