



# GREEN BUILDING AND RENEWABLE ENERGY

## About the certificate program

The *Green Building and Renewable Energy Certificate Program* combines elements from architecture, civil engineering, landscape architecture, environmental and land use planning, construction management and renewable energy systems design to provide in-depth technical training in the treatment of renewable energy systems design.

## How you will benefit

Complementing the policy, planning and design emphasis of the *Green Building and Sustainable Design Certificate Program*, this program delves deeper into the treatment of renewable energy systems design. Learn to develop successful strategies for implementation of green building and sustainability in site planning and design, building design, and construction management practices. Gain the body of knowledge associated with green building and sustainable design principles and prepare for LEED certification.

## Who should attend

This program is designed for professionals who want to advance their knowledge and careers in the planning, design, engineering, renewable energy systems and construction disciplines, including: construction managers, first line supervisors, architects, architectural drafters, civil and mechanical engineers, interior designers, urban and regional planners, developers, builders and landscape architects.

## For more information

For more information about the *Green Building and Renewable Energy Certificate Program*, please call (800) 752-0881, email [extension@ucdavis.edu](mailto:extension@ucdavis.edu) or visit our Web site.

[www.extension.ucdavis.edu/greenbuilding](http://www.extension.ucdavis.edu/greenbuilding)



Course descriptions  
and quarterly schedule .....  
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**EXTENSION**

CONTINUING AND PROFESSIONAL EDUCATION

The **Green Building and Renewable Energy Certificate Program** is comprised of eight required courses and elective courses for a total of 17 quarter units.



## Sustainability and the Built Environment

2 quarter units academic credit.

Receive an overview of sustainability, as it relates to the built environment—from the economic, environmental and social-equity development perspectives. Learn how researchers and analysts define sustainability, as well as how they measure and track progress. Study historical precursors of the current sustainability movement, and how this movement is translated into planning, engineering, architecture, landscape architecture, construction and other fields. Participate in group discussions led by professionals currently engaged in sustainable building practices. Large-scale planned communities, infill sites and individual structures from the U.S. and other nations, as well as how these buildings are serviced and managed are highlighted. Learn how to examine planning, design and building problems holistically, contrasting “cradle to cradle” lifecycle analyses (economic and environmental) against the long-term costs of traditional development approaches.

## Energy Sources, End Uses and Impacts

2 quarter units academic credit.

End uses—the breakdown of how energy is used in its final stage—is a crucial component of a successful sustainable environment. This course will address the energy issues from the macro perspective of the built environment to the micro approach of how heat flows through a building. Using the “whole building” perspective, learn about some of the natural and mechanical means of heating, cooling and ventilation for improved indoor air quality and cost savings. From solar panels and exterior shades to lighting a space and painting a roof white, learn how to analyze energy use as an effective strategy to promote energy conservation in the built environment.

## Solar Energy Systems Design

2 quarter units academic credit.

Learn the basics of solar photovoltaic power systems for both residential and commercial systems, as well as solar system physics and technology, design and implementation. Examine energy conservation, the economics of solar power systems, passive solar heating systems, the California Solar Initiative and LEED Review. Work with other participants to design a solar energy system for residential and commercial purposes. Gain the practical skills needed to design a solar power system for your home or business.



## Small Wind Energy Systems

2 quarter units academic credit.

Learn the basics of small wind energy systems engineering for residential and commercial applications. Examine small wind systems types and components, economic issues, public concerns, installation, safety, operation and maintenance criteria. Study wind measurement, energy output estimates, wind system selection and siting criteria. Work in teams to select and site a small wind energy system for a residential or commercial application.

## Cogeneration and District Solutions

1 quarter unit academic credit.

Gain an overview of micro cogeneration and district energy solutions for commercial and district applications. Learn about cogeneration system selection and sizing, preliminary feasibility study approaches, heat to power ratios, computer programs, economic and environmental issues, emerging technologies and regulations.

## Bioenergy Systems Design

2 quarter units academic credit.

Receive an introduction to bioenergy systems to produce biofuels and power generation. Gain an understanding of biomass technologies and characteristics, engineering bioenergy feedstocks, biochemical conversion, anaerobic digestions, thermochemical and physicochemical conversion, biomass production systems and feedstock logistics. Explore the environmental, economic and social impacts. Learn about emerging bioenergy technologies, legislation and regulations. Work in teams to design and site a bioenergy system for a commercial or agricultural application.

## Geothermal Energy Systems Design

2 quarter units academic credit.

Learn the basics of geothermal energy systems design in both residential and commercial applications. Explore direct use applications and requirements, planning and design. Particular attention is paid to the theory, design and installation of ground source heat pump systems and how the innovative use of these systems have benefited homes, schools, hospitals and municipalities. Work in teams to design and site a geothermal energy system for a commercial or residential application.

## Green Building Case Studies/Studio

2 quarter units academic credit.

This final course in the program serves as a capstone and relies heavily on comparative case studies, examining the issues covered in previous courses, using actual examples of building projects completed. This course requires an interdisciplinary and capstone project in a studio environment.

Courses can be taken individually or as part of the *Green Building and Renewable Energy Certificate Program*.

QUARTERLY SCHEDULE OF COURSES	UNITS	F	W	SP	SU
<b>REQUIRED COURSES (15 units)</b>					
Sustainability and the Built Environment	2	■			
Energy Sources, End Uses and Impacts	2			■	
Solar Energy Systems Design	2	■			
Small Wind Energy Systems	2	■			
Cogeneration and District Solutions	1		■		
Bioenergy Systems Design	2		■		
Geothermal Energy Systems Design	2			■	
Green Building Case Studies/Studio	2				■
<b>ELECTIVE COURSES (2 units)</b>					

All courses in the Land Use and Natural Resources or Construction Management programs may apply with prior approval.

Schedules are subject to change. Check our Web site for the latest schedule and course information: [www.extension.ucdavis.edu](http://www.extension.ucdavis.edu) or call (800) 752-0881.