

Energy systems

ENERGY SYSTEMS – ENSYS

Despina Prapavessi, Dean
 Mathematics and Engineering Division
 Mathematics Building, Room 267

Possible career opportunities

An area of increasing job opportunities is in the various fields of alternate or renewable energy. This includes areas related to solar photovoltaics, solar water heating, wind energy systems, biodiesel and biofuels, biomass, fuel cells and related hydrogen energy devices and other small technologies. Most of the jobs in these areas are involved with the installation, design or maintenance of these systems. Most of these areas require skills in electricity, science, and math.

Associate in science degree

Energy systems

Students completing the program will be able to...

- A. identify, measure, and analyze the major energy uses in typical businesses operations, focusing beyond the building and into processes.
- B. demonstrate the electrical and energy systems skills to successfully interact with builders, architects, engineers, and constructors and advise on building and systems energy use.
- C. design medium complexity solar photovoltaic or other energy system for medium size commercial buildings and processes.

This program provides students with a broad view of energy and energy systems and specific skills for those planning on entering the field designing, installing, servicing/repairing and maintaining renewable/sustainable energy systems. This includes wind energy, biodiesel and biofuels, biomass, fuel cells, hydrogen, and other technologies.

To earn an associate in science degree, students must complete each course used to meet a major requirement with a "C" grade or higher, maintain an overall GPA of 2.5 or higher in the coursework required for the major and complete general education requirements as listed in the catalog.

<i>major requirements:</i>	<i>units</i>
ENSY-120 Introduction to Energy Systems	3
ENSY-125 Building Envelope and Systems	3
ENSY-130 Photovoltaic Systems Design and Installation	2
ENSY-230 Advanced Photovoltaic Systems	2

plus at least 4 units from:

ELECT-120 Direct Current Circuits	4
ELTRN-120 Direct Current Circuits	4

plus at least 12 units from:

ARCHI-207 Environmental Control Systems	3
CONST-110 Occupational Safety.....	2
CONST-183 Title 24: Energy Conservation Codes	3
ELECT-121 Alternating Current Circuits	4
ELECT-266 Electrical Codes: Articles 90-398	3
ELECT-267 Electrical Codes: Articles 400-830.....	3
total minimum required units	26

Certificate of achievement

Energy systems

Students completing the program will be able to...

- A. identify, measure, and analyze the major energy uses in typical businesses operations, focusing beyond the building and into processes.
- B. demonstrate the electrical and energy systems skills to successfully interact with builders, architects, engineers, and constructors and advise on building and systems energy use.
- C. design medium complexity solar photovoltaic or other energy system for medium size commercial buildings and processes.

This program provides students with a broad view of energy and energy systems and specific skills for those planning on entering the field designing, installing, servicing/repairing and maintaining renewable/sustainable energy systems. This includes wind energy, biodiesel and biofuels, biomass, fuel cells, hydrogen, and other technologies.

To earn a certificate of achievement, students must complete each course used to meet a certificate requirement with a "C" grade or higher and maintain an overall GPA of 2.5 or higher in the coursework required for the certificate.

<i>required courses:</i>	<i>units</i>
ENSY-120 Introduction to Energy Systems	3
ENSY-125 Building Envelope and Systems	3
ENSY-130 Photovoltaic Systems Design and Installation	2
ENSY-230 Advanced Photovoltaic Systems	2

plus at least 4 units from:

ELECT-120 Direct Current Circuits	4
ELTRN-120 Direct Current Circuits	4

plus at least 12 units from:

ARCHI-207 Environmental Control Systems	3
CONST-110 Occupational Safety.....	2
CONST-183 Title 24: Energy Conservation Codes	3
ELECT-121 Alternating Current Circuits	4
ELECT-266 Electrical Codes: Articles 90-398	3
ELECT-267 Electrical Codes: Articles 400-830.....	3
total minimum required units	26

Energy systems

Certificate of accomplishment

Energy systems

Students completing the program will be able to...

- A. identify, measure, and analyze the major energy uses in typical businesses operations, focusing beyond the building and into processes.
- B. demonstrate the electrical and energy systems skills to successfully interact with builders, architects, engineers, and constructors and advise on building and systems energy use.
- C. design medium complexity solar photovoltaic or other energy system for medium size commercial buildings and processes.

This program provides students with a broad view of energy, energy systems, and specific entry-level skills for those planning on entering the field of installing, servicing/repairing, and maintaining renewable/sustainable energy systems with a focus on photovoltaic systems. Technologies include wind energy, biodiesel and biofuels, biomass, fuel cells, hydrogen, and other technologies.

To earn a certificate of accomplishment, students must complete each course used to meet a certificate requirement with a "C" grade or higher and maintain an overall GPA of 2.5 or higher in the coursework required for the certificate.

<i>required courses:</i>	<i>units</i>
ENSY-120 Introduction to Energy Systems	3
ENSY-125 Building Envelope and Systems	3
ENSY-130 Photovoltaic Systems Design and Installation	2
ENSY-230 Advanced Photovoltaic Systems	2

<i>plus at least 4 units from:</i>	
ELECT-120 Direct Current Circuits	4
ELTRN-120 Direct Current Circuits	4
total minimum required units	14

ENSY-120 Introduction to Energy Systems

3 units SC
• 45 hours lecture/27 hours laboratory per term

This course provides an introduction to energy and energy conversion systems and examines issues related to the sustainability of each system. Renewable energy sources, such as hydro, wind, and solar as well as geothermal, fuel cells, and nuclear are examined. The use and impacts of traditional energy resources such as fuels, wood, coal, oil, and natural gas are also discussed. Energy policy, efficiency, conservation, storage, climate change, and demand side management are also examined. CSU

ENSY-125 Building Envelope and Systems

3 units SC
• 45 hours lecture/27 hours laboratory per term
• Advisory: ENSY-120 or Equiv. and MATH-085 or MATH-085SP or beginning algebra or equivalents

This course provides an introduction to buildings and building systems, including the envelope and major electro-mechanical equipment used in the building. Students will gain knowledge of and experience with various strategies and tools used to measure and analyze building energy use such as infrared thermography, duct and envelope leak testers, light and sound meters, energy analysis programs. Mitigation strategies to save energy and improve occupancy health are emphasized. CSU

ENSY-130 Photovoltaic Systems Design and Installation

2 units SC
• 36 hours lecture/18 hours laboratory per term

This course presents an introduction to the theory, application, installation, and operation of photovoltaic systems. Topics include performance of solar site evaluations, calculation of electrical loads, sizing panel arrays, and techniques for installation of photovoltaic systems. This course is approved by the North American Board of Certified Energy Practitioners (NABCEP) and upon completion of the course, students will be eligible to sit for the Photovoltaic Systems Associate certification exam. CSU

ENSY-150 Topics in Energy Systems

.3-4 units SC
• Variable hours

A supplemental course in energy systems that provides a study of current concepts and practices in energy systems and related subdivisions. Specific topics will be announced in the schedule of classes. CSU

ENSY-230 Advanced Photovoltaic Systems

2 units SC
• 27 hours lecture/27 hours laboratory per term
• Advisory: ENSY-130 or equivalent

This course presents intermediate and advanced theories and skills for photovoltaic systems. Topics include installation, maintenance, evaluation, troubleshooting, and repair of commercial photovoltaic systems, including application of all applicable codes. CSU

ENSY-299 Student Instructional Assistant

.5-3 units SC
• Variable hours
• Note: Applications must be approved through the Instruction Office. Students must be supervised by a DVC instructor.

Students work as instructional assistants, lab assistants and research assistants in this department. The instructional assistants function as group discussion leaders, meet and assist students with problems and projects, or help instructors by setting up laboratory or demonstration apparatus. Students may not assist in course sections in which they are currently enrolled. CSU